

January 28, 2003

56910 002

Mr. Thomas Anderson
PAI/ISSi
NASA Ames Research Center, MS 19-21
Moffett Field, California 94035-1000

**Lead Impacted Soil Sampling and
Removal Action Workplan Implementation
Initial Soil Sample Results
NASA Research Park
Moffett Field, California**

Dear Mr. Anderson:

This report presents the results of soil sampling performed by MACTEC Engineering and Consulting, Inc. (MACTEC; formerly known as Harding ESE, Inc.) for PAI/ISSi at the National Aeronautics and Space Administration (NASA) Research Park (NRP), Moffett Field, California. The intent of this investigation was to assess the levels of lead in soil from lead-based paint (LBP) at the NASA NRP, Moffett Field, California (Site; Plate 1). MACTEC conducted this assessment and prepared this report under contract to PAI/ISSi on behalf of the NASA Ames Research Center.

Background

In July 2002, Harding ESE, prepared *Lead Impacted Soil Summary Report and Sampling and Removal Action Workplan, NASA Research Park, Moffett Field, California (Harding ESE, 2002)* to summarize previous LBP in soil data collected by others at the NRP. That document also presented the following:

- A description of additional soil sampling activities (Initial Soil Lead Assessments) for those buildings where the presence of LBP in the building materials is suspected or confirmed
- An outline of removal action activities for areas where previous data has confirmed the presence of LBP in soil
- The process and protocols to be utilized for the Initial Soil Lead Assessment.

The objective of the Workplan was to identify and develop removal procedures for soil that contains lead exceeding the San Francisco Regional Water Quality Control Board (SFRWQCB) risk-based screening level (RBSL) and to confirm that this cleanup level is not exceeded after soil removal activities. Based on a residential land use scenario, the RBSL for lead in surface soils (<3 meters (m) in depth) used for NRP is 200 milligrams per kilogram (mg/kg).

On the basis of the review of previous data, MACTEC identified multiple buildings/areas where lead-impacted soils were identified or suspected. On October 24, 2001, Harding ESE conducted a site visit

to inspect these buildings/areas and to identify those that were surrounded by soil. Buildings/areas surrounded by paved surfaces were not included for soil lead assessments. The areas identified for initial soil lead assessments are the pre-1978 buildings with the potential for lead based paint (*Harding ESE, 2002*). The sampling locations are shown on Plates 2 through 12. In addition, a building/area's previous use was also considered. For example, Building 38 (Area 2, Parcel 1) is and has historically been tennis courts. Therefore, LBP impacts were not suspected and sampling was not recommended.

Field Investigation

MACTEC collected samples from the Site on September 17 and 18, 2002, in accordance with protocols outlined in the workplan. The samples were collected using a stainless steel trowel and immediately transferred to clean four-ounce glass jars. The soil assessment included collecting a suite of composite samples in unpaved areas at the building corners, near suspect discharge points such as downspouts, and at regular intervals around the periphery of the building. The sampling grid consisted of six samples collected from cells up to 30-feet long by 20-feet wide. Samples were collected from 0 to 6 inches below the surface at the dripline or no more than 2-feet from the building wall if the dripline was not apparent.

Six samples per cell were collected and the samples from each cell were thoroughly mixed and composited in accordance with ASTM Standard D-6051-96 (*ASTM, 1996*). The samples were labeled and transported under chain of custody procedures to a state-certified analytical laboratory for total lead analysis by EPA Test Method 6010. Samples with total lead concentrations greater than 50 mg/kg were also analyzed for leachable lead using the Waste Extraction Test (WET) method in accordance with the Workplan.

Upon inspection of the site and discussion with Mr. Tom Anderson of PAI/ISSi, ten building locations were established and sampled. Several sites were eliminated from the original sampling program due to the soil bed being a veneer of soil over an asphaltic concrete (AC) pavement. One building was a transite roofed open structure on steel poles above a recreational barbecue area. Two additional building locations, Area 10 buildings 512C and 547B were added by request. Sampling locations are shown on Plates 2 (overview) through 12 and are summarized as follows:

Area 2

Building 24 6 samples

Area 3

Building 943 6 samples

Area 4

Building 510 6 samples

Area 5

Building 29 2 samples (discrete sample and duplicate collected at east side downspout)

Area 6b

Building 3 72 samples

Area 7

Building 533 6 samples

Area 9

Building 113 6 samples (one exposed soil location only)

Area 10

Building 512C 24 samples Area 10

Building 547B 6 samples

Area 11

Building 329 6 samples (samples collected from voids in the AC surfacing where accessible)

Field Investigation

Analytical Results

Table 1 summarizes the total lead results of the soil composites and the corresponding leachable lead results for samples yielding results greater than or equal to 50 mg/kg total lead. The analytical reports and chain of custody documentation are presented in Appendix A.

MACTEC's evaluation of the analytical data is summarized as follows:

- With the exception of the sample collected from Building 113, Area 9, all total lead results were below the 200 mg/kg RBSL. Lead was detected at a concentration of 990 mg/kg in the sample collected from Building 113. Lead was detected in the remainder of the samples at concentrations between 14 and 170 mg/kg.
- Samples from 22 locations (Building 3 [11 locations and one duplicate sample], Building 24 [original and duplicate samples], Building 29 [original and duplicate samples], Building 113, Building 329, Building 510, Building 512C, Building 533, and Building 943) exceeded 50 mg/kg and were analyzed for leachable lead using the WET method.
- The leachable lead results for samples from Building 3 (East side of building, north end 1st inset), Building 29 (original and duplicate samples), Building 113 and Building 510) were at or above the STLC threshold of 5.0 milligrams per liter (mg/L) as cited in Title 22, California Code of Regulations. It should be noted that the sample location at Building 29 represents materials washed into the gutters and deposited on the AC surfacing materials surrounding the building and do not necessarily indicate soil concentrations below the AC cover.

Summary

Based on the results of the sampling, soil from the vicinity of Building 113, exceeds the NASA RBSL of 200 mg/kg. Prior to building demolition, soil in the vicinity of this building will require removal and disposal as Class I hazardous waste because the leachable lead concentration exceeded the STLC. Confirmation sampling of soil below the excavated area will need to be performed in accordance with procedures outlined in the Workplan developed for the NRP. All other sample results were below the NASA RBSL and soil at these building locations does not require additional investigation or removal.

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Based on the results of the leachable lead analysis, soil in the vicinity of Buildings 3 (East side of building, north end 1st inset), 29, 113 and 510 has leachable lead concentrations that exceed the STLC threshold of 5.0 mg/L. Because the soil did not exceed the RBSL, it is acceptable for the soil to be left in place. However, if the soil is to be excavated and moved elsewhere, then the soil must be disposed of as a Class I waste because the leachable lead concentrations exceeded the STLC threshold.

Due to the limited nature of the sampling program, it is possible that concealed materials above the RBSL or hazardous waste levels may be present or encountered during excavation or other intrusive activities. If other hazardous materials are discovered during excavation or construction activity, work should cease and NASA soil screening policy and procedures should be implemented to determine the nature and extent of the encountered hazard.

If you have questions or would like additional information, please contact Gary Lieberman at (415) 884-3158

Very truly yours,

MACTEC Engineering and Consulting, Inc.

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MW/GL/kb/KB59306.DOC-NASA

Attachments: Plate 1. Site Vicinity Map
Plate 2. Base Map, Soil/Lead Sampling
Plates 3-12. Sampling Locations
Table 1. Summary of Soil Analytical Results
Appendix. A. Laboratory Analytical Results and Chain of Custody Forms

References

American Society for Testing and Materials (ASTM), 1996. *Guide D6051-96(2001) Standard Guide for Composite Sampling and Field Subsampling for Environmental Waste Management Activities.*

MACTEC Engineering and Environmental Services, Inc. (MACTEC) 2002. *Lead Impacted Soil Summary Report and Sampling and Removal Action Workplan, NASA Research Park, Moffett Field, California.* July 24.

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Table 1.
Summary of Soil Analytical Results
NASA Ames Research Center

Area	Building	Location	MACTEC Sample Number	Sequoia Sample ID	Results: Total Lead mg/kg	Results: Leachable Lead mg/L
		Samples collected from south to north.	020917003050			
Area 6B – Parcel 2	Bldg. 3	North end 2 nd inset (continued)	020917003051	P209467-09 P210470-08	60	1.9
			020917003052			
			020917003053			
			020917003054			
		North side of building, building face. Samples collected from east to west.	020917003055	P209467-10 P210470-09	75	<0.38
			020917003056			
			020917003057			
			020917003058			
			020917003059			
		North side of building, western inset. Samples collected from east to west.	020917003060	P209467-11 P210470-10	60	<0.38
			020917003061			
			020917003062			
			020917003063			
			020917003064			
		West side of building, northern end Samples collected from north to south.	020917003065	P209467-12 NA	14 mg/kg	NA
			020917003066			
			020917003067			
			020917003068			
			020917003069			
		South side of building, west end (face). Samples collected from west to east	020917003070	P209467-13 P210470-11	120	4.6
020917003071						
020917003072						
020917003073						
020917003074						
South side of building, west end inset. Samples collected from west to east	020917003075	P209467-14 P210470-12	91	3.8		
	020917003076					
	020917003077					
	020917003078					
	020917003079					
Area 11 – Parcel 4	Bldg. 329	East side of building. Samples collected from south to north. This building has AC cover on all sides, samples collected from breaks in AC. Sample from northwest corner exposed soil. Sample from southwest corner exposed soil.	020917329091	P209467-15 P210470-13	140	<0.38
			020917329092			
			020917329093			
			020917329094			
			020917329095			
			020917329096			
Area 5 – Parcel 2	Bldg. 29	Downspout accumulation	020917029101 *	P209467-16 P210470-14	90	5.0
		Duplicate: Downspout accumulation	020917029102 *	P209467-17 P210470-15	93	6.4

Table 1.
Summary of Soil Analytical Results
NASA Ames Research Center

Area	Building	Location	MACTEC Sample Number	Sequoia Sample ID	Results: Total Lead mg/kg	Results: Leachable Lead mg/L
Area 9 – Parcel 5	Bldg. 113	North side of building, east end. Samples collected from east to west.	020917113103	P209467-18 P209467-18	990	22
			020917113104			
			020917113105			
		North side of building, west end.	020917113106			
			020917113107			
			020917113108			
Area 7 – Parcel 5	Bldg. 533	West side of building, south end. Samples collected from north to south.	020917533109	P209467-19 P210470-16	58	<0.38
			020917533110			
			020917533111			
			020917533112			
			020917533113			
			020917533114			
Area 10 – Parcel 5	Bldg. 512C	South side of building. Samples collected from west to east.	020917512115	P209467-20 NA	36	NA
			020917512116			
			020917512117			
			020917512118			
			020917512119			
			020917512120			
		East side of building. Samples collected from south to north.	020917512121	P209467-21 P210470-17	85	<0.38
			020917512122			
			020917512123			
			020917512124			
	North side of building. Samples collected from east to west.	020917512125	P209467-22	23	NA	
		020917512126				
		020917512127				
		020917512128				
		020917512129				
	West side of building. Samples collected from north to south.	020917512130	P209467-23	16	NA	
		020917512131				
		020917512132				
		020917512133				
		020917512134				
020917512135						
Area 10 – Parcel 5	Bldg. 547B	East side of building. Samples collected from south to north.	020917547139	P209467-24	25	NA
			020917547140			
			020917547141			
			020917547142			
			020917547143			
			020917547144			
Area 3 – Parcel 1	Bldg. 943	West side of building, north end	020918943145	P209467-25 P210470-18	170	1.0
			020918943146			
			020918943147			
			020918943148			
			020918943149			
		West side of building, south end	020918943150			
Area 2 – Parcel 1	Bldg. 24	QA/QC Duplicate	020917024A (001-006)	P209467-26 P210470-19	160	<0.38

Table 1.
Summary of Soil Analytical Results
NASA Ames Research Center

Area	Building	Location	MACTEC Sample Number	Sequoia Sample ID	Results: Total Lead mg/kg	Results: Leachable Lead mg/L
Area 6B – Parcel 2	Bldg. 3	QA/QC Duplicate	020917003A (031-036)	P209467-27 P210470-20	99	2.0
Area 11 – Parcel 4	Bldg. 329	QA/QC Duplicate	020917329A (091-096)	P209467-28	49	NA

NOTES:

mg/kg milligrams per kilogram, equivalent to parts per million (ppm)

mg/L milligrams per liter, equivalent to parts per million (ppm)

NA Not analyzed by this method

<0.38 Not detected at indicated reporting limit

* Indicates that samples were analyzed discretely, not as a composite.

Sample results are for six-point composites unless otherwise noted.

Samples with total lead concentrations greater than 50 mg/kg were also analyzed for soluble lead.

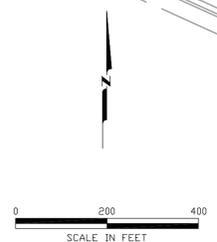
Bolded result indicates exceedance of NASA RBSL.



EXPLANATION

-  Composite Sample Locations (Harding ESE, 2002)
-  Sample locations (CWMI, 1993; Weston, 1998, PAI, 2001a and b), all locations approximate
-  Buildings requiring soil removal
-  Buildings with potential for lead based paint, pre-1978 buildings sampled by Harding ESE, 2002.
-  No lead based paint hazards based on sampling results, post-1978 building construction, or building type/use (Note 1)
- 1** Parcel Number
-  Parcel Boundary
-  Area Boundary

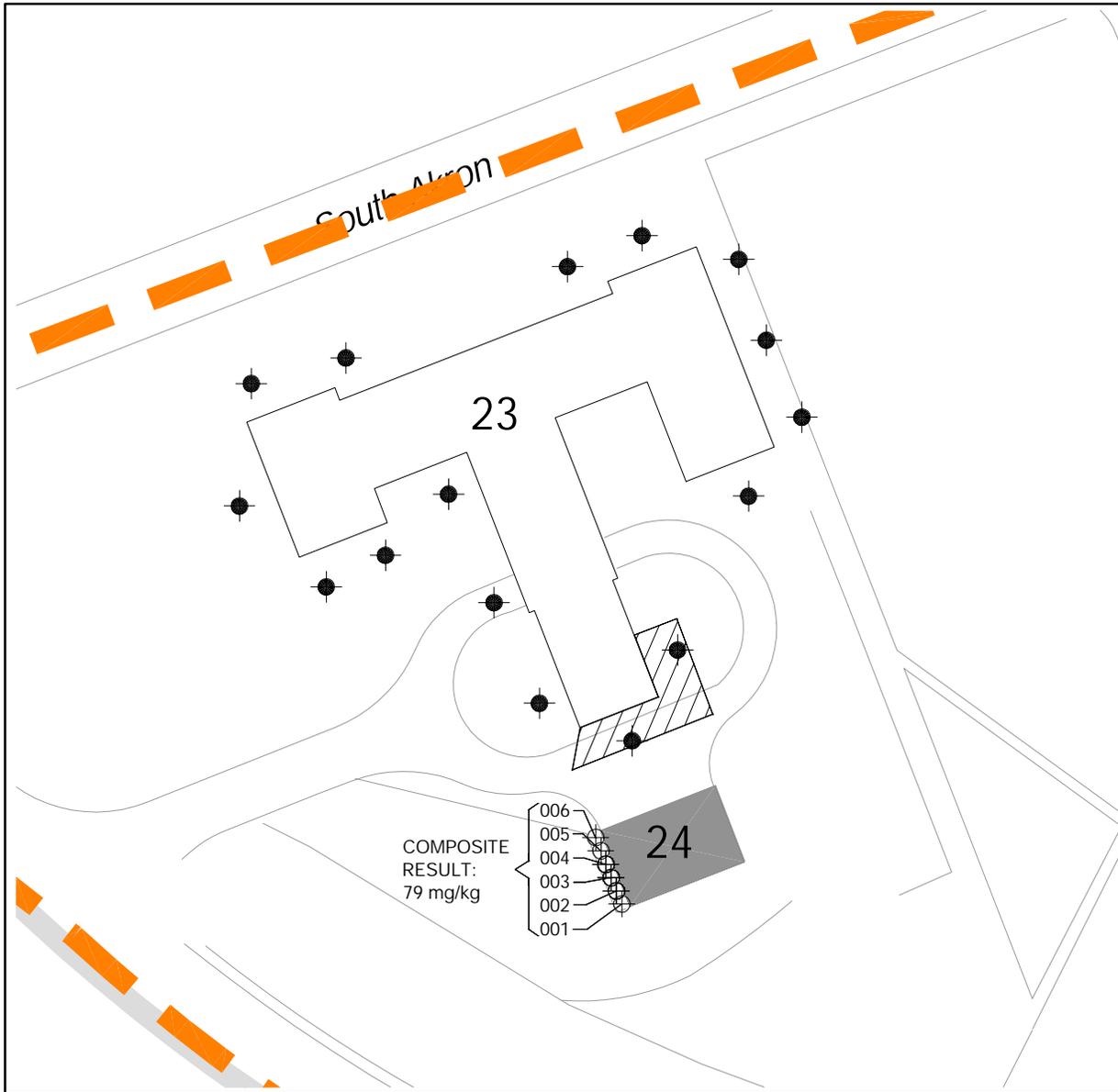
NOTES: 1. Buildings surrounded by concrete were not included in sampling plan and are shown as green.



Base Map
Soil/Lead Sampling
NASA Research Park
Moffett Field, California

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PLATE 2



EXPLANATION

-  Sample locations (Harding ESE, 2002), all locations approximate
-  Sample locations (CWMI, 1993; Weston, 1998), all locations approximate

 Buildings with potential for lead based paint, pre-1978 buildings sampled by Harding ESE, 2002.

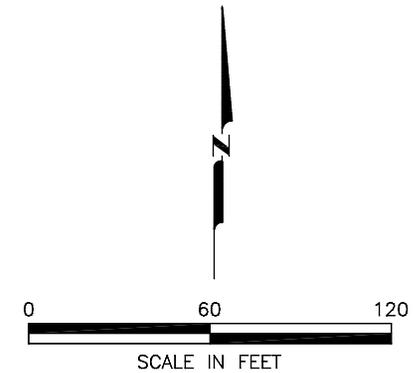
 No lead based paint hazards based on sampling results, post-1978 building construction, or building type/use.

 Approximate area to be excavated

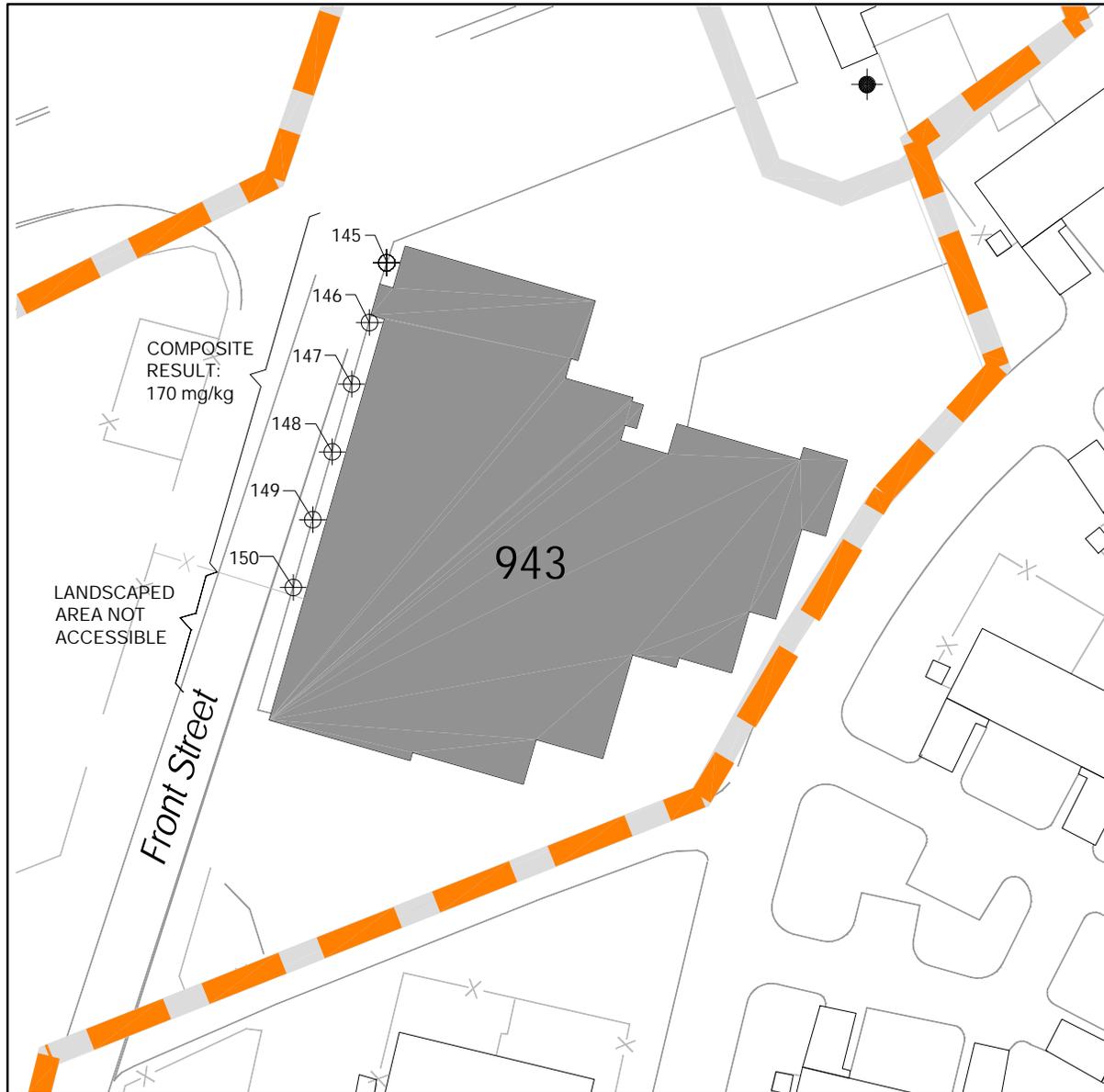
 Parcel Boundary

 Area Boundary

Total lead results in milligrams per kilogram (mg/kg)



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1.0



EXPLANATION

⊕ Sample locations (Harding ESE, 2002), all locations approximate

● Sample locations (CWMI, 1993; Weston, 1998), all locations approximate

▒ Buildings with potential for lead based paint, pre-1978 buildings sampled by Harding ESE, 2002.

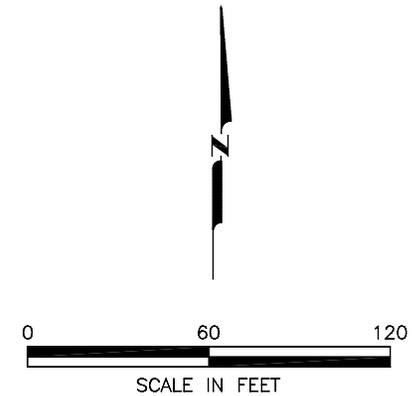
■ No lead based paint hazards based on sampling results, post-1978 building construction, or building type/use.

▨ Approximate area to be excavated

— Parcel Boundary

— Area Boundary

Total lead results in milligrams per kilogram (mg/kg)



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PLATE



Harding ESE
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Sampling Locations
Buildings 943 (Area 3)
Lead Sampling
NASA Research Park
Moffett Field, California

4

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JOB NUMBER
56910 002

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10/01

REVISED DATE



EXPLANATION

- Sample locations (Harding ESE, 2002), all locations approximate
- Sample locations (CWMI, 1993; Weston, 1998), all locations approximate

Buildings with potential for lead based paint, pre-1978 buildings sampled by Harding ESE, 2002.

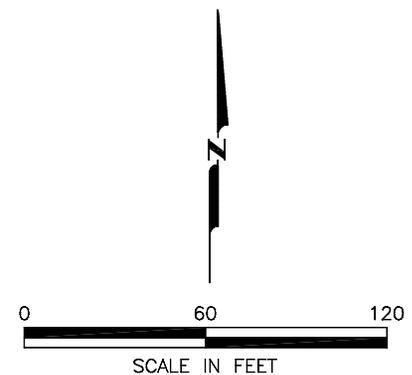
No lead based paint hazards based on sampling results, post-1978 building construction, or building type/use.

Approximate area to be excavated

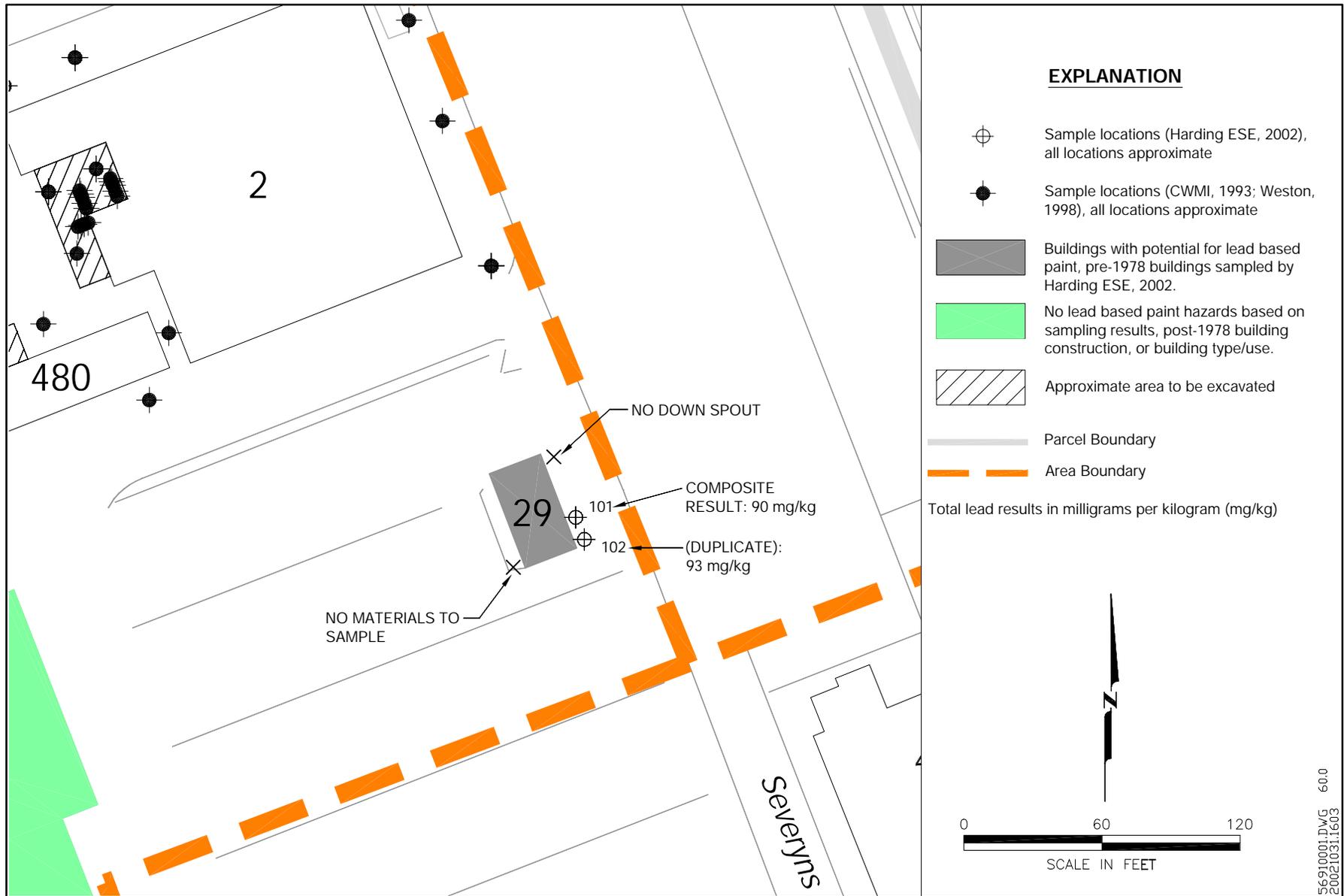
Parcel Boundary

Area Boundary

Total lead results in milligrams per kilogram (mg/kg)

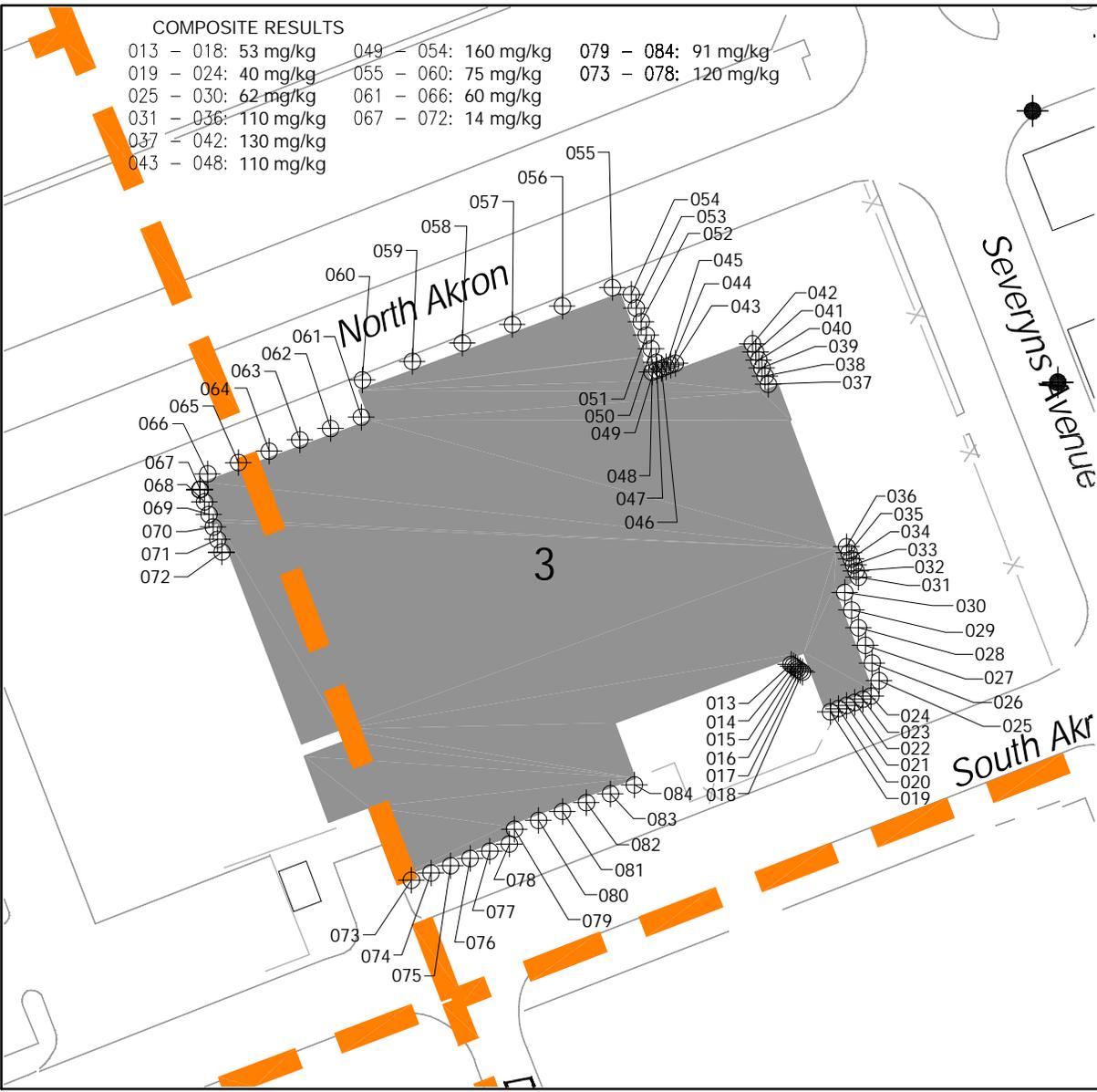


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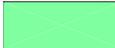


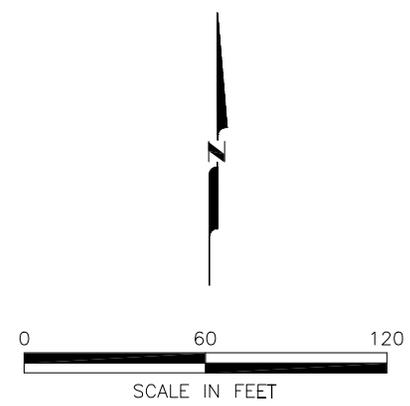
COMPOSITE RESULTS

013 - 018: 53 mg/kg	049 - 054: 160 mg/kg	079 - 084: 91 mg/kg
019 - 024: 40 mg/kg	055 - 060: 75 mg/kg	073 - 078: 120 mg/kg
025 - 030: 62 mg/kg	061 - 066: 60 mg/kg	
031 - 036: 110 mg/kg	067 - 072: 14 mg/kg	
037 - 042: 130 mg/kg		
043 - 048: 110 mg/kg		

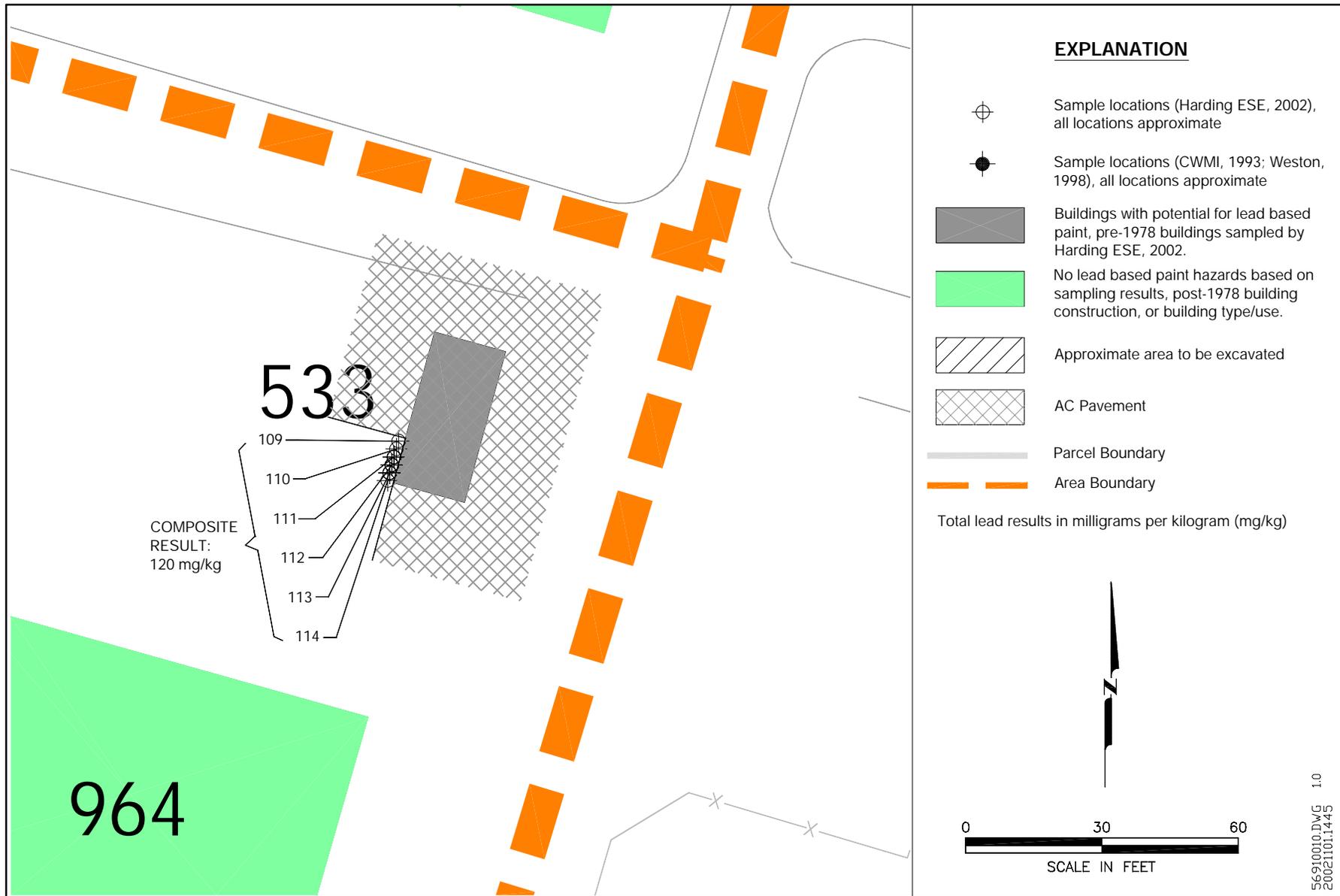


EXPLANATION

-  Sample locations (Harding ESE, 2002), all locations approximate
 -  Sample locations (CWMI, 1993; Weston, 1998), all locations approximate
 -  Buildings with potential for lead based paint, pre-1978 buildings sampled by Harding ESE, 2002.
 -  No lead based paint hazards based on sampling results, post-1978 building construction, or building type/use.
 -  Approximate area to be excavated
 -  Parcel Boundary
 -  Area Boundary
- Total lead results in milligrams per kilogram (mg/kg)



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Sampling Locations
Building 533 (Area 7)
Lead Sampling
NASA Research Park
Moffett Field, California

PLATE

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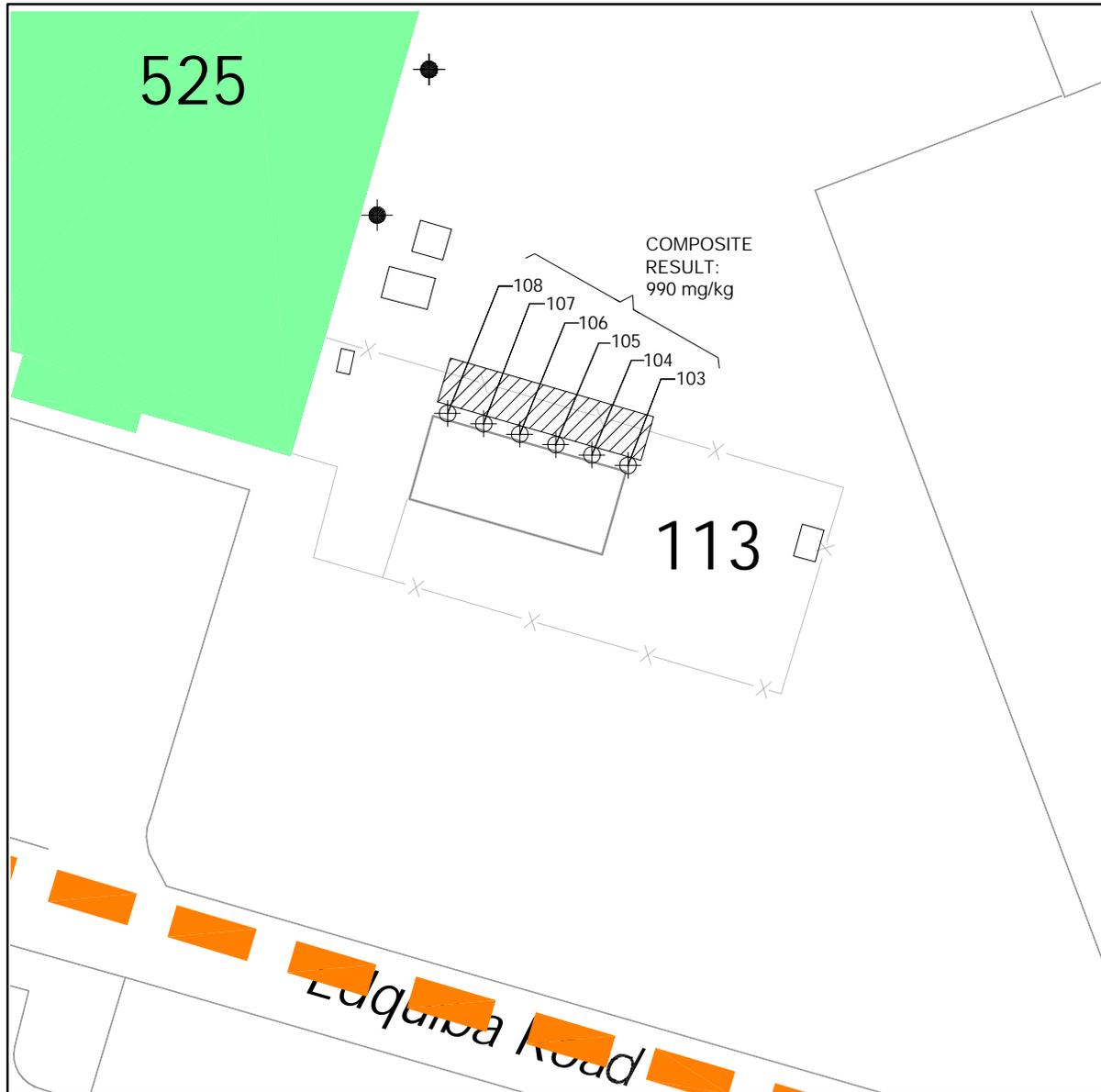
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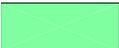
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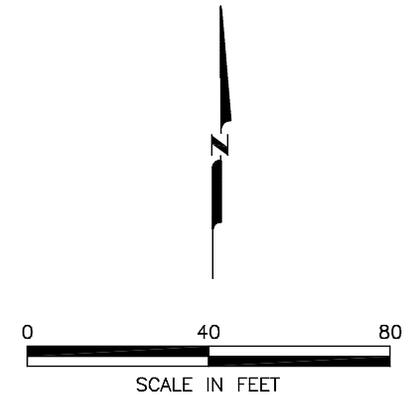
DATE
10/01

REVISED DATE

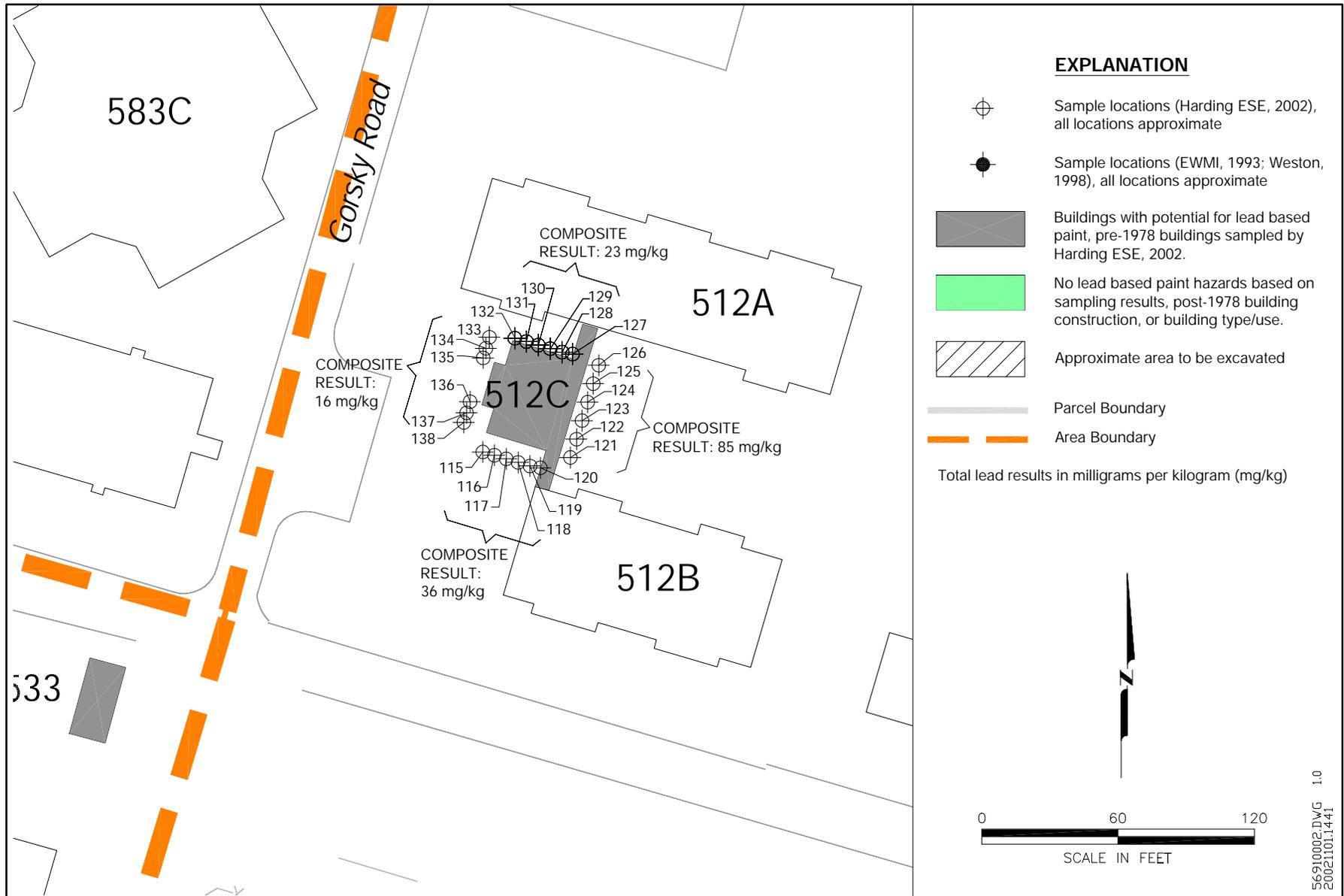


EXPLANATION

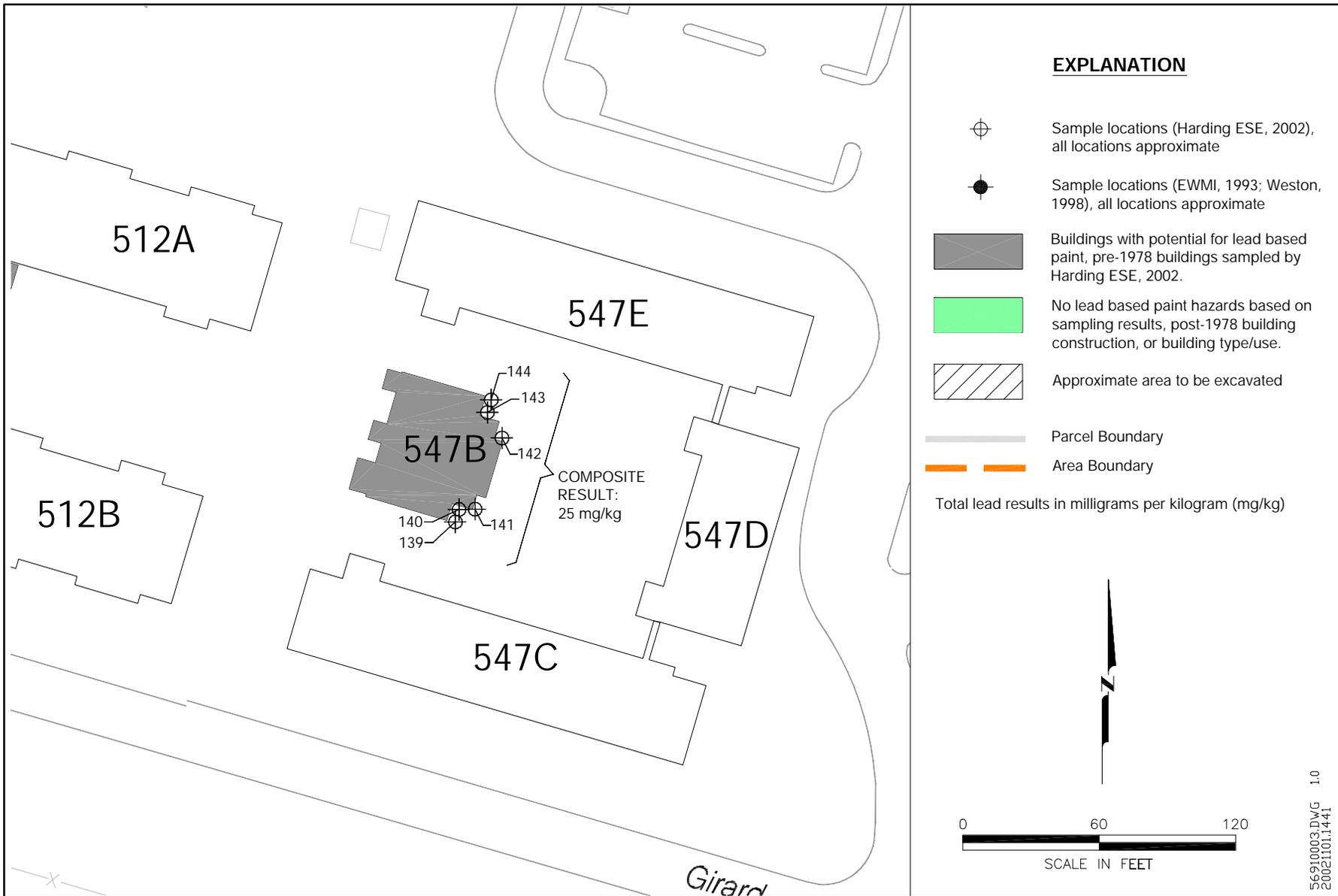
-  Sample locations (Harding ESE, 2002), all locations approximate
 -  Sample locations (CWMI, 1993; Weston, 1998), all locations approximate
 -  Buildings with potential for lead based paint, pre-1978 buildings sampled by Harding ESE, 2002.
 -  No lead based paint hazards based on sampling results, post-1978 building construction, or building type/use.
 -  Approximate area to be excavated
 -  Parcel Boundary
 -  Area Boundary
- Total lead results in milligrams per kilogram (mg/kg)



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1.0



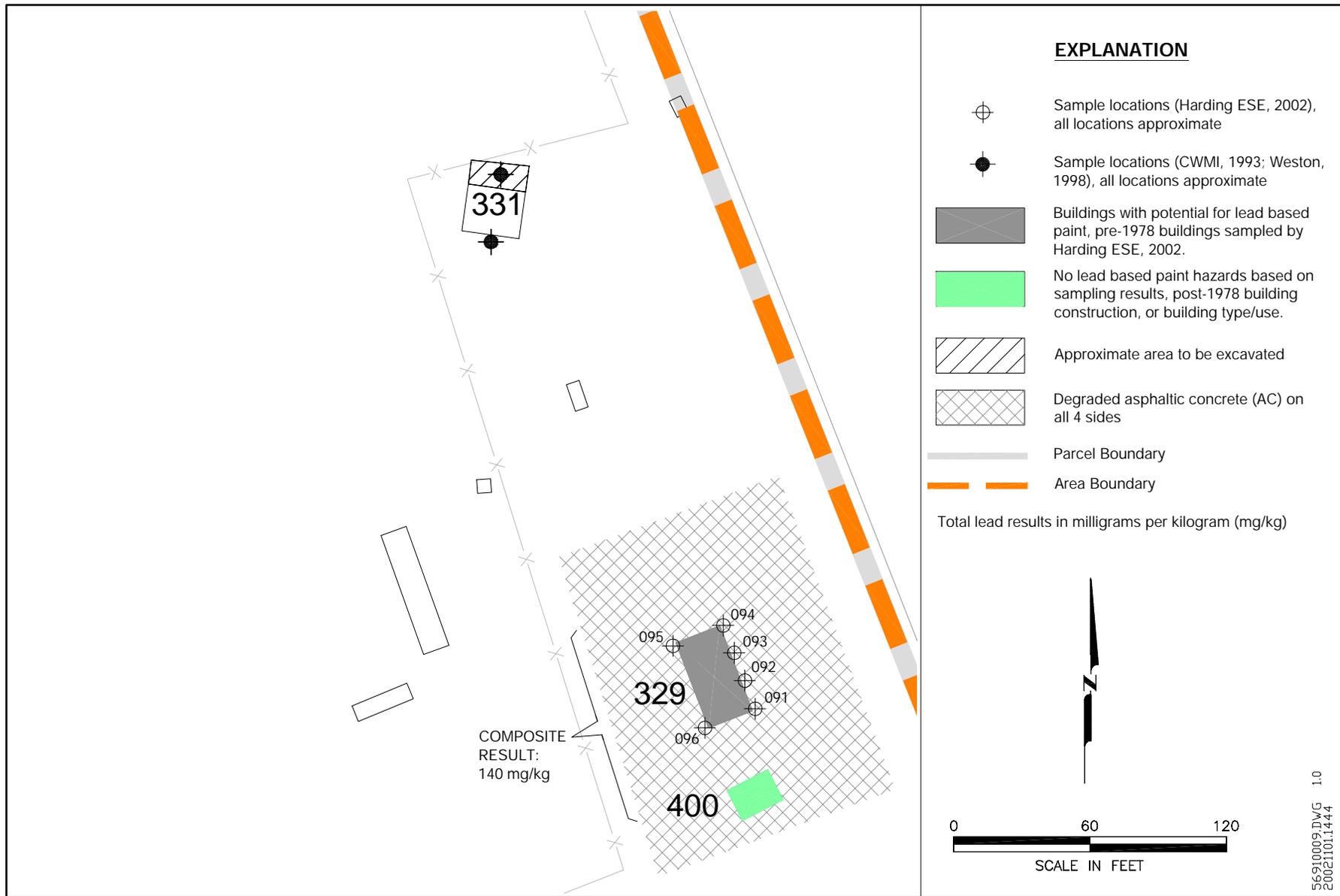
1.0
56910002.DWG
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1-0
56910003.DWG
20021101.144

PLATE

11





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4 October, 2002

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RE: General Commercial
Sequoia Work Order: P209467

Enclosed are the results of analyses for samples received by the laboratory on 09/19/02 13:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Michelle M. Wiita
Project Manager

CA ELAP Certificate #2374



Harding ESE
90 Digital Drive
Novato CA, 94949

Project: General Commercial
Project Number: NASA 56910.001
Project Manager: Gary Lieberman

P209467
Reported:
10/04/02 13:43

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Comp 020917024(001-006)	P209467-01	Soil	09/17/02 08:48	09/19/02 13:00
Comp 020917510(007-012)	P209467-02	Soil	09/17/02 09:10	09/19/02 13:00
Comp 020917003(013-018)	P209467-03	Soil	09/17/02 10:00	09/19/02 13:00
Comp 020917003(019-024)	P209467-04	Soil	09/17/02 10:12	09/19/02 13:00
Comp 020917003(025-030)	P209467-05	Soil	09/17/02 10:30	09/19/02 13:00
Comp 020917003(031-036)	P209467-06	Soil	09/17/02 10:42	09/19/02 13:00
Comp 020917003(037-042)	P209467-07	Soil	09/17/02 10:54	09/19/02 13:00
Comp 020917003(043-048)	P209467-08	Soil	09/17/02 11:06	09/19/02 13:00
Comp 020917003(049-054)	P209467-09	Soil	09/17/02 11:34	09/19/02 13:00
Comp 020917003(055-060)	P209467-10	Soil	09/17/02 11:46	09/19/02 13:00
Comp 020917003(061-066)	P209467-11	Soil	09/17/02 11:58	09/19/02 13:00
Comp 020917003(067-072)	P209467-12	Soil	09/17/02 12:10	09/19/02 13:00
Comp 020917003(073-078)	P209467-13	Soil	09/17/02 12:26	09/19/02 13:00
Comp 020917003(079-084)	P209467-14	Soil	09/17/02 12:38	09/19/02 13:00
Comp 020917329(091-096)	P209467-15	Soil	09/17/02 09:58	09/19/02 13:00
020917029101	P209467-16	Soil	09/17/02 15:20	09/19/02 13:00
020917029102	P209467-17	Soil	09/17/02 15:21	09/19/02 13:00
Comp 020917113(103-108)	P209467-18	Soil	09/17/02 10:40	09/19/02 13:00
Comp 020917533(109-114)	P209467-19	Soil	09/17/02 17:15	09/19/02 13:00
Comp 020917512(115-120)	P209467-20	Soil	09/17/02 17:40	09/19/02 13:00
Comp 020917512(121-126)	P209467-21	Soil	09/17/02 17:52	09/19/02 13:00
Comp 020917512(127-132)	P209467-22	Soil	09/17/02 18:04	09/19/02 13:00
Comp 020917512(133-138)	P209467-23	Soil	09/17/02 18:10	09/19/02 13:00
Comp 020917547(139-144)	P209467-24	Soil	09/17/02 18:16	09/19/02 13:00
Comp 020918943(145-150)	P209467-25	Soil	09/18/02 11:25	09/19/02 13:00
020917024A	P209467-26	Soil	09/17/02 08:48	09/19/02 13:00
020917003A	P209467-27	Soil	09/17/02 10:42	09/19/02 13:00
020917329A	P209467-28	Soil	09/17/02 09:58	09/19/02 13:00



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 Petaluma, CA 94954
 (707) 792-1865
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 www.sequoialabs.com

Harding ESE
 90 Digital Drive
 Novato CA, 94949

Project: General Commercial
 Project Number: NASA 56910.001
 Project Manager: Gary Lieberman

P209467
 Reported:
 10/04/02 13:43

Total Metals by EPA 6000/7000 Series Methods
Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Comp 020917024(001-006) (P209467-01) Soil Sampled: 09/17/02 08:48 Received: 09/19/02 13:00									
Lead	79	9.6	mg/kg	1	2090737	10/02/02	10/03/02	EPA 6010B	
Comp 020917510(007-012) (P209467-02) Soil Sampled: 09/17/02 09:10 Received: 09/19/02 13:00									
Lead	120	12	mg/kg	1	2090737	10/02/02	10/03/02	EPA 6010B	
Comp 020917003(013-018) (P209467-03) Soil Sampled: 09/17/02 10:00 Received: 09/19/02 13:00									
Lead	53	12	mg/kg	1	2090737	10/02/02	10/03/02	EPA 6010B	
Comp 020917003(019-024) (P209467-04) Soil Sampled: 09/17/02 10:12 Received: 09/19/02 13:00									
Lead	40	12	mg/kg	1	2090737	10/02/02	10/03/02	EPA 6010B	
Comp 020917003(025-030) (P209467-05) Soil Sampled: 09/17/02 10:30 Received: 09/19/02 13:00									
Lead	62	12	mg/kg	1	2090737	10/02/02	10/03/02	EPA 6010B	
Comp 020917003(031-036) (P209467-06) Soil Sampled: 09/17/02 10:42 Received: 09/19/02 13:00									
Lead	110	12	mg/kg	1	2090737	10/02/02	10/03/02	EPA 6010B	
Comp 020917003(037-042) (P209467-07) Soil Sampled: 09/17/02 10:54 Received: 09/19/02 13:00									
Lead	130	11	mg/kg	1	2090737	10/02/02	10/03/02	EPA 6010B	
Comp 020917003(043-048) (P209467-08) Soil Sampled: 09/17/02 11:06 Received: 09/19/02 13:00									
Lead	110	12	mg/kg	1	2090737	10/02/02	10/03/02	EPA 6010B	
Comp 020917003(049-054) (P209467-09) Soil Sampled: 09/17/02 11:34 Received: 09/19/02 13:00									
Lead	160	12	mg/kg	1	2090737	10/02/02	10/03/02	EPA 6010B	



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P209467
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**Total Metals by EPA 6000/7000 Series Methods
Sequoia Analytical - Petaluma**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Comp 020917003(055-060) (P209467-10) Soil Sampled: 09/17/02 11:46 Received: 09/19/02 13:00									
Lead	75	12	mg/kg	1	2090737	10/02/02	10/03/02	EPA 6010B	
Comp 020917003(061-066) (P209467-11) Soil Sampled: 09/17/02 11:58 Received: 09/19/02 13:00									
Lead	60	12	mg/kg	1	2090737	10/02/02	10/03/02	EPA 6010B	
Comp 020917003(067-072) (P209467-12) Soil Sampled: 09/17/02 12:10 Received: 09/19/02 13:00									
Lead	14	12	mg/kg	1	2090737	10/02/02	10/03/02	EPA 6010B	
Comp 020917003(073-078) (P209467-13) Soil Sampled: 09/17/02 12:26 Received: 09/19/02 13:00									
Lead	120	12	mg/kg	1	2090737	10/02/02	10/03/02	EPA 6010B	
Comp 020917003(079-084) (P209467-14) Soil Sampled: 09/17/02 12:38 Received: 09/19/02 13:00									
Lead	91	12	mg/kg	1	2090737	10/02/02	10/04/02	EPA 6010B	
Comp 020917329(091-096) (P209467-15) Soil Sampled: 09/17/02 09:58 Received: 09/19/02 13:00									
Lead	140	10	mg/kg	1	2090737	10/02/02	10/04/02	EPA 6010B	
020917029101 (P209467-16) Soil Sampled: 09/17/02 15:20 Received: 09/19/02 13:00									
Lead	90	11	mg/kg	1	2090737	10/02/02	10/04/02	EPA 6010B	
020917029102 (P209467-17) Soil Sampled: 09/17/02 15:21 Received: 09/19/02 13:00									
Lead	93	12	mg/kg	1	2090737	10/02/02	10/04/02	EPA 6010B	
Comp 020917113(103-108) (P209467-18) Soil Sampled: 09/17/02 10:40 Received: 09/19/02 13:00									
Lead	990	12	mg/kg	1	2090737	10/02/02	10/04/02	EPA 6010B	



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Project Manager: Gary Lieberman

P209467
Reported:
10/04/02 13:43

**Total Metals by EPA 6000/7000 Series Methods
Sequoia Analytical - Petaluma**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Comp 020917533(109-114) (P209467-19) Soil Sampled: 09/17/02 17:15 Received: 09/19/02 13:00									
Lead	58	12	mg/kg	1	2090737	10/02/02	10/04/02	EPA 6010B	
Comp 020917512(115-120) (P209467-20) Soil Sampled: 09/17/02 17:40 Received: 09/19/02 13:00									
Lead	36	12	mg/kg	1	2090737	10/02/02	10/04/02	EPA 6010B	
Comp 020917512(121-126) (P209467-21) Soil Sampled: 09/17/02 17:52 Received: 09/19/02 13:00									
Lead	85	15	mg/kg	1	2090738	10/02/02	10/03/02	EPA 6010B	
Comp 020917512(127-132) (P209467-22) Soil Sampled: 09/17/02 18:04 Received: 09/19/02 13:00									
Lead	23	14	mg/kg	1	2090738	10/02/02	10/03/02	EPA 6010B	
Comp 020917512(133-138) (P209467-23) Soil Sampled: 09/17/02 18:10 Received: 09/19/02 13:00									
Lead	16	15	mg/kg	1	2090738	10/02/02	10/03/02	EPA 6010B	
Comp 020917547(139-144) (P209467-24) Soil Sampled: 09/17/02 18:16 Received: 09/19/02 13:00									
Lead	25	14	mg/kg	1	2090738	10/02/02	10/03/02	EPA 6010B	
Comp 020918943(145-150) (P209467-25) Soil Sampled: 09/18/02 11:25 Received: 09/19/02 13:00									
Lead	170	15	mg/kg	1	2090738	10/02/02	10/03/02	EPA 6010B	
020917024A (P209467-26) Soil Sampled: 09/17/02 08:48 Received: 09/19/02 13:00									
Lead	160	15	mg/kg	1	2090738	10/02/02	10/03/02	EPA 6010B	
020917003A (P209467-27) Soil Sampled: 09/17/02 10:42 Received: 09/19/02 13:00									
Lead	99	15	mg/kg	1	2090738	10/02/02	10/03/02	EPA 6010B	



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Project: General Commercial
Project Number: NASA 56910.001
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P209467
Reported:
10/04/02 13:43

**Total Metals by EPA 6000/7000 Series Methods
Sequoia Analytical - Petaluma**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
020917329A (P209467-28) Soil Sampled: 09/17/02 09:58 Received: 09/19/02 13:00									
Lead	49	15	mg/kg	1	2090738	10/02/02	10/03/02	EPA 6010B	



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Project: General Commercial
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P209467
Reported:
10/04/02 13:43

**Total Metals by EPA 6000/7000 Series Methods - Quality Control
Sequoia Analytical - Petaluma**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 2090737 - EPA 3050B

Blank (2090737-BLK1)

Prepared: 10/02/02 Analyzed: 10/03/02

Lead ND 12 mg/kg

Matrix Spike (2090737-MS1)

Source: P209467-01

Prepared: 10/02/02 Analyzed: 10/03/02

Lead 113 12 mg/kg 48.3 79 70 80-120 QM-07

Matrix Spike Dup (2090737-MSD1)

Source: P209467-01

Prepared: 10/02/02 Analyzed: 10/03/02

Lead 189 12 mg/kg 49.5 79 222 80-120 50 20 QM-07, QR-07

Batch 2090738 - EPA 3050B

Blank (2090738-BLK1)

Prepared: 10/02/02 Analyzed: 10/03/02

Lead ND 15 mg/kg

Laboratory Control Sample (2090738-BS1)

Prepared: 10/02/02 Analyzed: 10/03/02

Lead 49.6 15 mg/kg 50.0 99 80-120

Matrix Spike (2090738-MS1)

Source: P209467-21

Prepared: 10/02/02 Analyzed: 10/03/02

Lead 106 15 mg/kg 48.5 85 43 80-120 QM-07

Matrix Spike Dup (2090738-MSD1)

Source: P209467-21

Prepared: 10/02/02 Analyzed: 10/03/02

Lead 126 14 mg/kg 47.7 85 86 80-120 17 20



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Project: General Commercial
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P209467
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10/04/02 13:43

Notes and Definitions

- QM-07 The spike recovery was outside control limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
- QR-07 The RPD was outside control limits. The results may still be useful for their intended purpose.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference



Harding ESE
A MACTEC COMPANY
90 Digital Drive
Novato, CA 94949
(415) 883-0112

CHAIN OF CUSTODY FORM

Seq. No.: **Nº 10369**

Lab:

Samplers: Matt Wehrman

Job Number: 5691D 001

Name/Location: NASA

Project Manager: GARY LIBBERMAN

Recorder: Christine Abad
(Signature Required)

ANALYSIS REQUESTED

Gasoline Range Organics 8015B			
Diesel Range Organics 8015B			
BTEX plus MTBE			
CCR Title 22 Metals (17)			
EPA 8021B			
EPA 8260B			
EPA 8270C			
Lead			

P209467

GPT camp -06
031-036*

GPT camp -07
037-062

MATRIX	# CONTAINERS & PRESERV.	SAMPLE NUMBER			DATE			STATION DESCRIPTION	
		YR	SEQ	YR MO DAY	TIME	DEPTH			
X		0209	17003031	0209	17	10	32		
X		0209	17003032	0209	17	10	34		
X		0209	17003033	0209	17	10	36		
X		0209	17003034	0209	17	10	38		
X		0209	17003035	0209	17	10	40		
X		0209	17003036	0209	17	10	42		
X		0209	17003037	0209	17	10	44		
X		0209	17003038	0209	17	10	46		
X		0209	17003039	0209	17	10	48		
X		0209	17003040	0209	17	10	50		

CHAIN OF CUSTODY RECORD

Requisitioned By: (signature) <u>Christine Abad</u>	(Print Name) Christine Abad	Date/Time 9/19/02 11:40
Received By: (signature) <u>Gary Libberman</u>	(Print Name) Gary Libberman	Date/Time 9/19/02
Relinquished By: (signature) <u>Christine Abad</u>	(Print Name) Christine Abad	Date/Time 9/19/02 11:45
Received By: (signature) <u>Alfredo Lopez</u>	(Print Name) Alfredo Lopez	Date/Time 9/19/02 13:00
Relinquished By: (signature)	(Print Name)	Date/Time
Received By: (signature)	(Print Name)	Date/Time
Received By: (signature)	(Print Name)	Date/Time
Method of Shipment:		

ADDITIONAL INFORMATION

SAMPLE NUMBER	TURNAROUND TIME/REMARKS
	Standard 7A
	* For this sample - after commencing - please split into two samples & analyze 2nd sample as 020917003 03 ^a
	P209467-29



CHAIN OF CUSTODY FORM

Seq. No.: N^o 10374

Lab: _____

Job Number: 51091D001

Samplers: Math Debrauer

Name/Location: NASA

Project Manager: Gregy UBERMAN

Recorder: Quinn Howard
(Signature Required)

MATRIX	#CONTAINERS & PRESERV.	SAMPLE NUMBER			DATE		
		YR	SEQ	YR	MO	DAY	TIME
Water		02	0917	003081	02	09	171232
Soil		02	0917	003082	02	09	171234
Air		02	0917	003083	02	09	171236
Unpres		02	0917	003084	02	09	171238
H ₂ SO ₄		02	0917	003085	02	09	171440
HNO ₃		02	0917	003086	02	09	171442
HCL		02	0917	003087	02	09	171444
		02	0917	003088	02	09	171446
		02	0917	003089	02	09	171448
		02	0917	003090	02	09	171450

STATION DESCRIPTION	DEPTH
<u>Bldg 31</u>	
<u>Bldg 943</u>	

ANALYSIS REQUESTED	
Gasoline Range Organics 8015B	
Diesel Range Organics 8015B	
BTEX plus MTBE	
CCR Title 22 Metals (17)	
EPA 8021B	
EPA 8260B	
EPA 8270C	
<u>Lead</u>	

ADDITIONAL INFORMATION

CHAIN OF CUSTODY RECORD

SAMPLE NUMBER	TURNAROUND TIME/REMARKS
	<u>Standard FA</u>

Remanded By: (signature) <u>[Signature]</u>	(Print Name) <u>Bond Livisthe</u>	(Company) <u>Harding</u>	Date/Time <u>11/10/02 11:12</u>
Received By: (signature) <u>[Signature]</u>	(Print Name) <u>Gary Lieberman</u>	(Company) <u>Harding</u>	Date/Time <u>9/11/02</u>
Relinquished By: (signature) <u>[Signature]</u>	(Print Name) <u>[Signature]</u>	(Company) <u>[Signature]</u>	Date/Time <u>[Signature]</u>
Received By: (signature) <u>[Signature]</u>	(Print Name) <u>[Signature]</u>	(Company) <u>[Signature]</u>	Date/Time <u>[Signature]</u>
Received By: (signature) <u>[Signature]</u>	(Print Name) <u>[Signature]</u>	(Company) <u>[Signature]</u>	Date/Time <u>[Signature]</u>
Method of Shipment:			



CHAIN OF CUSTODY FORM

Seq. No.: N 10377
Lab: _____

Job Number: 56910001
Name/Location: NASA
Project Manager: GAEY LIEBERMAN
Recorder: David Mark
Samplers: Matt Walker

(Signature Required)

MATRIX	#CONTAINERS & PRESERV.	SAMPLE NUMBER				DATE			
		YR	SEQ	YR	MO	DAY	TIME		
Water		02	09117534	11	02	09	11	71	709
Soil		02	09117534	11	02	09	11	71	709
Air		02	09117534	11	02	09	11	71	709
Unpres		02	09117534	11	02	09	11	71	709
H ₂ SO ₄		02	09117534	11	02	09	11	71	709
HNO ₃		02	09117534	11	02	09	11	71	709
HCL		02	09117534	11	02	09	11	71	709

STATION DESCRIPTION	DEPTH
Bldg 5343	
Bldg 512C	

ANALYSIS REQUESTED	
Gasoline Range Organics 8015B	
Diesel Range Organics 8015B	
BTEX plus MTBE	
CCR Title 22 Metals (17)	
EPA 8021B	
EPA 8260B	
EPA 8270C	
Lead	

ADDITIONAL INFORMATION

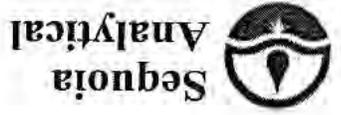
CHAIN OF CUSTODY RECORD

TURNAROUND TIME/REMARKS

Standard FA

Relinquished By: (signature) <u>David Mark</u>	(Print Name) <u>David Mark</u>	(Company) <u>Harding</u>	Date/Time <u>9/12/11</u>
Received By: (signature) <u>Gary Lieberman</u>	(Print Name) <u>Gary Lieberman</u>	(Company) <u>Harding</u>	Date/Time <u>9/14</u>
Relinquished By: (signature) <u>David Mark</u>	(Print Name) <u>David Mark</u>	(Company) <u>Harding</u>	Date/Time <u>9/14</u>
Received By: (signature) <u>David Mark</u>	(Print Name) <u>David Mark</u>	(Company) <u>Harding</u>	Date/Time <u>9/14</u>
Relinquished By: (signature) _____	(Print Name) _____	(Company) _____	Date/Time _____
Received By: (signature) _____	(Print Name) _____	(Company) _____	Date/Time _____
Relinquished By: (signature) _____	(Print Name) _____	(Company) _____	Date/Time _____
Received By: (signature) _____	(Print Name) _____	(Company) _____	Date/Time _____

Method of Shipment:



29 October, 2002

Gary Lieberman
Harding ESE
90 Digital Drive
Novato, CA 94949

RE: General Commercial
Sequoia Work Order: P210470

Enclosed are the results of analyses for samples received by the laboratory on 10/21/02 06:35. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Michelle M. Witte
Project Manager

CA ELAP Certificate #2374

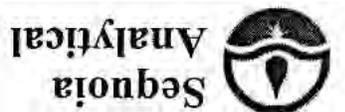
Harding ESE 90 Digital Drive Novato CA, 94949	Project: General Commercial Project Number: NASA 56910.001 Project Manager: Gary Lieberman	Reported: P210470 10/29/02 10:04
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ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
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Comp 020917024(001-006)	P210470-01	Soil	09/17/02 08:48	10/21/02 06:35
Comp 020917510(007-012)	P210470-02	Soil	09/17/02 09:10	10/21/02 06:35
Comp 020917003(013-018)	P210470-03	Soil	09/17/02 10:00	10/21/02 06:35
Comp 020917003(025-030)	P210470-04	Soil	09/17/02 10:30	10/21/02 06:35
Comp 020917003(031-036)	P210470-05	Soil	09/17/02 10:42	10/21/02 06:35
Comp 020917003(037-042)	P210470-06	Soil	09/17/02 10:54	10/21/02 06:35
Comp 020917003(043-048)	P210470-07	Soil	09/17/02 11:06	10/21/02 06:35
Comp 020917003(049-054)	P210470-08	Soil	09/17/02 11:34	10/21/02 06:35
Comp 020917003(055-060)	P210470-09	Soil	09/17/02 11:46	10/21/02 06:35
Comp 020917003(061-066)	P210470-10	Soil	09/17/02 11:58	10/21/02 06:35
Comp 020917003(073-078)	P210470-11	Soil	09/17/02 12:26	10/21/02 06:35
Comp 020917003(079-084)	P210470-12	Soil	09/17/02 12:38	10/21/02 06:35
Comp 020917329(091-096)	P210470-13	Soil	09/17/02 09:58	10/21/02 06:35
020917029101	P210470-14	Soil	09/17/02 15:20	10/21/02 06:35
020917029102	P210470-15	Soil	09/17/02 15:21	10/21/02 06:35
Comp 020917533(109-114)	P210470-16	Soil	09/17/02 17:15	10/21/02 06:35
Comp 020917512(121-126)	P210470-17	Soil	09/17/02 17:52	10/21/02 06:35
Comp 020918943(145-150)	P210470-18	Soil	09/18/02 11:25	10/21/02 06:35
020917024A	P210470-19	Soil	09/17/02 08:48	10/21/02 06:35
020917003A	P210470-20	Soil	09/17/02 10:42	10/21/02 06:35

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Harding ESE
 90 Digital Drive
 Novato CA, 94949
 Project: General Commercial
 Project Number: NASA 56910.001
 Project Manager: Gary Lieberman
 P210470
 Reported: 10/29/02 10:04

STLC CAM Metals by EPA 6000/7000 Series Methods
Seqnoia Analytical - Petaluma

Analyte	Reporting	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Lead	Comp 020917024(001-006) (P210470-01) Soil	Sampled: 09/17/02 08:48	Received: 10/21/02 06:35	ND	380	ug/l	1	2100694	10/25/02	10/27/02	EPA 6010B
Lead	Comp 020917510(007-012) (P210470-02) Soil	Sampled: 09/17/02 09:10	Received: 10/21/02 06:35	ND	380	ug/l	1	2100694	10/25/02	10/27/02	EPA 6010B
Lead	Comp 020917003(013-018) (P210470-03) Soil	Sampled: 09/17/02 10:00	Received: 10/21/02 06:35	14000	380	ug/l	1	2100694	10/25/02	10/27/02	EPA 6010B
Lead	Comp 020917003(013-018) (P210470-03) Soil	Sampled: 09/17/02 10:00	Received: 10/21/02 06:35	1500	380	ug/l	1	2100779	10/26/02	10/28/02	EPA 6010B
Lead	Comp 020917003(025-030) (P210470-04) Soil	Sampled: 09/17/02 10:30	Received: 10/21/02 06:35	2300	380	ug/l	1	2100694	10/25/02	10/27/02	EPA 6010B
Lead	Comp 020917003(031-036) (P210470-05) Soil	Sampled: 09/17/02 10:42	Received: 10/21/02 06:35	4300	380	ug/l	1	2100694	10/25/02	10/27/02	EPA 6010B
Lead	Comp 020917003(037-042) (P210470-06) Soil	Sampled: 09/17/02 10:54	Received: 10/21/02 06:35	5100	380	ug/l	1	2100694	10/25/02	10/27/02	EPA 6010B
Lead	Comp 020917003(043-048) (P210470-07) Soil	Sampled: 09/17/02 11:06	Received: 10/21/02 06:35	4500	380	ug/l	1	2100779	10/26/02	10/28/02	EPA 6010B
Lead	Comp 020917003(049-054) (P210470-08) Soil	Sampled: 09/17/02 11:34	Received: 10/21/02 06:35	1900	380	ug/l	1	2100694	10/25/02	10/27/02	EPA 6010B
Lead	Comp 020917003(055-060) (P210470-09) Soil	Sampled: 09/17/02 11:46	Received: 10/21/02 06:35	ND	380	ug/l	1	2100694	10/25/02	10/27/02	EPA 6010B

Seqnoia Analytical - Petaluma

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Harding ESE 90 Digital Drive Novato CA, 94949	Project: General Commercial Project Number: NASA 56910.001 Project Manager: Gary Lieberman	P210470 Reported: 10/29/02 10:04
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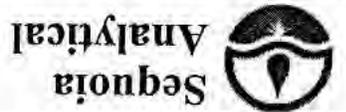
STLC CAM Metals by EPA 6000/7000 Series Methods
Sequoia Analytical - Petaluma

Analyte	Reporting	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Lead	020917003(061-066) (P210470-10) Soil	380	ND	ug/l	1	2100779	10/26/02	10/28/02	EPA 6010B	
Lead	020917003(073-078) (P210470-11) Soil	380	ND	ug/l	1	2100779	10/26/02	10/28/02	EPA 6010B	
Lead	020917003(079-084) (P210470-12) Soil	4600	3800	ug/l	1	2100779	10/26/02	10/28/02	EPA 6010B	
Lead	020917329(091-096) (P210470-13) Soil	380	ND	ug/l	1	2100779	10/26/02	10/28/02	EPA 6010B	
Lead	020917029101 (P210470-14) Soil	5000	380	ug/l	1	2100779	10/26/02	10/28/02	EPA 6010B	
Lead	020917029102 (P210470-15) Soil	6400	380	ug/l	1	2100779	10/26/02	10/28/02	EPA 6010B	
Lead	020917533(109-114) (P210470-16) Soil	380	ND	ug/l	1	2100779	10/26/02	10/28/02	EPA 6010B	
Lead	020917512(121-126) (P210470-17) Soil	380	ND	ug/l	1	2100779	10/26/02	10/28/02	EPA 6010B	
Lead	020918943(145-150) (P210470-18) Soil	380	1000	ug/l	1	2100779	10/26/02	10/28/02	EPA 6010B	

Sequoia Analytical - Petaluma

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Harding ESE
 90 Digital Drive
 Novato CA, 94949
 Project: General Commercial
 Project Number: NASA 56910.001
 Project Manager: Gary Lieberman
 P210470
 Reported: 10/29/02 10:04

STLC CAM Metals by EPA 6000/7000 Series Methods
Sequoia Analytical - Petaluma

Analyte	Reporting	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Lead	ND	380	ug/l	1	2100779	10/26/02	10/28/02	EPA 6010B		020917024A (P210470-19) Soil Sampled: 09/17/02 08:48 Received: 10/21/02 06:35
Lead	2000	380	ug/l	1	2100779	10/26/02	10/28/02	EPA 6010B		020917003A (P210470-20) Soil Sampled: 09/17/02 10:42 Received: 10/21/02 06:35

The results in this report apply to the samples analyzed in accordance with the chain of custody document. Unless otherwise stated, results are reported on a wet weight basis. This analytical report must be reproduced in its entirety.

Harding ESE 90 Digital Drive Novato CA, 94949	Project: General Commercial Project Number: NASA 56910.001	Project Manager: Gary Lieberman
	Reported: P210470	10/29/02 10:04

STLC CAM Metals by EPA 6000/7000 Series Methods - Quality Control
Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	Limits	RPD	Notes
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Batch 2100694 - EPA 3010A

Blank (2100694-BLK1) Prepared: 10/25/02 Analyzed: 10/27/02

Laboratory Control Sample (2100694-BS1) Prepared: 10/25/02 Analyzed: 10/27/02

Lead 2530 380 ug/l 2500 101 80-120

Matrix Spike (2100694-MS1) Source: P210470-01 Prepared: 10/25/02 Analyzed: 10/27/02

Lead 2570 380 ug/l 2500 93 80-120

Matrix Spike Dup (2100694-MSD1) Source: P210470-01 Prepared: 10/25/02 Analyzed: 10/27/02

Lead 2620 380 ug/l 2500 95 80-120 2 20

Batch 2100779 - EPA 3010A

Blank (2100779-BLK1) Prepared: 10/23/02 Analyzed: 10/28/02

Laboratory Control Sample (2100779-BS1) Prepared: 10/23/02 Analyzed: 10/28/02

Lead 2300 380 ug/l 2500 92 80-120

Matrix Spike (2100779-MS1) Source: P210470-15 Prepared: 10/23/02 Analyzed: 10/28/02

Lead 8580 380 ug/l 2500 6400 87 80-120

Matrix Spike Dup (2100779-MSD1) Source: P210470-15 Prepared: 10/23/02 Analyzed: 10/28/02

Lead 8490 380 ug/l 2500 6400 84 80-120 1 20

Harding ESE 90 Digital Drive Novato CA, 94949	Project: General Commercial Project Number: NASA 56910.001 Project Manager: Gary Lieberman	Reported: P210470 10/29/02 10:04
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Notes and Definitions

- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference



18 October, 2002

Gary Lieberman
Harding ESE
90 Digital Drive
Novato, CA 94949

RE: General Commercial
Sequoia Work Order: P209467

Enclosed are the results of analyses for samples received by the laboratory on 09/19/02 13:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Michelle M. Witta".

Michelle M. Witta
Project Manager

CA ELAP Certificate #2374

Harding ESE	Project: General Commercial	Project Number: NASA 56910.001	Project Manager: Gary Lieberman
90 Digital Drive			
Novato CA, 94949			
Reported: P209467			
10/18/02 19:48			

ANALYTICAL REPORT FOR SAMPLES

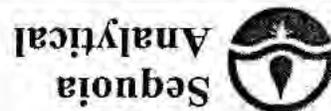
Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Comp 020917113(103-108)	P209467-18	Soil	09/17/02 10:40	09/19/02 13:00

Harding ESE	Project: General Commercial	Project Number: NASA 56910.001	Reported: P209467
90 Digital Drive		Project Manager: Gary Lieberman	
Novato CA, 94949			10/18/02 19:48

STLC CAM Metals by EPA 6000/7000 Series Methods
Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Lead	22000	380	ug/l	I	2100174	10/13/02	10/17/02	EPA 6010B	
Comp 020917113(103-108) (P209467-18) Soil Sampled: 09/17/02 10:40 Received: 09/19/02 13:00									



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Harding ESE	Project: General Commercial	Project Number: NASA 56910.001	Reported: P209467
90 Digital Drive			
Novato CA, 94949			
	Project Manager: Gary Lieberman		10/18/02 19:48

STLC CAM Metals by EPA 6000/7000 Series Methods - Quality Control
Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Spike Level	Source	%RBC	Limits	RPD	Notes
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Batch 2100174 - EPA 3005A

Blank (2100174-BLK1)	ND	380	ng/l						
Prepared: 10/13/02 Analyzed: 10/17/02									

Laboratory Control Sample (2100174-BS1)	2420	380	ng/l	2500			97	80-120	
Prepared: 10/13/02 Analyzed: 10/17/02									

Matrix Spike (2100174-MS1)	23100	380	ng/l	2500	22000		44	80-120	QM-07
Source: P209467-18 Prepared: 10/13/02 Analyzed: 10/17/02									

Matrix Spike Dup (2100174-MSD1)	24600	380	ng/l	2500	22000		104	80-120	20
Source: P209467-18 Prepared: 10/13/02 Analyzed: 10/17/02									

Sequoia Analytical - Petaluma

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Harding ESE 90 Digital Drive Novato CA, 94949	Project: General Commercial Project Number: NASA 56910.001 Project Manager: Gary Lieberman	Reported: P209467 10/18/02 19:48
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Notes and Definitions

QM-07 The spike recovery was outside control limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.

DET Analyte DETECTED
ND Analyte NOT DETECTED at or above the reporting limit
NR Not Reported
dry Sample results reported on a dry weight basis
RPD Relative Percent Difference

Sequoia Analytical - Petaluma

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