

**DRAFT
PRELIMINARY ENDANGERMENT ASSESSMENT REPORT
LAUREL SCHOOL UPPER CAMPUS
275 ELLIOTT DRIVE
MENLO PARK, CALIFORNIA 94025**

Prepared for

Menlo Park City School District
181 Encinal Ave.
Atherton, California, 94025

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CONTENTS

ACRONYMS AND ABBREVIATIONS.....	IV
EXECUTIVE SUMMARY	V
1.0 INTRODUCTION.....	1
1.1 Purpose and Objectives.....	1
1.2 Scope of Work	2
1.3 Significant Assumptions	2
1.4 Modifications or Deviations	2
1.5 Information Provided by the Landowner	2
1.6 Other Site Information	3
2.0 SITE DESCRIPTION	4
2.1 Site Identification	4
2.1.1 Site Name	4
2.1.2 Contact Person	4
2.1.3 Site Description	4
2.2 Site Geology and Hydrogeology	6
3.0 BACKGROUND	7
3.1 Site Status/Historical Site Information.....	7
3.1.1 Owner, Property Manager and Occupant Information.....	7
3.2 Hazardous Material/Substance/Waste Management Information	7
3.3 Current and Historical Uses of Surrounding Properties.....	8
3.4 All Appropriate Inquiries Information.....	8
3.4.1 Specialized Knowledge	8
3.4.2 Commonly Known or Reasonably Ascertainable Information	8
3.4.3 Valuation Reduction for Environmental Liens	8
3.5 Records Review Information	8
3.5.1 Land Records	8
3.5.2 Aerial Photograph Review	9
3.5.3 Historical USGS Topographic Map	9
3.5.4 City Directories	9
3.5.5 Standard Environmental Record Sources.....	9

3.6	Site Reconnaissance.....	9
3.7	Interviews.....	9
4.0	APPARENT PROBLEM	10
5.0	ENVIRONMENTAL SETTING	11
5.1	Conceptual Site Model.....	11
5.2	Factors Related to Soil Pathways.....	11
5.2.1	Site Topography	11
5.2.2	Site Geology and Soil Types	11
5.2.3	Site Accessibility.....	12
5.2.4	Proximity to Nearby Receptors.....	12
5.3	Factors Related to Water Pathways.....	12
5.4	Factors Related to Air Pathways	13
6.0	SAMPLING ACTIVITIES AND RESULTS	14
6.1	Summary of Activities	14
6.2	Presentation of Data	16
6.2.1	Sample Collection.....	16
6.2.2	Surveying.....	16
6.2.3	Sample Identification	16
6.2.4	Packaging and Shipping.....	17
6.2.5	Field Quality Assurance/Quality Control Procedures	17
6.2.6	Laboratory Quality Assurance/Quality Control Procedures	18
6.3	Discussion of Results.....	19
6.3.1	Metals	19
6.3.2	PCBs.....	19
6.3.3	OCPs	19
6.3.4	Asbestos	19
7.0	HUMAN HEALTH SCREENING EVALUATION	20
7.1	Exposure Pathways and Media of Concern	20
7.2	Exposure Concentrations and Chemicals.....	20
7.3	Human Health Screening Levels.....	21
7.4	Toxicity Values	21
7.5	Risk Characterization Summary	22
8.0	ECOLOGICAL SCREENING EVALUATION	23

8.1	Biological Characterization.....	23
8.2	Ecological Pathway Assessment.....	23
8.3	Ecological Screening Evaluation Summary.....	23
9.0	COMMUNITY PROFILE	24
10.0	OPINION OF ENVIRONMENTAL PROFESSIONAL.....	25
11.0	CONCLUSIONS AND RECOMMENDATIONS	26
11.1	Summary and Conclusions	26
11.2	Recommendations	26
11.2.1	Dieldrin in Planters	26
11.2.2	Radon	26
11.2.3	Base Rock	26
11.3	Data Gaps	27
11.4	Preliminary Scoping Recommendations	27
12.0	REFERENCES.....	28
13.0	SIGNATURES AND ENVIRONMENTAL PROFESSIONALS STATEMENT	30

TABLES

- 1 Organochlorine Pesticides results
- 2 Metals and PCB Results
- 3 Asbestos Results

FIGURES

- 1 Site Location Map
- 2 Site Features
- 3 Historic Site Features - 1956
- 4 Conceptual Site Model
- 5 Geological Section
- 6 Dieldrin Sampling Locations and Results
- 7 Asbestos Sampling Locations and Results

APPENDIX

- A Phase I Environmental Site Assessment
- B Laboratory Analytical Results
- C Operations and Maintenance Plan

Acronyms and Abbreviations

AST	aboveground storage tank
BAAG	Bay Area Geotechnical Group
BAAQMD	Bay Area Air Quality Management District
bgs	below ground surface
C&T	Curtis & Tompkins Laboratories
Cal-EPA	California Environmental Protection Agency
CARB	California Air Resources Board
CDE	California Department of Education
CHHSLS	California Human Health Screening Levels
COCs	constituents of concern
COPCs	constituents of potential concern
DOT	United States Department of Transportation
DTSC	California Environmental Protection Agency, Department of Toxic Substances Control
EPA	United States Environmental Protection Agency
ESA	Environmental Site Assessment
ESLs	Environmental Screening Levels
HHRA	Human Health Risk Assessment
HASP	Health and Safety Plan
in Hg	inches of mercury
LBP	lead-based paints
mg/kg	milligrams per kilogram
ml	milliliters
NOA	naturally-occurring asbestos
OCPs	organochlorine pesticides
OEHHA	Office of Ecological and Human Health Assessment
O&M	Operations and Maintenance
OSHA	Occupational Safety and Health Administration
PEA	Preliminary Endangerment Assessment
PCBs	polychlorinated biphenyls
PID	photoionization detector
QA/QC	quality assurance/quality control
RSL	Regional Screening Level
SFBRWQCB	San Francisco Bay Regional Water Quality Control Board
TEM	Transmission Electron Microscopy
ug/kg	microgram per kilogram (part per billion)
U.S. EPA	United States Environmental Protection Agency
VOC	volatile organic compounds

Executive Summary

At the request and authorization of the Client, Menlo Park City School District (the “District”), Terraphase Engineering has prepared a Preliminary Endangerment Assessment (PEA) for the property addressed as 275 Elliott Drive in the City of Menlo Park, San Mateo County, California. The purpose of this PEA was to identify whether a release or threatened of hazardous substances exists at the site and to evaluate the potential risk to human health or the environment posed by the Site and to recommend mitigation measures so that the Department of Toxic Substances Control (DTSC) can issue a “No Further Action Designation” for the property.

The subject property is located on a single parcel identified by Assessor’s Parcel Number (APN) 063-430-310. The subject property is located in an area of predominately residential use and is surrounded by single family houses. The subject property itself is a German American International School. The main school building at the site is approximately 14,000 square feet in size located in the southwestern corner of the property. To the west and north of the building are blacktop and playground areas. Six modular classroom units surround the main building. Four portable storage units are also present on the site.

Based on the Phase I ESA Terraphase performed, the subject property was used for small scale agricultural purposes until the 1950s. Historical aerial photographs show a series of separate fields present, although agricultural uses for the fields are unknown. Sometime during the 1950s the site was transferred to the Ravenswood City School District. In the 1950s the site was developed as the O’Connor School, the main structure still present today. No other structures were present on aerial photography from the 1950s through the 1990s. In 1983 voters passed Measure “A” transferring the neighborhood in which the Site is located from the Ravenswood City School District to the Menlo Park City School District. In the mid to late-1980s, the Site was used as the location of the Cancer Support and Education Center. In 1991 the German American International School took occupancy of the Site for use as a private school. No manufacturing activities were identified as having occurred at the Site.

Terraphase reviewed the DTSSC Envirostor database, the San Francisco Bay Regional Water Quality Control District (SFRWQCB) Geotracker database and the files of the San Mateo County Health System Environmental Division. No significant environmental information regarding the Site or adjacent properties were found in these sources.

On January 8, 2015, Terraphase personnel conducted a site reconnaissance to physically observe the site and adjoining properties for conditions indicating a potential environmental concern. Concerns would include any evidence of contamination, distressed vegetation, petroleum-hydrocarbon staining, waste drums, illegal dumping, or improper

waste storage and/or handling. No evidence of environmental concern was noted on the subject property during our subject property reconnaissance efforts.

This PEA was prepared due to the following issues; (1) Base rock used for construction at other schools in the same era as the Site were contaminated with naturally-occurring asbestos (NOA), (2) Lead based paint may exist in structures at the Site, (3) The potential presence of termiticides in the soil surrounding the existing school structures, and (4) The Site was formerly used for agricultural purposes and hence agricultural chemicals are a potential chemical concern at the Site.

On March 6, 2014 representatives of Terraphase, the DTSC, and Menlo Park City School District conducted a site walk to identify potential sampling areas at the Site. Soil sampling activities took place on April 14th and 15th of 2014 based on the site walk observations. Samples were collected using a hand auger. Around the main school building where there was potential organochlorine pesticide (OCP) affected soil on site, one three-point composite sample from shallow soil (0 to 6 inches below ground surface (BGS)) and one three-point composite of deeper soil (3 to 3.5 feet bgs) were collected. Due to the potential lead-based paint-affected soil around the perimeter of the main school and around the perimeter of the portable storage unit due to peeling paint, eight discrete shallow soil samples for lead analysis were collected. These samples were collected from shallow soil, 0 to 6 inches bgs. Six sample locations were located within the building drip line and two samples were collected in planting beds below the roof opening. An additional four samples were collected from the accessible areas surrounding the portable storage units. Six samples were also collected for arsenic and pesticides analysis across the site. These composite samples consisted of two-point composites collected from shallow soil (0 to 6 inches). These samples were collected in the historical agricultural fields identified in historical photos. Samples for Polychlorinated biphenyls (PCBs) analysis were collected from shallow soil (0 to 6 inches bgs) located directly beneath the window where the roof opening is located to evaluate for potential PCB-contaminating window caulking material. Finally field geologists assessed the soil for potential presence of NOA containing base rock beneath buildings or parking areas – the base rock was imported to the Site from a local quarry and is not therefore believed to be widespread at the Site or currently exposed in the environment. Samples of the base rock were submitted for analysis of asbestos. A total of 28 samples were collected during this event.

On June 7, 2014 an additional 18 step out samples were collected for analysis of OCPs. Discrete soil samples were collected from borings B13, B14, and B15 at depths of 0 to 0.5 feet bgs and 1 to 1.5 feet bgs located along the northeastern and southeastern sides of the building. Discrete samples were collected from previous boring locations B7, B8 from 1 to 1.5 feet bgs and B9 from depths of 0 to 0.5 feet bgs. Discrete sample locations were also

collected at B7A, B8A, B8B, and B8C at depths of 0 to 0.5 feet bgs and 1 to 1.5 feet bgs to assess the lateral and vertical extent of dieldrin within planter boxes.

Soil samples were analyzed by the Curtis and Tompkins (C&T) laboratory located in Berkeley, California. C&T is a California certified environmental testing laboratory for the sample analyses performed. Analyses were performed for OCPs, metals, asbestos and PCBs. Arsenic concentrations were below the screening level (12 milligrams per kilogram (mg/kg)) in all six soil samples analyzed for arsenic. Lead was below the screening level (80 mg/kg) in all eleven soil samples analyzed for lead with a maximum concentration detected of 49 mg/kg.

PCBs were not detected in the soil sample analyzed for PCBs at a maximum detection limit for any of the Arochlors of 24 micrograms per kilogram. Dieldrin exceeded the screening level of 33 micrograms per kilogram in eight of the 31 total samples. Chlordane exceeded its screening level in 2 of 31 soil samples collected. Each exceedance was at a location where the dieldrin screening level was also exceeded. No other OCP exceeded its screening level. The OCP exceedances were all located within the planter boxes on either side of the front door of the school.

Amphibole asbestos was detected in five of eight base rock samples. All five of the samples with detectable asbestos fibers exceeded by 0.001% by weight asbestos. NOA for the subject Site appears to be restricted to base rock brought on to the Site to be placed beneath the playgrounds and parking areas, and potentially the school building.

Exposure pathways of concern are direct contact with soil impacted with OCPs for students, faculty and staff of the future Laurel School Upper Campus. Construction and maintenance workers may also be at risk for inhalation and direct contact risk for asbestos and OCPs during grading activities. Since the site was never used for retail or manufacturing, volatile organic compounds are not a constituent of concern. The constituents of concern however at the Site (OCPs, lead from lead-based paint, and asbestos fibers) are not significantly mobile in the environment and would not be expected to reach groundwater at the Site at 23 feet bgs. NOA is not considered a constituent of concern in any outlet except in imported base rock.

To summarize Terraphase's findings, OCPs are present in the soil in the planters at the front of the existing school building. Naturally-occurring asbestos is present in the base rock below the asphalt surfaces at the Site and potentially below the existing school building.

Terraphase recommends the OCP impacted soils should be removed and disposed of in an off-site landfill – the total volume of soil to be disposed of off-site is approximately 12 cubic yards. One foot of soil will be excavated from the northwest and southeast planters. This soil is not a hazardous waste based on the OCP and lead results and can be disposed of in a

solid waste landfill. Two confirmation soil samples will be collected from the excavation areas. If a sample is found to have OCPs at concentrations above the screening levels an additional six inches of soil will be excavated from the planter. Upon obtaining confirmation of sample results meeting screening levels the excavations will be backfilled with clean fill. Terraphase also recommends radon testing should be conducted in the existing school buildings to assess if vapor barriers are needed for the new school.

There are approximately 3,000 tons of NOA-impacted base rock at the existing school. The total cost to remove the NOA-impacted base rock would be approximately \$300,000. This cost is excessive in comparison to the environmental benefit that would be obtained from the base rock's disposal. Hence, the District has determined that the base rock will be consolidated under the sports fields to be constructed for the new school. The consolidated base rock will be covered with an orange separation geotextile and by a minimum of 12 inches of soil cover. The soil cover will be vegetated except in the baseball and softball field infields. The consolidated base rock will be monitored in perpetuity to verify the cover system is functioning as designed.

No Further investigation is required. Upon completion of mitigation of the OCP and NOA impacted soils, a PEA Addendum Report will be submitted to the DTSC for final approval.

1.0 INTRODUCTION

On behalf of Menlo Park City School District (the “District”), Terraphase Engineering Inc. (Terraphase) has prepared this Preliminary Endangerment Assessment (PEA) Report (the “PEA Report”) for the property located at 275 Elliott Drive, Menlo Park, California (the “Site”). The Site is comprised of one parcel located in Menlo Park, San Mateo County, California. The property is approximately 6 acres in size and is identified with the Assessor’s Parcel Number (APN): 063-430-310 by the San Mateo County Assessor. A Site Location Map is included as Figure 1; a map showing the vicinity features is shown on Figure 2. The District intends to redevelop the Site as the Laurel School Upper Campus.

This PEA Report was prepared by Terraphase for submittal to the California Environmental Protection Agency (Cal-EPA) Department of Toxic Substances Control (DTSC). This PEA Report was prepared in general accordance with the Preliminary Endangerment Assessment (PEA) Work Plan prepared for the Site (Terraphase 2014) and the guidelines of the DTSC, as detailed in the PEA Guidance Manual (DTSC 2013).

1.1 Purpose and Objectives

The PEA is intended to identify whether a release or threatened release of hazardous substances exists at the Site and to evaluate the potential risk to human health or the environment before the DTSC issues a “No Further Action” designation.

The overall objectives of the PEA include the following:

- evaluate historical information regarding the past use, storage, disposal, or release of hazardous wastes/substances at the Site;
- conduct a field sampling and analysis program to characterize the nature, concentration, and extent of hazardous wastes/substances present in soil at the Site; and
- estimate the potential threat to public health and/or the environment posed by known hazardous constituents at the Site using a residential land use scenario.

The ultimate objective of this PEA is to provide the DTSC with sufficient site information and the results of a screening human risk evaluation conducted in accordance with DTSC’s PEA Guidance Manual (DTSC 2013) so that the DTSC can make an informed decision regarding potential risks, if any, posed by the Site. Based on this PEA, DTSC may:

- require further assessment through the remedial investigation/feasibility study process if the Site is found to be significantly affected by hazardous substances;

- require the District to perform a removal action for areas where localized impacts by hazardous substances release(s) are found; or
- issue a “No Further Action” finding if the Site is found not to be affected or if risks to human health and the environment are found to be within acceptable levels based on the screening-level risk assessment.

1.2 Scope of Work

This PEA is intended to identify whether a release or threatened release of hazardous substances exists at the Site and to evaluate the potential risk to human health or the environment so that mitigation can be performed, if required, so that the DTSC can issue a “No Further Action” designation for the Site and it can be developed as a school.

To meet the PEA objectives, Terraphase performed the following work:

- prepared a Phase I Environmental Site Assessment (Appendix A; Terraphase 2014a) in accordance with the methodology of ASTM Standard Practice E 1527-13;
- conducted a field sampling and analysis program to characterize the nature, concentration, and extent of hazardous wastes/substances present in soil at the Site; and
- estimated the potential threat to public health and/or the environment posed by known hazardous constituents at the Site using a residential land use scenario.

1.3 Significant Assumptions

No significant assumptions that would significantly impact the results of the screening human health risk assessment were made during the preparation of this PEA. An ecological risk assessment was not conducted, as the Site is not a suitable habitat for ecological receptors.

1.4 Modifications or Deviations

No significant deviation from ASTM 1527-13 guidelines, for the Phase I Environmental Site Assessment portion of the work, or the DTSC PEA Guidance manual occurred.

1.5 Information Provided by the Landowner

District provided information is summarized in Section 3.0 of the Phase I ESA (Terraphase 2014a) which is attached as Appendix A to this PEA. An interview with the Site custodian was conducted as documented in Appendix B to the Phase I ESA (Terraphase 2014a) which is attached as Appendix A to this PEA.

1.6 Other Site Information

An Environmental Data Resources (EDR) report was obtained for the Site (Appendix B of the Phase I ESA (Terraphase 2014a) which is attached as Appendix A to this PEA.

2.0 SITE DESCRIPTION

This section describes the location and ownership of the site as well as other pertinent details required by DTSC regarding the specifics of the site description.

2.1 Site Identification

The Site is approximately 6-acres in size and is addressed as 275 Elliot Drive in Menlo Park, San Mateo County, California 94025. The property is identified with the Assessor's Parcel Number (APN): 063-430-310 by the San Mateo County Office of the Assessor. A copy of the assessor's map is included in Appendix A. The Site is identified with the following coordinates in the geographic NAD83 coordinate system:

Latitude: 34.4577

Longitude: -122.1483

2.1.1 Site Name

The German American International School, a private primary and secondary school (kindergarten through 8th grade) has leased the Site since 1991 and is currently in operation at the Site.

2.1.2 Contact Person

The contact person for the School District is:

Ahmad Sheikholeslami, P.E.
Chief Business and Operations Officer
Menlo Park City School District
181 Encinal Ave - Atherton CA - 94027
Office: 650-321-7140 ext 5614
Mobile: 650-303-6230

2.1.3 Site Description

The Site is located approximately 2.1 miles northwest of downtown Palo Alto, California and about 2 miles southwest of the San Francisco Bay (Figure 1). The Site is located in an area of predominantly residential use and is surrounded by single family houses, most of which appear to have been constructed in the 1950s and 1960s.

The main school building at the Site is approximately 14,000 square feet in size. It is located in the southwestern corner of the property. Based on aerial photograph review, this building was constructed at the Site in the late 1950s. The building foundation appears to be concrete block which comes approximately 2 feet above ground with presumably wood

structure above. An overhanging roof extends approximately 4 feet beyond the exterior walls of the building on all four sides. Located beneath the roof overhang is a concrete path that surrounds the building on three sides. Based on construction drawings and the concrete type, it appears the concrete pathway is original to the building.

Two planting beds separated by a pathway to the principal's office are present at the front of the school building. One bed is approximately 30 feet long by 3 feet wide and the other is approximately 6 feet long by 3 feet long. A break in the roof overhang over the planting beds allows sunlight to reach the plants in the bed.

Two pole-mounted transformers were observed adjacent to the Site: one on a pole located at the western property boundary and one on a pole located at the eastern property boundary. Both transformers are considered off-Site.

To the west and north of the main building are blacktop and playground areas used by the school for outdoor recess and afterschool play. The eastern portion of the Site is occupied mostly by a ball field. The ball field is generally well maintained with some areas of bare grass noted during a Site visit. Tennis courts are located along the southern central boundary of the Site. One of the tennis courts currently has a modular classroom structure (discussed below) and a play area located over the surface. The other tennis court is in poor condition and does not appear to be used.

The German American International School has brought six modular classroom units to the Site over the past 20 years to house their growing operations. In general, the modular classroom buildings were observed in good condition with no peeling paint observed. Based on aerial photograph review, the three oldest modular classrooms were brought to the Site at some point between 1993 and 1999. Information on the manufacture date of these modular classroom buildings was not available. However, information obtained from a serial number on the air conditioning units that appear to be original to the structures indicates that the air conditioning units were manufactured in 1997. In addition, a plaque on the modular classroom structure currently used as the gymnasium shows a date of 1997. Two more modular classrooms were brought to the Site in 2007 or 2008. The last modular classroom building was brought to the Site in early 2010.

A concrete pad with an electrical panel is present behind one of the older modular classroom buildings. The electrical panel is connected to one of the off-Site, pole-mounted transformers located on the eastern boundary of the Site. It appears the electrical panel and the concrete pad on which it sits are associated with only the modular classrooms and were not present at the Site prior to the modular structures (i.e., before 1993).

The German American International School has also brought four portable storage units to the Site during the past 20 years. The two oldest portable storage containers are located

adjacent to the modular gymnasium building. Based on aerial photographs, the first unit was placed to the west of the gymnasium in early 2003. The second unit located behind the gymnasium building was not visible until the 2007 aerial photograph. The two units located on the eastern end of the Site were not present in their current positions until 2010. In general, the portable storage units were observed in good condition with the exception of the one portable storage container located behind the gymnasium. Peeling paint was observed on the surface of this portable unit.

2.2 Site Geology and Hydrogeology

A geotechnical investigation of the Site was conducted by the Bay Area Geotechnical Group (BAGG 2014). BAGG found:

...the presence of inter-layered and inter-fingered deposits of gravels, sand, silt, and clay, and their mixtures, typical of alluvial deposits. The soil boring drilled at the site indicate the presence of stiff to very stiff lean clays and sandy lean clays in load bearing zones for the proposed buildings with the exception of Boring B-7 which revealed the presence of medium dense clayey sand with gravel between 8 to 11 feet bgs. Based on the results of the Atterberg Limits tests performed on the near surface soil samples, the near surface soils were judged to be moderately plastic.... With the exception of Boring B-7, only the deeper borings (B1 and B2) revealed the presence of granular soil deposits. Boring B-1 revealed the presence of loose to medium dense clayey sand between 23 to 25½ feet bgs, medium dense sandy gravel between 36½ to 39 feet, medium dense silty sand between 39 to 42 feet, medium dense clayey sand between 42 to 44½ feet and medium dense silty sand between 47 to 49 feet followed by very dense sandy gravel to the maximum depth of drilling. Boring B-2 revealed the presence of medium dense, well-graded sand between 40 to 44½ feet bgs.Free groundwater was encountered at approximately 23 feet bgs in the soil borings drilled at the site. As indicated earlier, the Seismic Hazard Zone Report for Palo Alto Quadrangle indicates the depth to historical high groundwater at the site to be between 10 to 20 feet below ground surface.

The nearest surface water bodies are the San Francisquito Creek located approximately 550 feet south of the Site and the San Francisco Bay located approximately 1.84 miles northeast of the Site. Two municipal water supply wells and an above ground water tank (owned and operated by the O'Connor Tract Water Coop) are located approximately 250 feet southwest of the Site.

3.0 BACKGROUND

3.1 Site Status/Historical Site Information

According to the Phase I ESA (Terraphase 2014a), the Site was used for small-scale agricultural purposes until the 1950s. The historical aerial photographs included in the Phase I ESA show a series of separate fields. Orchards are visible on at least a portion of two of these fields. The agricultural uses of the other fields are not known. Figure 3 shows the former agricultural fields at the Site as seen in the 1956 aerial photograph.

Although the exact date is not known, the ownership of the Site was transferred to the Ravenswood City School District presumably in the 1950s. According to the Menlo Park City School District:

website:[http://district.mpcsd.org/modules/groups/homepagefiles/cms/1602720/File/OCO NNOR%20FAQ%205.3.13%20FINAL.htm?sessionid=a11bf51b3405ae2d554126b9d954a701](http://district.mpcsd.org/modules/groups/homepagefiles/cms/1602720/File/OCO%20NNOR%20FAQ%205.3.13%20FINAL.htm?sessionid=a11bf51b3405ae2d554126b9d954a701).

The Site was developed as the O'Connor School in the 1950s with the main building structure still present today. The ball field was located in the same location. No other structures are visible at the Site in the aerial photographs from the late 1950s through the early 1990s. According to the Charles Armstrong School website:

(<http://www.charlesarmstrong.org/index.php?page=our-history>), the Site was the location of the Charles Armstrong School, a school for dyslexic students, from 1974 until 1978.

In 1983, voters passed Measure "A" transferring the neighborhood in which the Site is located from the Ravenswood City School District to the Menlo Park City School District. In the mid to late-1980s, the Site was used as the location of the Cancer Support and Education Center. In 1991, the German American International School took occupancy of the Site for use as a private school.

3.1.1 Owner, Property Manager and Occupant Information

The current Site owner information is as follows:

Menlo Park City School District
181 Encinal Ave.
Atherton, California 94025
Contact: Ahmad Sheikholeslami
Phone Number: (650) 321-7140

3.2 Hazardous Material/Substance/Waste Management Information

No manufacturing activities were identified as having occurred at the Site. Wastes currently generated at the Site consist of general trash. The Site is not currently nor has it been in the

past, subject to any federal, state or local permits. Terraphase is not aware of any prior assessments, sampling, or cleanup activities that have been conducted at the property.

Terraphase understands that the base rock below the asphalt parking lots and playgrounds, and potentially under the original school building, is impacted with naturally-occurring asbestos (NOA) – the base rock was imported to the Site from a local quarry and is not therefore believed to be widespread at the Site or currently exposed in the environment.

3.3 Current and Historical Uses of Surrounding Properties

The Site was used for agricultural purposes before 1957 and school purposes after 1957 (Terraphase 2014a). Historical use information is presented in Section 4.4 of the Phase I ESA (Terraphase 2014a) which is appended to this PEA in Appendix A.

3.4 All Appropriate Inquiries Information

3.4.1 Specialized Knowledge

There were no extra files related to the site beyond what has already been discussed in the appended Phase I ESA report (Terraphase 2014a).

3.4.2 Commonly Known or Reasonably Ascertainable Information

No additional commonly known or reasonably ascertainable information exists for the property, beyond that which is available to the public through public agencies and freedom of information act requests.

3.4.3 Valuation Reduction for Environmental Liens

No information was provided to ascertain if the price of the property reasonably reflects the fair market value however, no environmental liens have been found for the property.

3.5 Records Review Information

3.5.1 Land Records

3.5.1.1 Title Record

According to the San Mateo County Planning Department, the tax use code for the property is listed as “School.” A title search was not conducted as the Site has been owned by the school district since the 1950s.

3.5.1.2 Environmental Liens and Activity and Use Limitations

Please see Section 4.4.4 of the appended Phase I ESA report (Terraphase 2014a).

3.5.2 Aerial Photograph Review

Section 4.4.1 of the appended Phase I ESA (Terraphase 2014a) provides a review of aerial photographs of the Site dating between 1939 and 2012.

3.5.3 Historical USGS Topographic Map

Section 4.4.5 of the appended Phase I ESA (Terraphase 2014a) provides a review of historical topographic maps containing the Site dating between 1899 and 1997.

3.5.4 City Directories

Section 4.4.6 of the appended Phase I ESA (Terraphase 2014a) provides a review of historical city directories containing the Site Address.

3.5.5 Standard Environmental Record Sources

Terraphase (2014a) reviewed the DTSC Envirostor database, the San Francisco Bay Regional Water Quality Management District (SFRWQCB) Geotracker database and the files of the San Mateo County Health System Environmental Division. No significant environmental information regarding the Site or adjacent properties was found in these sources. Section 7.8 of the Phase I ESA (Terraphase 2014a) discusses the ¼ mile survey conducted for the Site for facilities listed by the Bay Area Air Quality Management District as being hazardous substance air-emitters. No sources were found within ¼ miles of the Site.

The Site was not included on any historical Sanborn Fire Insurance Maps.

3.6 Site Reconnaissance

On January 8, 2014, Ms. Jenifer Repa of Terraphase visited the Site. Ms. Repa was accompanied by Mr. Tim Farris, the custodian of the German-American school. Mr. Farris, has been employed with the school for 5 years and was able to show most of the property. Select photographs taken during the Site reconnaissance are provided in Appendix D of the appended Phase I ESA (Terraphase 2014a).

3.7 Interviews

Tim Farris, the Site custodian was interviewed (see Appendix B of Terraphase 2014a). Mr. Farris was unaware of any present or past environmental issues at the Site.

4.0 APPARENT PROBLEM

There are four issues driving the preparation of this PEA Report:

- The District has found that base rock used at some of their schools constructed in the same era as the Site school were contaminated with NOA – the base rock was imported to the Site from a local quarry and is not therefore believed to be widespread at the Site or currently exposed in the environment;
- The potential presence of lead-based paint in the soil surrounding the existing structures at the Site;
- The potential presence of termiticides in the soil surrounding the existing school structures; and
- The Site was formerly used for agricultural purposes and hence agricultural chemicals are a potential chemical of concern at the Site.

On March 6, 2014, representatives of Terraphase, the DTSC, and the Menlo Park City School District conducted a Site walk. The DTSC project manager, Mr. Neal Hutchison, identified potential additional sampling areas at the Site depending on the age of certain features of the Site. These additional sampling locations included:

- Sampling around the older modular classroom buildings if they were placed at the Site and/or manufactured prior to 1993. Additional information obtained from historical aerial photographs indicates that these structures were placed at the Site after 1993 and appear to have been constructed in 1997 and placed at the Site after that date.
- Sampling of shallow soil around the concrete pad of the electrical panel located behind the modular classrooms. Since this panel was not placed at the Site until the 1990s, it is unlikely that the panel would contain PCB-containing materials since the use of these materials was phased out in 1979. Photographs taken of the interior of the electrical panel indicated it is a Square D Speed-D SB 126IR Switchboard electrical switchboard. According to a representative of the manufacturer, Square D switchboards do not contain PCBs.
- Sampling of shallow soil around the portable storage unit located behind the gymnasium where peeling paint was observed.
- Sampling of shallow soil beneath the windows over the front planting bed to assess the potential for PCB-containing window caulking material.

5.0 ENVIRONMENTAL SETTING

5.1 Conceptual Site Model

A Site Conceptual Exposure Model depicting the potential sources of contamination, transport mechanisms, exposure routes and receptors is depicted on Figure 4. The model identifies the potential sources of contamination including the existing school building, NOA in imported fill materials, and former agricultural use. Potential exposure routes to the identified receptors include ingestion, inhalation and/or dermal contact with affected soil.

There are no volatile constituents of concern (COC) so the airborne pathway is limited to dust. There are no significant environmental receptors in the Site vicinity so there are no significant environmental threats.

Terraphase's experience with school gardens is that they are typically placed in raised beds using imported clean topsoil. Hence, exposure to contaminants in produce produced at the Site is not considered a complete pathway.

The Site is supplied with drinking water from the local water utilities, hence, exposure to groundwater is not considered a complete pathway. There is no indication of a regional groundwater plume of volatile compounds, so off-gassing of volatiles is not considered to be a complete pathway.

There are no surface water conduits at the Site, so exposure to contaminants in surface water is not considered to be a complete pathway.

5.2 Factors Related to Soil Pathways

5.2.1 Site Topography

The Site is relatively flat. The Site is situated approximately 37 feet above sea level. The local topography shows a gradual downward incline to the northeast at approximately 1 foot per 100 feet.

5.2.2 Site Geology and Soil Types

Brabb, Graymer and Jones (1998a) map the Site as lying on Natural Levee Deposits (Holocene) which are described as:

Loose, moderately to well-sorted sandy or clayey silt grading to sandy or silty clay. These deposits are porous and permeable and provide conduits for transport of ground water. Levee deposits border stream channels, usually both banks, and slope away to flatter floodplains and basins.

Abandoned levee systems, no longer bordering stream channels, have also been mapped,

This description is consistent with the BAGG (2014) borehole results described in Section 2.2 above. One of BAGG's geological cross-sections for the Site is reprinted in this PEA report as Figure 5. As shown on Figure 5, the upper 23 feet of the Site subsurface consisted of almost entirely low-plasticity clays at the locations of the BAGG borings. We expect the soil will not have a high hydraulic conductivity and that water percolation at the Site will be very slow.

Besides stormwater drains in the street and one storm drain inlet shown on the existing conditions map of the facility on the north side of the main school building, no other storm drains were observed on the property. At the time of Terraphase's Site visit, there were sandbags lined up outside of the front of the northwest end of the main school building (the preschool). The sandbags were placed there by the custodian after the last big rain storm because drainage in that area is poor and there was a danger of flooding the front classrooms.

5.2.3 Site Accessibility

The Site is open and accessible except during school hours when students are present when normal precautions are taken to restrict access to the site to authorized individuals.

5.2.4 Proximity to Nearby Receptors

The Site is surrounded by single family homes with apartment complexes in close proximity. The nearest school is the German American School located on the property, though there are numerous other private and public schools located within one mile of the Site. There are a number of senior living facilities on University Avenue in Palo Alto located approximately 3/4's mile from the Site (Webster House, Lytton Gardens, Avenidas). The Veterans Administration hospital in Menlo Park is located 0.66 miles northwest of the Site. The nearest known pre-school to the Site is Footsteps Preschool located at 490 Willow Road 0.4 miles west of the Site.

San Francisquito Creek is located 0.1 miles south of the Site. The creek is habitat for the federally threatened steelhead (*Oncorhynchus mykiss*) and California red-legged frog (*Rana aurora daytonii*). Wetlands on the margin of San Francisco Bay are located 1.25 miles to the east northeast of the Site.

5.3 Factors Related to Water Pathways

No release or threatened release of hazardous substances/materials to water was identified at the Site.

5.4 Factors Related to Air Pathways

No release or threatened release of hazardous substances/materials to air was identified at the Site. COCs (NOA, lead, pesticides) could be released to the atmosphere as dust during grading at the Site. It is unlikely that significant amounts of COCs could reach off-site receptors because of the BAAQMD requirements to prevent visible dust from leaving a Site during grading operations and the relatively low COC concentrations detected in samples of Site soils. However, workers could potentially be exposed during grading activities at the Site.

Please see Section 5.2.4 for the locations of nearby sensitive receptors.

6.0 SAMPLING ACTIVITIES AND RESULTS

6.1 Summary of Activities

Soil samples were collected and analyzed to assess the following:

- Potential organochlorine pesticide (OCP)-affected soil on-site and around the perimeter of the main school building (constructed in 1957). One three-point composite sample from the shallow soil (0 to 6 inches below ground surface [bgs]) and one three-point composite of deeper soil (3 to 3.5 feet bgs) were collected. Soil used for the composite was collected from within the soil beds and from beneath the asphalt area adjacent to the west side of the building. The reason for only one sample is that the concrete pathway surrounding the building appears to be original and no disturbance of the concrete surface was noted during the Site walk.
- Potential lead-based paint-affected soil around the perimeter of the main school building constructed in 1957 and around the perimeter of the portable storage unit located behind the gymnasium, as it was observed to be in poor condition with peeling paint. A total of eight discrete soil samples for lead analysis were collected from the shallow soil surface (top 0 to 6 inches bgs) surrounding the building. Six sample locations were located within the drip line of the building and two additional sample locations were located in the planting beds below the roof opening. Four discrete samples for lead analysis were collected from the accessible areas surrounding the portable storage unit.
- Arsenic and pesticides in soil across the Site from historic agricultural use. A total of six discrete samples were collected for arsenic analysis and six composited soil samples were collected for analysis for OCPs. Composited samples consisted of two-point composites collected from shallow soil (top 0 to 6 inches). Composited samples were collected from the same historical agricultural fields identified in the historical aerial photographs, as well as in areas around buildings where suspect termiticides may have been applied to shallow soils. In cases where sample locations were located beneath asphalt, samples were collected from the soil encountered below any aggregate material used as base material for the asphalt.
- Polychlorinated biphenyls (PCBs) samples were collected from shallow soil (0 to 6 inches bgs) located directly beneath the window where the roof opening is located to evaluate for potential PCB-containing window caulking material.

During the investigation activities, when sample locations were located within the parking lot or adjacent to buildings (i.e., areas where fill materials are most likely to be present based on historical topographic maps), the field geologist assessed the soil for the potential presence of NOA containing rock (blue green color) that might have been used as the

aggregate base beneath buildings or parking areas. Samples of the aggregate base were collected and submitted for analysis of asbestos. This work was conducted under the oversight of a California Professional Geologist.

The initial round of samples (28) were collected on April 14 and 15, 2014 and submitted to Curtis & Tompkins Laboratories (C&T) in Berkeley, California for arsenic, lead, PCB and OCP analyses – not every sample was analyzed for every chemical of concern (COC). C&T is certified by the State of California to perform metals analyses using USEPA Method 6010, PCBs using USEPA Method 8082 and OCP analyses using Method 8081. Eight samples of base rock were submitted to the Asbestos TEM Laboratories also in Berkeley for asbestos analysis using the California Air Resources Board (CARB) 435 PLM 400 PC Method. Subsequently, the base rock samples were analyzed using EPA Test Method for the Determination of Asbestos in Bulk Building Materials – Transmission Electron Microscopy (TEM) method (EPA 600/R-93/116) modified for quantitative bulk soil sample analysis.

On June 7, 2014, an additional 18 step out soil samples were collected for analysis of OCPs (the analysis was performed at the C&T laboratory in Berkeley, California. Discrete samples were collected from borings B13, B14, and B15 at depths of 0 to 0.5 feet bgs and 1 to 1.5 feet bgs located along the northeastern and southeastern sides of the building. Borings were located at the base of the building foundations (within 2 feet) to evaluate OCP concentrations and possible termiticide application. Coring through the concrete walkway that surrounds the building was required. The samples were collected using a hand auger.

Discrete samples were collected from the previous boring location B9 at depths of 0 to 0.5 feet bgs and 1 to 1.5 feet bgs to evaluate dieldrin concentrations detected in the previous B7, B8 and B9 composite sample.

Discrete samples were collected from the previous boring locations B7 and B8 at depths of 1 to 1.5 feet bgs to evaluate vertical extent of elevated dieldrin concentrations detected at these locations.

Discrete samples were collected from step-out locations B7A, B8A, B8B, and B8C at depths of 0 to 0.5 feet bgs and 1 to 1.5 feet bgs to assess the lateral and vertical extent of dieldrin within the planter boxes. Given historical application practices of termiticides, it is assumed that the termiticide application likely occurred throughout the planter box as this was the most easily accessed area around the building due to the presence of a concrete walkway surrounding the building on three sides. Therefore, step-out locations were collected from just outside the perimeter edges of the planter boxes.

Sample locations for samples collected to assess agricultural and suspect termiticide impacts to the Site are shown on attached Figure 6. Sample locations for samples collected to assess building materials impacts to the Site are shown on attached Figure 7.

Sampling was not deemed necessary around the modular classroom buildings since it appears the oldest of these structures were manufactured in 1997 and placed at the Site in the same year. Sampling around the concrete pad of the electrical panel behind the modular classrooms is not warranted since this unit is associated only with the modular classrooms and was not present at the Site prior to 1997. Similarly, samples of the soil around the remaining portable storage units is not warranted since these units have been located at the Site only five years or less.

6.2 Presentation of Data

6.2.1 Sample Collection

Terraphase collected soil samples using hand-sampling equipment (a hand auger). Samples were collected from the auger bucket. The soil samples were placed directly into laboratory-supplied, pre-cleaned glass jars and labeled properly. The hand auger was decontaminated between each sampling location.

After labeling, the soil samples were sealed in plastic bags and placed in an ice-chilled cooler for transportation to the laboratory under proper chain-of-custody protocols. Analytical methods, types of containers, preservation methods, and holding times are listed in Table 3.

6.2.2 Surveying

Terraphase located each boring location using a handheld global positioning system unit during the field activities.

6.2.3 Sample Identification

Samples were numbered using the boring identification number followed by the sampling depth interval. For instance, a discrete sample collected from location B-1 at a depth of 0 to 0.5 ft bgs was labeled: B-1-0-0.5. A composite of samples from B-1 and B-2 collected at depths of 0 to 0.5 ft bgs was labeled: B-1/B-2-0-0.5. Sample labels were filled out with indelible ink and affixed to each sample container. Non-waterproof sample labels were covered with clear tape. Sample containers were placed in resealable plastic bags to protect the sample from moisture during transportation to the laboratory. Each sample container was labeled with the following, at a minimum:

- Sample identification number
- Sample collection date (month/day/year)
- Time of collection (24-hour clock)
- Project number
- Sampler's initials
- Analyses to be performed

- Preservation (if any)
- Location (i.e., site name)

6.2.4 Packaging and Shipping

After sample collection, sample labels were affixed to each sample container. Each sample was placed in a resealable plastic bag to keep the sample container and the label dry. All glass sample containers were protected with bubble wrap (or other cushioning material) to prevent breakage. A temperature blank was placed in every cooler with samples.

Samples were packed in a sample cooler. Wet ice (double-bagged in resealable bags), blue ice, or gel packs were added to the cooler in sufficient quantity to keep the samples cooled to 4°C, plus or minus 2°C, for the duration of the shipment to the laboratory. Sample cooler drain spouts were taped from the inside and outside of the cooler to prevent any leakage.

6.2.5 Field Quality Assurance/Quality Control Procedures

6.2.5.1 General

The following field QA/QC procedures were performed at the Site:

- Chain-of-custody forms were used when submitting samples to the laboratory.
- Daily information regarding soil sample collection was recorded in a field logbook or on field sampling information forms. Sample types, sample identification numbers, and sample times were collected and recorded on field sampling information forms and/or in field logbooks. Pages were numbered, dated, and signed by the person recording the field data.

Duplicate samples were not collected due to the small size of the data sets.

6.2.5.2 Sample Custody

A chain-of-custody record accompanied the sample shipments for analyses. Forms were completed and sent with the samples for each laboratory and each shipment. If multiple coolers are sent to a single laboratory on a single day, individual chain-of-custody forms were completed and sent with the samples in each cooler.

The chain-of-custody records the contents of each shipment and maintains the custodial integrity of the samples. Information contained on the chain-of-custody record includes the sampler's name; date and project number of the sampling event; sample number; date and time of sample collection; sample type; number of containers associated with each sample; analyses requested; and the names, dates, and times of custody.

6.2.6 Laboratory Quality Assurance/Quality Control Procedures

Laboratory QA/QC procedures include the following:

- Laboratory analyses were performed within the required holding time for samples submitted for initial analysis and samples being held for analysis based on the results of the initial analyses.
- Appropriate minimum reporting limits were used for each analysis.
- The analytical method proposed for arsenic analysis will provide a detection limit sufficient for residential risk evaluation purposes.

The laboratory will report the following information for each sample delivery group as follows:

- a discussion of how the QA/QC criteria were met by the laboratory
- a discussion of hold times
- matrix spike/matrix spike duplicate results
- relative percent difference
- method blank data
- surrogate recovery, instrument tuning, and calibration data
- exceptions
- signed laboratory reports, including the sample designation, date of sample collection, date of sample analysis, laboratory analytical method employed, sample volume, and the minimum reporting limit (any discrepancies were detailed in a letter provided by the laboratory)

Terraphase used C&T, a California-certified environmental testing laboratory for the sample analyses.

The results of the soil sample analyses are presented in attached Tables 1 (OCPs), 2 (metals and PCBs) and 3 (asbestos).

6.3 Discussion of Results

6.3.1 Metals

Arsenic was below the screening level (12 milligrams per kilogram [mg/kg]) in all six soil samples analyzed for arsenic. Lead was below the screening level (80 mg/kg) in all eleven soil samples analyzed for lead with a maximum concentration detected of 49 mg/kg.

6.3.2 PCBs

PCBs were not detected in the soil sample analyzed for PCBs at a maximum detection limit for any of the Aroclors of 24 micrograms per kilogram (ug/kg). The lowest screening level for a PCB Aroclor was 110 ug/kg for Aroclor-1254.

6.3.3 OCPs

Dieldrin exceeded the screening level (33 ug/kg) in eight of 31 total samples. Chlordane exceeded its screening level in 2 of 31 soil samples collected (each of the exceedances was at a location where the dieldrin screening level was also exceeded). No other OCP exceeded its screening level. The OCP exceedances were all located within the planter boxes on either side of the front door of the school (approximately 10.4 cubic yards of soil are impacted).

6.3.4 Asbestos

Amphibole asbestos was detected in five of eight base rock samples. All five of the samples with detectable asbestos fibers exceeded 0.001% by weight.

Base rock in the Menlo Park area is known to be impacted by naturally-occurring asbestos (NOA). In addition to the base rock, there is a patch of serpentinite (commonly associated with NOA) of approximately 150 acres within the San Francisquito Creek watershed (Brabb Graymer and Jones 1998b) – there is a much larger area of serpentinite to the north, but it is in a different watershed than the Site. San Francisquito Creek has a watershed of 37 square miles (United States Army Corps of Engineers 2015). Hence the serpentinite in the watershed is 0.6% of the total land area.

The NOA for the subject site appears to be restricted to base rock brought on to the site to be placed beneath the main building and parking areas, a common construction practice – the base rock was imported to the Site from a local quarry and is not therefore believed to be widespread at the Site or currently exposed in the environment. Based on a review of other school sites in close proximity which went through similar studies under DTSC review and oversight, the DTSC concurs with our findings and mitigation plans, as discussed later in this report.

7.0 HUMAN HEALTH SCREENING EVALUATION

7.1 Exposure Pathways and Media of Concern

As shown on Figure 4, the exposure pathways of concern are direct contact with soil impacted with OCPs for students, faculty and staff of the future Laurel School Upper Campus as well as construction and maintenance workers and inhalation and direct contact risk for asbestos and OCPs by construction workers during grading operations.

The media of concern are the soil in the planters around the building and the base rock below the asphalt surfaces and potentially below the building footprint.

The Site is not located near a known release of hazardous chemicals and the Site has never been used for retail or manufacturing purposes. Hence, our opinion is that volatile organic compounds (VOC) are not a constituent of concern at the Site and hence vapor intrusion is not an exposure pathway of concern.

The constituents of concern at the Site (OCPs, lead from lead-based paint, and asbestos fibers) are not significantly mobile in the environment and hence would not be expected to reach groundwater at the Site 23 feet below the ground surface (BAGG 2014). As indicated in the previous paragraph, the Site is not near a known release of hazardous chemicals that might have migrated under the Site. The site is serviced by a public water utility and there are no wells on the Site. Hence, our opinion is that groundwater is not a media of concern at the Site.

As indicated earlier, Terraphase's experience with school gardens is that they are typically placed in raised beds using imported clean topsoil fill. Hence, exposure to contaminants in produce produced at the Site is not considered a complete pathway.

According to the California Department of Public Health Radon Database (CDPH 2010), 21 of 101 total radon measurements in the 94025 zip code have exceeded 4 picoCuries/liter.

Because of the small area of serpentinite within the San Francisquito Creek watershed, NOA is not considered a constituent of concern in any media at the Site other than the imported base rock.

7.2 Exposure Concentrations and Chemicals

For the purpose of this screening assessment, we have used the maximum detected concentration of each of the constituents of concern.

7.3 Human Health Screening Levels

The screening levels presented in Tables 1 and 2 are the lower of the California Human Health Screening Level (CHHSL) (California Environmental Protection Agency 2005) or Regional Screening Level (RSL) (U.S. EPA 2015b) as modified by the California Department of Toxic Substances Control in Office of Human and Ecological Risk (HERO) Note 3 (DTSC 2014).

The assumptions used to calculate the RSLs for residential exposure include 26 years (6 as a child) of exposure, 350 days a year for 24 hours per day. The RSLs are based on a direct soil intake of 100 mg per day of soil (200 mg per day for children). None of these assumptions is actually applicable to school children exposure as they will only be exposed to Site soils for six hours per day, 180 days per year for six years.

According to DTSC (2004), the TEM-based criterion for NOA in soils is 0.001% by weight. This represents the concentration where DTSC may require further action at school sites, depending upon the frequency and location of soil samples exceeding this concentration. The asbestos found during the TEM study consisted of amphibole asbestos rather than the crocidolite normally associated with serpentinite. While there is some expert disagreement (see Health Canada 2008) regarding the relative carcinogenicity of amphibole versus crocidolite asbestos, the amphibole variety is believed to be much more likely to cause mesothelioma than is crocidolite asbestos.

The DTSC fence line trigger level for asbestos is 0.005 fibers per cubic centimeter. DTSC refers to a nominal value of 0.01 fibers per cubic centimeter (PCM) or less as being listed as the measure of work site cleanliness by USEPA.

7.4 Toxicity Values

Exposure to dieldrin can cause cancer in animals. No study of humans exposed to dieldrin has found significantly elevated cancer levels. U.S. EPA classifies dieldrin as B2; probable human carcinogen (U.S. EPA 2015a). The cancer slope factor for dieldrin is 16 kg-day/mg.

Exposure to chlordane can cause cancer in animals. No study of humans exposed to dieldrin has found significantly elevated cancer levels. U.S. EPA classifies chlordane as B2; probable human carcinogen (U.S. EPA 2015a). The cancer slope factor for chlordane is 0.35 kg-day/mg. The lower the slope factor, the less hazardous the material is.

Exposure to asbestos is known to cause asbestosis, lung cancer, and mesothelioma. The U.S. EPA has classified asbestos as a group A human carcinogen (U.S. EPA, 1993), and estimates an inhalation unit risk of 2.3×10^{-1} per fiber per milliliter (ml) of air. This translates to a risk of one case of asbestos-triggered cancer in 1,000,000 people for lifetime exposures (70 years for 24 hours per day) of 4×10^{-6} fibers per ml of air.

7.5 Risk Characterization Summary

Using the maximum detected concentrations of total chlordane and dieldrin and dividing by their respective screening levels gives a risk of 1×10^{-5} excess cases of cancer. As is mentioned above, this number overstates the risk that would actually be posed to students, faculty and staff of the proposed Laurel School Upper Campus because of the much shorter exposure durations they would have compared to a residential receptor. Including all of the OCPs in the calculation increases the risk to 2×10^{-5} .

The maximum arsenic concentration detected at the Site was 9.4 mg/kg which on its own would produce an excess cancer risk of 1×10^{-5} . However, the background arsenic concentration in Menlo Park is taken as 12 mg/kg for this study – DTSC (2008) does not require establishing a background concentration for arsenic if all of the arsenic values detected in soil samples collected at a site are below 12 mg/kg. The background concentrations for arsenic identified in the studies in the San Francisco Bay area range from 4.4 to 31 mg/kg (LBNL 2009). A background concentration of 12 mg/kg was used by the DTSC for a Removal Action Objective for the former Town and Country Village site located at Stevens Creek and Winchester Boulevards in San Jose (IT 2009; Envirostor ID 43590001). In that study, IT Corporation concluded that naturally occurring background concentrations of arsenic in South Bay soils generally ranged from less than 1 mg/kg to about 20 mg/kg, with an overall average of about 12 mg/kg. Based on the observed distribution of arsenic concentrations in soil at the Site, and the results of the four studies, 12 mg/kg appears to be a reasonable value to adopt as the arsenic background concentration.

Characterizing the risk posed by the aggregate base is problematic as the cancer risk is driven by inhalation of asbestos fibers and the aggregate base is covered with asphalt. If the asphalt cover were to be disturbed, the base rock could conceivably produce a significant risk of cancer due to the inhalation of asbestos.

8.0 ECOLOGICAL SCREENING EVALUATION

8.1 Biological Characterization

The project site is proposed for development of a school. Proposed development activities would not maintain any potential wildlife habitat on the Site.

8.2 Ecological Pathway Assessment

Because the site would not have significant numbers of wildlife based on proposed development activities, no assessment of potential exposure to sensitive ecological receptors is necessary.

8.3 Ecological Screening Evaluation Summary

An ecological screening evaluation was not conducted for the site because the site is scheduled to be developed and highly disturbed, and will not support wildlife habitat.

9.0 COMMUNITY PROFILE

Terraphase obtained information on the community demographics for Menlo Park, California (www.city-data.com). As of 2012, Menlo Park (within zip code 94025 and 94026) had a population of 32,881 (52.9% female). The medium household income for Menlo Park, in 2012 was \$105,811 and the median home value was \$956,138. In addition, the population density was reportedly 3,247 people per square mile.

The District crosses into Atherton, California – two of the District’s schools are physically within the Atherton City Limits and some of the children who will attend the new Laurel School Upper Campus may live in Atherton. As of 2012, Atherton (within zip code 94025 and 94026) had a population of 7,191 (50% female). The medium household income for Atherton, in 2012 was \$212,407. The least expensive house for sale in Atherton currently is listed at \$2,998,000.

In accordance with Education Code § 17213.1, subd. (a)(6)(A) the District will post a notice in the local newspaper providing details on the 30-day public comment period for this PEA report, the public hearing, and the locations of repositories for Site documents. The DTSC will review the Draft PEA Report concurrently with the public comment period.

10.0 OPINION OF ENVIRONMENTAL PROFESSIONAL

The opinion of the environmental professional (Wendy Bellah, P.E. C75247) who conducted the Phase I ESA is provided in Section 8.0 of the Phase I ESA report which is appended to this report as Appendix A. The environmental professionals who prepared this PEA Report (Jeff Raines, P.E. C51120) and Alan Gibbs (P.G. 4827) concur in her opinions.

11.0 CONCLUSIONS AND RECOMMENDATIONS

11.1 Summary and Conclusions

Low levels of OCPs are present in the soil in the planters at the front of the existing school building. Naturally-occurring asbestos is present in the base rock below the asphalt surfaces at the Site and potentially below the existing school building.

11.2 Recommendations

11.2.1 Dieldrin in Planters

The dieldrin impacted soil should be removed and be disposed of under DTSC oversight and approval. Additional metals and total petroleum hydrocarbon testing will be required for waste disposal purposes. The cost of the analyses will be less than \$200.

One foot of soil will be excavated from the northwest planter (approximately 1.5 bank cubic yards) and 12.0 feet of soil will be excavated from the southeast planter (approximately 8.9 bank cubic yards). Based on the dieldrin and lead results, the soil is not a hazardous waste and can be disposed of in a municipal solid waste landfill (likely the Ox Mountain Landfill in Half Moon Bay, California). Upon reaching the planned excavation depth, two (2) soil samples will be collected from each excavation area for analysis for OCPs. Should any of the samples be found to contain OCPs at concentrations above the screening levels shown in Table 1, an additional six inches of soil will be excavated from that planter for off-site disposal. Two additional confirmation samples will be collected from the excavation for analysis for OCPs.

Upon obtaining confirmation sample results showing that the remaining soil meets the Site screening levels, the excavations will be backfilled with clean fill. The fill will be virgin road base from a quarry not-known to be in a geological formation impacted by naturally-occurring asbestos.

11.2.2 Radon

Radon testing should be conducted in the existing school building to assess if vapor barriers are needed for the new school. Zip code 94025 extends all the way to Interstate Highway 280 so most of the radon measurements that exceeded 4 picoCuries per liter were likely in the hills remote from the Site. However, radon testing is inexpensive and easy to mitigate for new structures, so radon testing is warranted.

11.2.3 Base Rock

There are approximately 3,000 tons of NOA-impacted base rock at the existing school – based on 1.9 acres of asphalt surface and six inches of base rock. If the base rock were to

be excavated and disposed of offsite, the cost would be approximately \$225,000 at \$75/ton for transport and disposal. As more than 3,000 tons of fill will be required to meet final grades, consolidating the base rock on Site saves another \$75,000 in imported fill costs. The total cost of \$300,000 to remove the base rock is excessive in comparison to the environmental benefit received.

The asbestos levels in the base rock are below concentrations that would require mitigation or specialized training/equipment to protect workers. No permit will be required from the Bay Area Air Quality Management District (BAAQMD) to perform the work. United States Occupational Safety and Health Administration (OSHA) regulations do require that workers be notified that they're dealing with material that contains asbestos. Normal precautions will be taken to control dust, i.e., water will be used to prevent visible emissions of dust. Perimeter and breathing zone dust monitoring, with laboratory analyses for asbestos, will be performed during grading activities to verify that workers and off-site receptors are not being exposed to unacceptable levels of asbestos fibers.

The base rock will be placed below a minimum of a one-foot cap of soil in the area of the proposed soccer field to be constructed at the Site. A geotextile separator will be placed between the base rock and the overlying soil. Construction workers will be notified that the base rock contains asbestos; air monitoring will be conducted (breathing zone of the workers and perimeter) to verify that human health screening levels for asbestos are not being exceeded. Future school staff will be notified annually that the base rock contains asbestos and the soil cap should not be disturbed.

A proposed Operations and Maintenance (O&M) Plan for maintaining the cap over the base rock is attached to this report in Appendix

11.3 Data Gaps

No significant data gaps remain.

11.4 Preliminary Scoping Recommendations

Further investigation is not required. As excavation and off-site disposal of the OCP-impacted soil and capping of the NOA-containing base rock are accepted remedial actions, a feasibility study is not required. Upon completion of mitigation of the OCP and NOA impacted soils, a PEA Addendum Report will be submitted to the DTSC for final approval.

12.0 REFERENCES


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13.0 SIGNATURES AND ENVIRONMENTAL PROFESSIONALS STATEMENT


Information, conclusions, and recommendations in this document have been prepared by a California Professional Geologist and a California Professional Engineer. The environmental assessment described herein was conducted by the undersigned employees of Terraphase. The assessment consisted solely of the activities described in the Introduction of this report, and was performed in accordance with the ASTM Designation E 1527-13 guidelines for Phase I Environmental Site Assessments and the Terms and Conditions of the Standard Consulting Services Agreement signed prior to initiation of the assessment, as applicable. The assessment was conducted in a manner consistent with the level of care and skill ordinarily exercised by professional engineers, professional geologists and environmental scientists.

We declare that, to the best of our professional knowledge and belief, we meet the definition of environmental professional as defined in §312.10 of 40 Code of Federal Regulations (CFR) 312, and we have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. We have developed and performed all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.



Alan Gibbs
Professional Geologist (4827)

22JAN15
Date



Jeff Raines
Professional Engineer (C51120)

22JAN15
Date

TABLES

Sample Location	Sample Identification	Sample Date	alpha-BHC	beta-BHC	gamma-BHC	delta-BHC	Heptachlor	Aldrin	Heptachlor epoxide	Endosulfan I	Dieldrin	4,4'-DDE	Endrin	Endosulfan II	Endosulfan sulfate	4,4'-DDD	Endrin aldehyde	4,4'-DDT	alpha-Chlordane	gamma-Chlordane	Methoxy-chlor	Toxaphene
S-1/S-2 Composite	S-1/S-2-0-0.5	4/14/2014	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	240	< 3.3	< 3.3	< 3.3	3.4	< 3.3 #	260	< 1.7	2.3 C	< 17	< 61
S-3/S-4 Composite	S-3/S-4-0-0.5	4/14/2014	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	61	< 9.8	< 9.8	< 9.8	< 9.8	< 9.8 #	16	< 5	< 5	< 50	< 180
S-5/S-6 Composite	S-5/S-6-0-0.5	4/14/2014	< 5.1	< 5.1	< 5.1	< 5.1	< 5.1	< 5.1	< 5.1	< 5.1	< 5.1	47	< 9.8	< 9.8	< 9.8	< 9.8	< 9.8 #	29	< 5.1	< 5.1	< 51	< 180
S-7/S-8 Composite	S-7/S-8-0-0.5	4/15/2014	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4	35	< 16	< 16	< 16	< 16	< 16 #	19 C	< 8.4	< 8.4	< 84	< 300
S-9/S-10 Composite	S-9/S-10-0-0.5	4/14/2014	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	3.2 #	88 C	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3 #	75	2.2	2.1	< 17	< 60
S-11/S-12 Composite	S-11/S-12-0-0.5	4/15/2014	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	33	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3 #	22	< 1.7	< 1.7	< 17	< 61
B-1/B-2 Composite	B-1/B-2-0-0.5	4/15/2014	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	60 C	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3 #	24	< 1.7	< 1.7	< 17	< 60
B-3/B-4 Composite	B-3/B-4-0-0.5	4/15/2014	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	34	< 9.8	< 9.8	< 9.8	< 9.8	< 9.8 #	27	8	5.9	< 50	< 180
B-5/B-6 Composite	B-5/B-6-0-0.5	4/14/2014	< 8.5	< 8.5	< 8.5	< 8.5	< 8.5	< 8.5	< 8.5	< 8.5	15 #C	28 C	< 16	< 16	< 16	< 16	< 16 #	24 C	< 8.5	< 8.5	< 85	< 300
B-7/B-8/B-9 Composite	B-7/B-8/B-9-0-0.5	4/15/2014	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	6.4	< 1.7	120	69 C	4.7	< 3.3	< 3.3	31 C	< 3.3 #	59	110	90	< 17	< 60
	B-7/B-8/B-9-2.5-3	4/15/2014	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	2.8 #	4.2	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3 #	< 3.3	< 1.7	< 1.7	< 17	< 60
B-7	B-7-0-0.5	4/15/2014	< 8.5	< 8.5	< 8.5	< 8.5	< 8.5	< 8.5	32 C	< 8.5	270	57 #	< 16	< 16	< 16	< 16	< 16	72	490 C	340	< 85	< 300
	B-7-1-1.5	6/7/2014	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	3.4	6.9	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	5.7 C	2.2 C	< 1.7	< 17	< 60
B-7 A	B-7A-0-0.5	6/7/2014	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	7.8	< 1.7	240	37	< 5.0 C	3.5 C	< 3.3	23	5.7 #	56	150	89	< 17	< 60
	B7A-1-1.5	6/7/2014	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	20	72	< 3.3	< 3.3	< 3.3	5.5	< 3.3	53	7.6 C	4.8	< 17	< 60
B-8	B-8-0-0.5	4/15/2014	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4	19	< 8.4	420	93 #	< 16	< 16	< 16	< 16	18	75	560 C	320	< 84	< 300
	B8-1-1.5	6/7/2014	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	55	84	< 3.3	< 3.3	< 3.3	7.1	< 3.3	65	37 C	< 1.7	< 17	< 60
B-8A	B8A-0-0.5	6/7/2014	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	7.4 C	< 1.7	100 C	62	< 3.3	6.2 C	< 3.3	26	7.3 #	110 C	120 C	66 C	< 17	< 60
	B-8A-1-1.5	6/7/2014	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	3.0	4.7	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	3.8	3.3 C	< 1.7	< 17	< 59
B-8B	B-8B-0-0.5	6/7/2014	< 1.7	< 1.7	< 1.7	< 1.7	7.5	3.7 C	15	< 1.7	300	46	7.5 C	5.9 C	< 3.3	45	12 C#	< 3.3	250	180	< 17	< 60
	B-8B-1-1.5	6/7/2014	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	10	90	9.2	< 3.3	< 3.3	6.9	< 3.3	56	7.1	5.1	< 17	< 60
B-8C	B-8C-0-0.5	6/7/2014	22	< 5.1	< 5.1	< 5.1	8.5	< 5.1	13	< 5.1	220	29	< 10	17 C	< 10	27	< 10	< 10	170 C	120	< 51	< 180
	B8C-1-1.5	6/7/2014	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	12	30	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	25	7.7 C	5.0	< 17	< 60
B-9	B9-0-0.5	6/7/2014	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	7.0	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	6.2	< 1.7	< 1.7	< 17	< 60
	B9-1-1.5	6/7/2014	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 1.7	< 1.7	< 17	< 61
B-13	B13-0-0.5	6/7/2014	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	5.5	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	4.8	< 1.7	< 1.7	< 17	< 61
	B13-1-1.5	6/7/2014	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 1.7	< 1.7	< 17	< 60
B-14	B14-0-0.5	6/7/2014	< 5.1	< 5.1	< 5.1	< 5.1	< 5.1	< 5.1	< 5.1	< 5.1	< 5.1	47	< 9.9	< 9.9	< 9.9	< 9.9	< 9.9	39	16	9.9	< 51	< 180
	B14-1-1.5	6/7/2014	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	60	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	21	< 1.7	< 1.7	< 17	< 60
B-15	B15-0-0.5	6/7/2014	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	5.3	< 1.7	2.6	18	< 3.3	6.0 C	< 3.3	27	4.9 C	33	220	190	< 17	< 59
	B15-1-1.5	6/7/2014	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	14	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	15	13	7.8	< 17	< 60
Screening Level																						
			110	390	630	390	130	33	76	370,000	33	1,600	18,000	370,000	370,000	2,300	18,000	1,600	430	430	340,000	460

Notes:

Screening levels are the lower of the CHHSI or RSL as modified by OEHHA Note 3

Screening value for Endrin was used for Endrin Aldehyde (similar compound)

Results are shown in micrograms per kilogram (ug/kg)

= CCV drift outside of limits; average CCV drift within limits per method requirements

C = presence confirmed, but RPD between columns exceeds 40%

< = sample not detected above laboratory detection limit

bold = sample detected above laboratory detection limit

= Result exceeded screening level

Table 2
 Polychlorinated Biphenyls and Metals Soil Sampling Results
 275 Elliott Drive
 Menlo Park, California

Sample Identification	Sample Date	Aroclor-1016 (ug/kg)	Aroclor-1221 (ug/kg)	Aroclor-1232 (ug/kg)	Aroclor-1242 (ug/kg)	Aroclor-1248 (ug/kg)	Aroclor-1254 (ug/kg)	Aroclor-1260 (ug/kg)	Arsenic (mg/kg)	Lead (mg/kg)
B-8-0-0.5	4/14/2014	<12	<24	<12	<12	<12	<12	<12	NA	47
S-1-0-0.5	4/14/2014	NA	NA	NA	NA	NA	NA	NA	9.4	NA
S-3-0-0.5	4/14/2014	NA	NA	NA	NA	NA	NA	NA	4	NA
S-5-0-0.5	4/14/2014	NA	NA	NA	NA	NA	NA	NA	4.1	NA
S-7-0-0.5	4/15/2014	NA	NA	NA	NA	NA	NA	NA	4.5	NA
S-10-0-1.5	4/14/2014	NA	NA	NA	NA	NA	NA	NA	6.8	NA
S-12-0-0.5	4/15/2014	NA	NA	NA	NA	NA	NA	NA	3.2	NA
B-1-0-0.5	4/15/2014	NA	NA	NA	NA	NA	NA	NA	NA	5.2
B-2-0-0.5	4/15/2014	NA	NA	NA	NA	NA	NA	NA	NA	3.3
B-3-0-0.5	4/15/2014	NA	NA	NA	NA	NA	NA	NA	NA	11
B-4-0-0.5	4/14/2014	NA	NA	NA	NA	NA	NA	NA	NA	17
B-5-0-0.5	4/14/2014	NA	NA	NA	NA	NA	NA	NA	NA	16
B-6-0-0.5	4/14/2014	NA	NA	NA	NA	NA	NA	NA	NA	23
B-7-0-0.5	4/14/2014	NA	NA	NA	NA	NA	NA	NA	NA	49
B-10-0-0.5	4/15/2014	NA	NA	NA	NA	NA	NA	NA	NA	13
B-11-0-0.5	4/15/2014	NA	NA	NA	NA	NA	NA	NA	NA	18
B-12-0-0.5	4/15/2014	NA	NA	NA	NA	NA	NA	NA	NA	12
Screening Level		390	140	140	220	220	110	220	12	80

Notes:

ug/kg = micrograms per kilogram

mg/kg = milligrams per kilogram

< = sample not detected above laboratory detection limit

bold = sample detected above laboratory detection limit

NA = not analyzed

Table 3
Naturally Occurring Asbestos Sampling Results
275 Elliott Drive
Menlo Park, California

Sample ID	Sample Date	PLM Result	TEM Result	TEM Greater than 0.001%wt
S-12 Base	4/15/2014	<0.25%	0.07885%	YES
S-8 Base	4/15/2014	<0.25%	<0.0001%	No
B-2 Base	4/15/2014	<0.25%	<0.0001%	No
S-7 Base	4/15/2014	<0.25%	0.0270%	YES
B-9 Base	4/15/2014	<0.25%	<0.0001%	No
B-3 Base	4/15/2014	<0.25%	0.00725%	YES
B-1 Base	4/15/2014	<0.25%	0.0548%	YES
S-11 Base	4/15/2014	<0.25%	0.0065%	YES

Notes:

PLM = Polarized light microscopy with CARB 435 prep

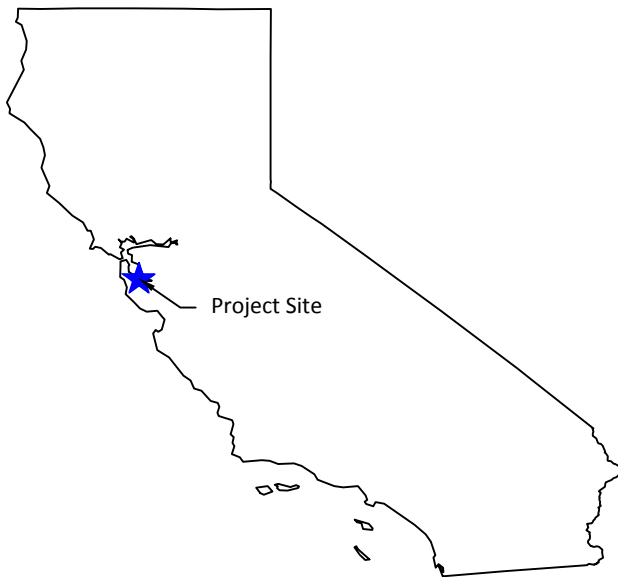
TEM = Transmission electron microscopy with CARB 435 prep

CARB = California Air Resources Board

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FIGURES

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SAFETY FIRST



CLIENT:

Menlo Park City School District

PROJECT:

275 Elliott Drive
Menlo Park, California

PROJECT NUMBER:

0084.001.001

Site Location Map

Figure 1

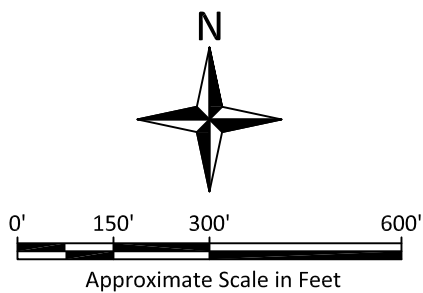
J:\CADD FILES\0084 Menlo Park City School District\Maps.dwg Drawn by: KW ; Checked by: WB




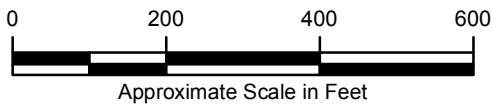
Source: Google Earth Pro. Imagery Date: 04-15-2013.

Legend


— Approximate Site Boundary



SAFETY FIRST	CLIENT: Menlo Park City School District	Site Features Map
	PROJECT: 275 Elliott Drive Menlo Park, California PROJECT NUMBER: 0084.001.001	



Legend

 Approximate Site Boundary

SAFETY FIRST



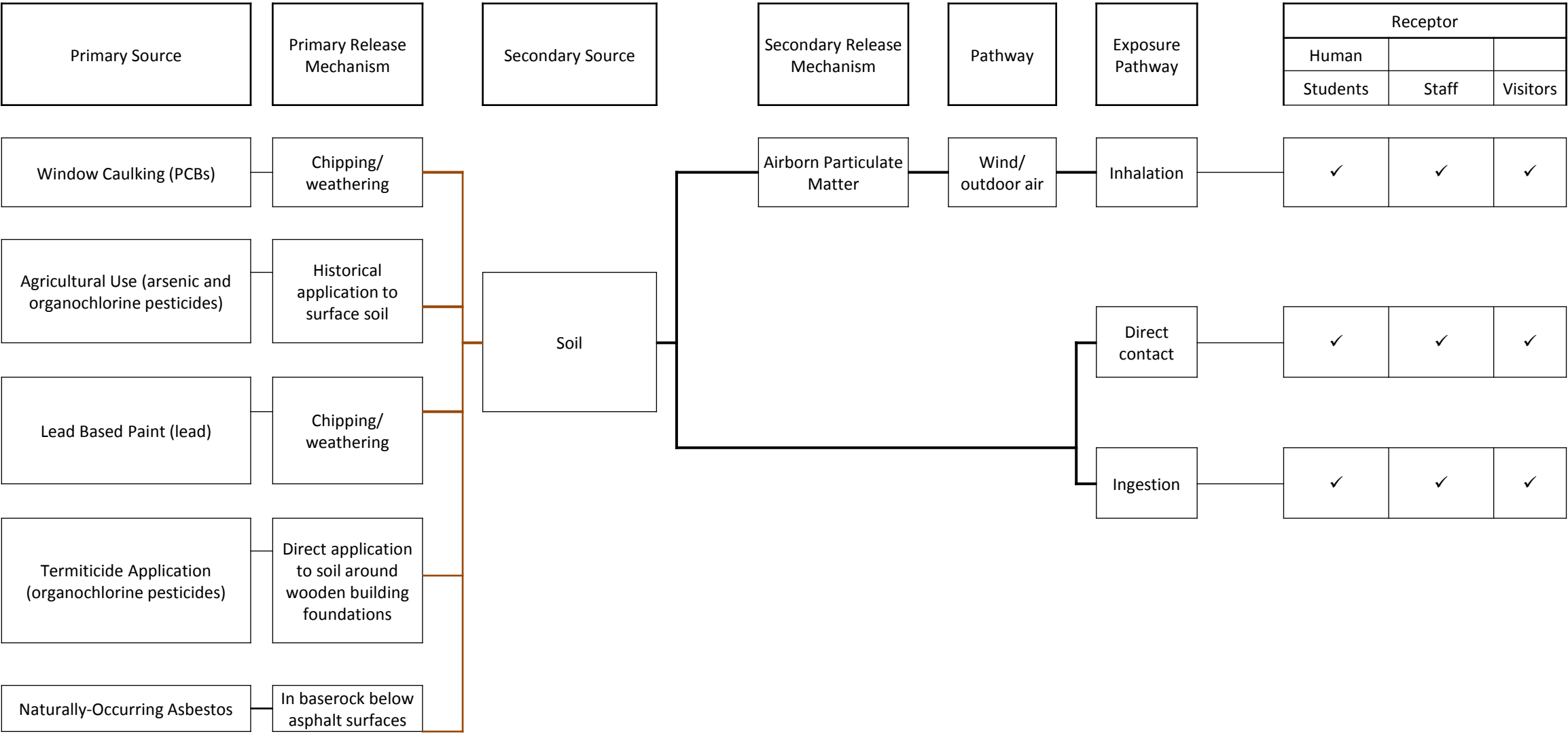
CLIENT: Menlo Park City School District


PROJECT: 275 Elliot Drive
Menlo Park, California

PROJECT NUMBER: 0084.001.001

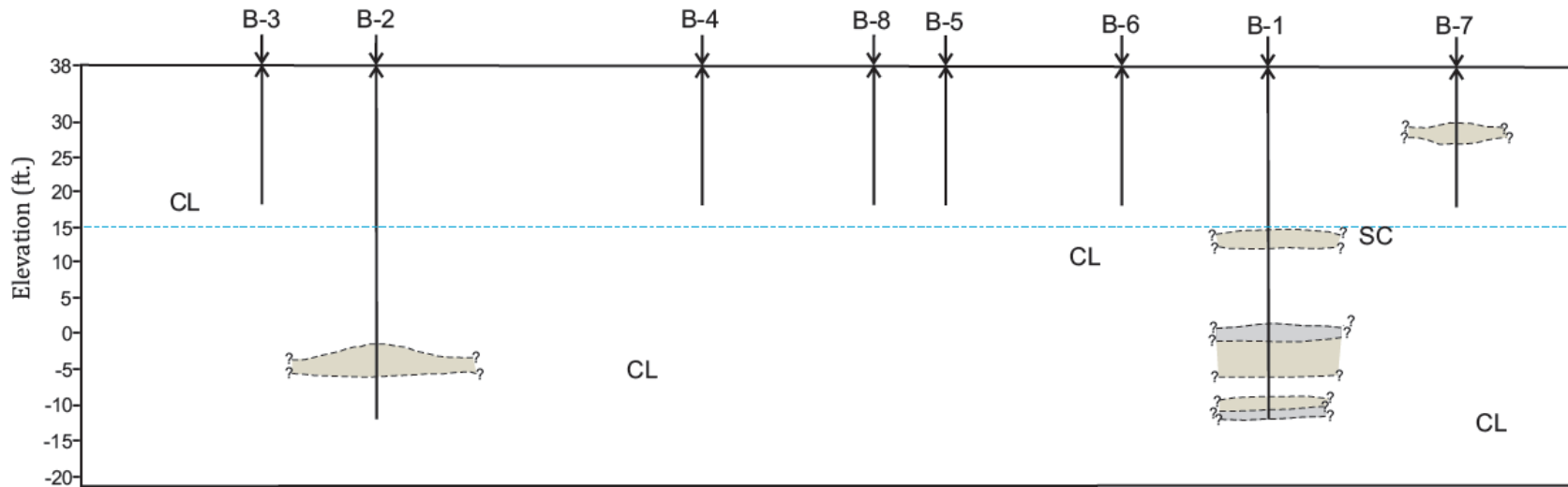
**Historic Site Features
1956**

FIGURE 3







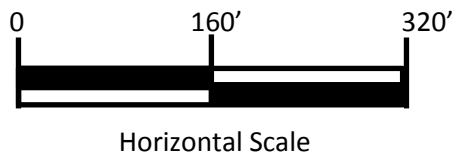
<div><div>SAFETY FIRST</div><div></div></div>	CLIENT: <div>Menlo Park City School District</div>	Conceptual Site Model
	PROJECT: <div>275 Elliott Drive Menlo Park, California</div>	
	PROJECT NUMBER: <div>0084.001.001</div>	FIGURE 4

NW ←→ SE




Legend

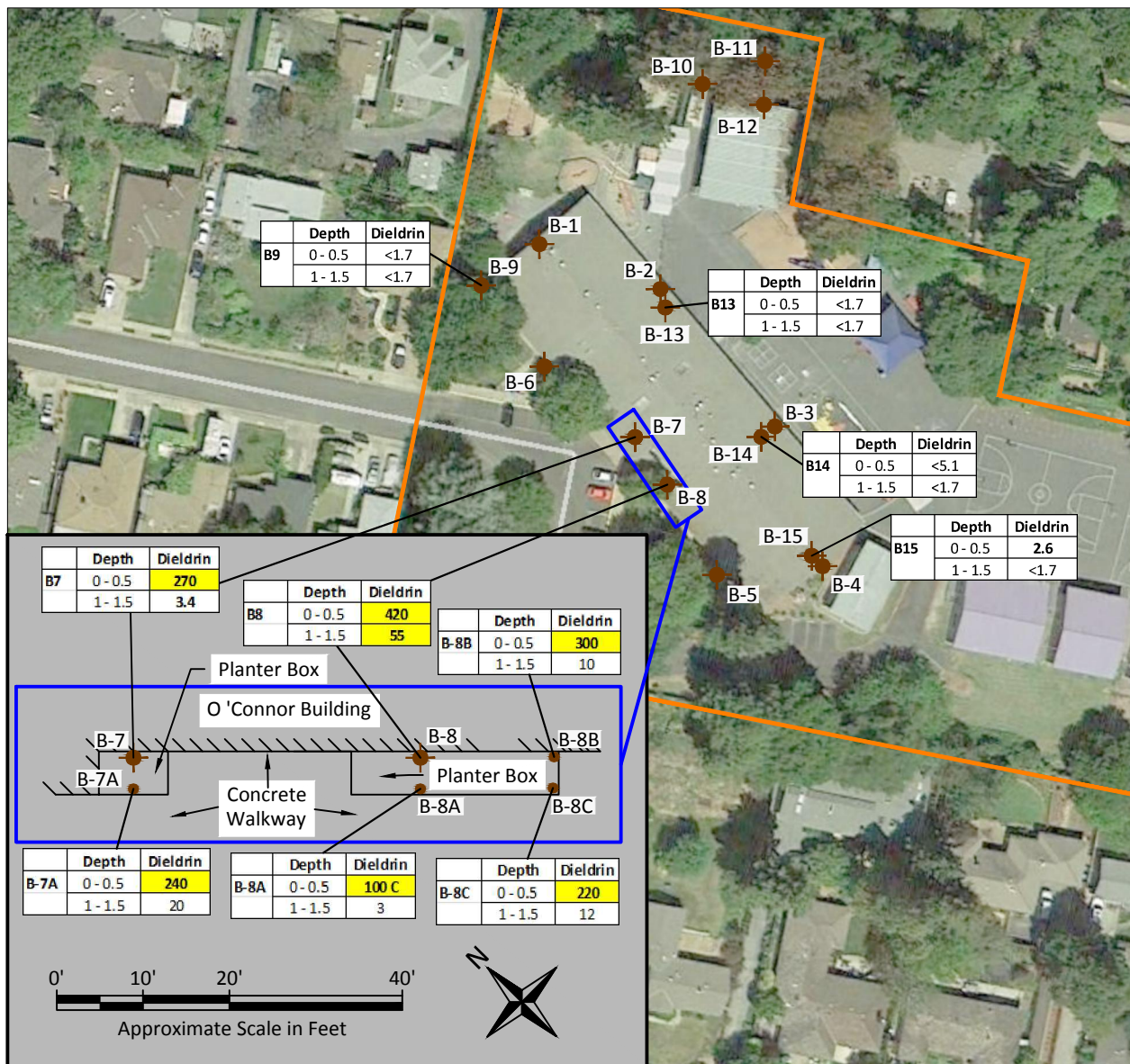
-  Sand lense
-  Gravel lense
-  Contact
-  Groundwater



Horizontal Scale

Source: BAGG 2014

SAFETY FIRST 	CLIENT: Menlo Park City School District	GEOLOGICAL SECTION
	PROJECT: 375 Elliott Drive Menolo Park Calikifornia	
	PROJECT NUMBER: 0084.001.001	Figure 5



Source: Google Earth Pro. Imagery Date: 04-15-2013.

Legend

- Approximate Site Boundary
- B-2 Soil Sampling Location
- B-8A Step-Out Soil Sampling Location

Notes

1. < = Sample not detected above laboratory detection
2. bgs = Below ground surface
3. C = Presence confirmed but RPD between columns exceeds 40%
4. Dieldrin results are shown in micrograms per kilogram (ug/kg)
5. **Highlighted cell** = Result exceeded screening level (33 ug/kg)
6. Sample depths shown in feet below ground surface

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CLIENT: Menlo Park City School District

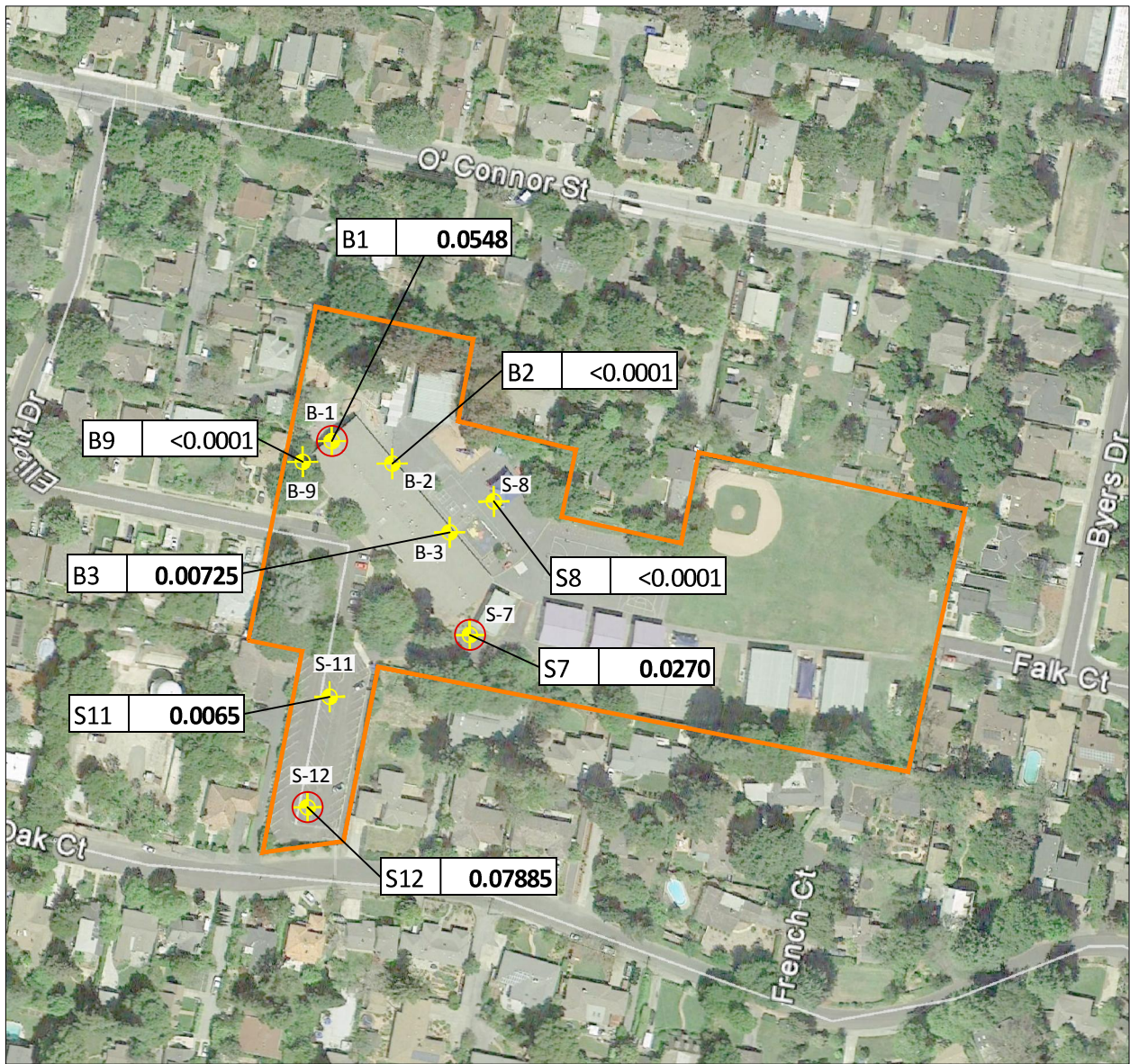
PROJECT: 275 Elliott Drive
Menlo Park, California

PROJECT NUMBER: 0084.001.001

**Soil Sampling Locations and
Discrete Sampling Results
for Dieldrin**

Figure 6

J:\CADD FILES\0084 Menlo Park City School District\Maps.dwg Drawn by: KW ; Checked by: WB



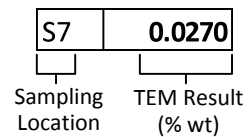
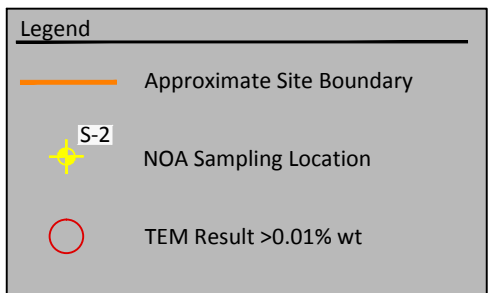
Source: Google Earth Pro. Imagery Date: 04-15-2013.

Acronyms and Abbreviations

NOA naturally occurring asbestos
TEM transmission electron microscopy



0' 100' 200' 400'
Approximate Scale in Feet



SAFETY FIRST



CLIENT: Menlo Park City School District
PROJECT: 275 Elliott Drive
Menlo Park, California
PROJECT NUMBER: 0084.001.001

NOA Sampling Locations and Results

Figure 7

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APPENDIX A

Phase I Environmental Site Assessment Report

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APPENDIX B

Analytical Results

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Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 257797
ANALYTICAL REPORT

Terraphase Engineering
1404 Franklin Street
Oakland, CA 94612

Project : 0084.001.001
Location : 275 Elliott Drive
Level : II

<u>Sample ID</u>	<u>Lab ID</u>
B7-1-1.5	257797-001
B7A-0-0.5	257797-002
B7A-1-1.5	257797-003
B8-1-1.5	257797-004
B8A-0-0.5	257797-005
B8A-1-1.5	257797-006
B8B-0-0.5	257797-007
B8B-1-1.5	257797-008
B8C-0-0.5	257797-009
B8C-1-1.5	257797-010
B9-0-0.5	257797-011
B9-1-1.5	257797-012
B13-0-0.5	257797-013
B13-1-1.5	257797-014
B14-0-0.5	257797-015
B14-1-1.5	257797-016
B15-0-0.5	257797-017
B15-1-1.5	257797-018

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: _____

Tracy Babjar
Project Manager
tracy.babjar@ctberk.com
(510) 204-2226

Date: 06/16/2014

CASE NARRATIVE

Laboratory number: 257797
Client: Terraphase Engineering
Project: 0084.001.001
Location: 275 Elliott Drive
Request Date: 06/09/14
Samples Received: 06/09/14

This data package contains sample and QC results for eighteen soil samples, requested for the above referenced project on 06/09/14. The samples were received cold and intact.

Pesticides (EPA 8081A):

All samples underwent sulfur cleanup using the copper option in EPA Method 3660B. All samples underwent florisil cleanup using EPA Method 3620C. B8C-0-0.5 (lab # 257797-009) and B14-0-0.5 (lab # 257797-015) were diluted due to the color of the sample extracts. No other analytical problems were encountered.

ct **Curtis & Tompkins Laboratories**
ENVIRONMENTAL ANALYTICAL TESTING LABORATORY
In Business Since 1878

Phone (510) 486-0900
Fax (510) 486-0532

Page 2 of 2
Chain of Custody # _____

Chris Jones

Wendy Bellah

Topic: Torsion Phase Engineering

:(510) 645-1850

by bellah3terraphase.com

[illegible]

RECEIVED BY:	
<i>Pat L...</i>	6/9/14
DATE:	TIME: 8:57 AM
DATE:	TIME:
DATE:	TIME:

COOLER RECEIPT CHECKLIST



Curtis & Tompkins, Ltd.

Login # 257797 Date Received 6/9/14 Number of coolers 1
 Client Terraphase Project 0284-001.001
 Date Opened 6/9/14 By (print) MT (sign) [Signature]
 Date Logged in 1 By (print) 1 (sign) 1

1. Did cooler come with a shipping slip (airbill, etc) _____ YES ☒ NO
 Shipping info _____

2A. Were custody seals present? ☐ YES (circle) on cooler on samples ☒ NO
 How many _____ Name _____ Date _____

2B. Were custody seals intact upon arrival? _____ YES NO N/A

3. Were custody papers dry and intact when received? _____ YES NO

4. Were custody papers filled out properly (ink, signed, etc)? _____ YES NO

5. Is the project identifiable from custody papers? (If so fill out top of form) _____ YES NO

6. Indicate the packing in cooler: (if other, describe) _____

☐ Bubble Wrap ☐ Foam blocks ☐ Bags ☒ None
☐ Cloth material ☐ Cardboard ☐ Styrofoam ☐ Paper towels

7. Temperature documentation: * Notify PM if temperature exceeds 6°C

Type of ice used: ☒ Wet ☐ Blue/Gel ☐ None Temp(°C) 55

☐ Samples received on ice & cold without a temperature blank; temp taken with IR gun

☐ Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? _____ YES ☒ NO

If YES, what time were they transferred to freezer? _____

9. Did all bottles arrive unbroken/unopened? _____ YES NO

10. Are there any missing / extra samples? _____ YES NO

11. Are samples in the appropriate containers for indicated tests? _____ YES NO

12. Are sample labels present, in good condition and complete? _____ YES NO

13. Do the sample labels agree with custody papers? _____ YES NO

14. Was sufficient amount of sample sent for tests requested? _____ YES NO

15. Are the samples appropriately preserved? _____ YES NO N/A

16. Did you check preservatives for all bottles for each sample? _____ YES NO N/A

17. Did you document your preservative check? _____ YES NO N/A

18. Did you change the hold time in LIMS for unpreserved VOAs? _____ YES NO N/A

19. Did you change the hold time in LIMS for preserved terracores? _____ YES NO N/A

20. Are bubbles > 6mm absent in VOA samples? _____ YES NO N/A

21. Was the client contacted concerning this sample delivery? _____ YES ☒ NO

If YES, Who was called? _____ By _____ Date: _____

COMMENTS

Detections Summary for 257797

Client : Terraphase Engineering
 Project : 0084.001.001
 Location : 275 Elliott Drive

Client Sample ID : B7-1-1.5

Laboratory Sample ID :

257797-001

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Dieldrin	3.4		1.7	0.40	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDE	6.9		3.3	0.59	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDT	5.7		3.3	0.47	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
alpha-Chlordane	2.2	C	1.7	0.21	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B

Client Sample ID : B7A-0-0.5

Laboratory Sample ID :

257797-002

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Heptachlor epoxide	7.8		1.7	0.22	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
Dieldrin	240		17	4.0	ug/Kg	As Recd	10.00	EPA 8081A	EPA 3550B
4,4'-DDE	37		3.3	0.58	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
Endrin	5.0	C	3.3	0.56	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
Endosulfan II	3.5	C	3.3	0.50	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDD	23		3.3	0.72	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
Endrin aldehyde	5.7	#	3.3	0.34	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDT	56		3.3	0.47	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
alpha-Chlordane	150		17	2.1	ug/Kg	As Recd	10.00	EPA 8081A	EPA 3550B
gamma-Chlordane	89		17	2.4	ug/Kg	As Recd	10.00	EPA 8081A	EPA 3550B

Client Sample ID : B7A-1-1.5

Laboratory Sample ID :

257797-003

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Dieldrin	20		1.7	0.40	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDE	72		3.3	0.59	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDD	5.5		3.3	0.73	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDT	53		3.3	0.48	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
alpha-Chlordane	7.6	C	1.7	0.21	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
gamma-Chlordane	4.8		1.7	0.25	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B

Client Sample ID : B8-1-1.5

Laboratory Sample ID :

257797-004

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Dieldrin	55		1.7	0.40	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDE	84		3.3	0.59	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDD	7.1		3.3	0.73	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDT	65		3.3	0.47	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
alpha-Chlordane	37	C	1.7	0.21	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B

Client Sample ID : B8A-0-0.5

Laboratory Sample ID :

257797-005

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Heptachlor epoxide	7.4	C	1.7	0.20	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
Dieldrin	100	C	1.7	0.40	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDE	62		3.3	0.59	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
Endosulfan II	6.2	C	3.3	0.50	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDD	26		3.3	0.73	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
Endrin aldehyde	7.3	#	3.3	0.34	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDT	110	C	3.3	0.48	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
alpha-Chlordane	120	C	17	2.1	ug/Kg	As Recd	10.00	EPA 8081A	EPA 3550B
gamma-Chlordane	66	C	1.7	0.25	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B

Client Sample ID : B8A-1-1.5

Laboratory Sample ID :

257797-006

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Dieldrin	3.0		1.7	0.39	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDE	4.7		3.3	0.30	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDT	3.8		3.3	0.70	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
alpha-Chlordane	3.3	C	1.7	0.20	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B

Client Sample ID : B8B-0-0.5

Laboratory Sample ID :

257797-007

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Heptachlor	7.5		1.7	0.19	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
Aldrin	3.7	C	1.7	0.18	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
Heptachlor epoxide	15		1.7	0.22	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
Dieldrin	300		17	3.1	ug/Kg	As Recd	10.00	EPA 8081A	EPA 3550B
4,4'-DDE	46		3.3	0.58	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
Endrin	7.5	C	3.3	0.56	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
Endosulfan II	5.9	C	3.3	0.50	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDD	45		3.3	0.72	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
Endrin aldehyde	12	#,C	3.3	0.33	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
alpha-Chlordane	250		17	2.0	ug/Kg	As Recd	10.00	EPA 8081A	EPA 3550B
gamma-Chlordane	180		17	2.4	ug/Kg	As Recd	10.00	EPA 8081A	EPA 3550B

Client Sample ID : B8B-1-1.5

Laboratory Sample ID :

257797-008

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Dieldrin	10		1.7	0.40	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDE	90		3.3	0.59	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
Endrin	9.2		3.3	0.56	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDD	6.9		3.3	0.73	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDT	56		3.3	0.47	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
alpha-Chlordane	7.1		1.7	0.21	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
gamma-Chlordane	5.1		1.7	0.15	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B

Client Sample ID : B8C-0-0.5

Laboratory Sample ID :

257797-009

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
alpha-BHC	22		5.1	0.60	ug/Kg	As Recd	3.000	EPA 8081A	EPA 3550B
Heptachlor	8.5		5.1	0.58	ug/Kg	As Recd	3.000	EPA 8081A	EPA 3550B
Heptachlor epoxide	13		5.1	0.59	ug/Kg	As Recd	3.000	EPA 8081A	EPA 3550B
Dieldrin	220		5.1	1.2	ug/Kg	As Recd	3.000	EPA 8081A	EPA 3550B
4,4'-DDE	29		10	1.8	ug/Kg	As Recd	3.000	EPA 8081A	EPA 3550B
Endosulfan II	17	C	10	1.5	ug/Kg	As Recd	3.000	EPA 8081A	EPA 3550B
4,4'-DDD	27		10	2.2	ug/Kg	As Recd	3.000	EPA 8081A	EPA 3550B
alpha-Chlordane	170	C	5.1	0.62	ug/Kg	As Recd	3.000	EPA 8081A	EPA 3550B
gamma-Chlordane	120		5.1	0.74	ug/Kg	As Recd	3.000	EPA 8081A	EPA 3550B

Client Sample ID : B8C-1-1.5

Laboratory Sample ID :

257797-010

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Dieldrin	12		1.7	0.40	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDE	30		3.3	0.59	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDT	25		3.3	0.48	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
alpha-Chlordane	7.7	C	1.7	0.21	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
gamma-Chlordane	5.0		1.7	0.25	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B

Client Sample ID : B9-0-0.5

Laboratory Sample ID :

257797-011

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
4,4'-DDE	7.0		3.3	0.58	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDT	6.2		3.3	0.47	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B

Client Sample ID : B9-1-1.5

Laboratory Sample ID :

257797-012

No Detections

Client Sample ID : B13-0-0.5

Laboratory Sample ID :

257797-013

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
4,4'-DDE	5.5		3.3	0.59	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDT	4.8		3.3	0.48	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B

Client Sample ID : B13-1-1.5

Laboratory Sample ID :

257797-014

No Detections

Client Sample ID : B14-0-0.5

Laboratory Sample ID :

257797-015

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
4,4'-DDE	47		9.9	1.8	ug/Kg	As Recd	3.000	EPA 8081A	EPA 3550B
4,4'-DDT	39		9.9	1.4	ug/Kg	As Recd	3.000	EPA 8081A	EPA 3550B
alpha-Chlordane	16		5.1	0.62	ug/Kg	As Recd	3.000	EPA 8081A	EPA 3550B
gamma-Chlordane	9.9		5.1	0.73	ug/Kg	As Recd	3.000	EPA 8081A	EPA 3550B

Client Sample ID : B14-1-1.5

Laboratory Sample ID :

257797-016

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
4,4'-DDE	60		3.3	0.31	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDT	21		3.3	0.48	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B

Client Sample ID : B15-0-0.5

Laboratory Sample ID :

257797-017

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Heptachlor epoxide	5.3		1.7	0.22	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
Dieldrin	2.6		1.7	0.39	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDE	18		3.3	0.58	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
Endosulfan II	6.0	C	3.3	0.49	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDD	27		3.3	0.72	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
Endrin aldehyde	4.9	C	3.3	0.33	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDT	33		3.3	0.47	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
alpha-Chlordane	220		17	2.1	ug/Kg	As Recd	10.00	EPA 8081A	EPA 3550B
gamma-Chlordane	190		17	1.5	ug/Kg	As Recd	10.00	EPA 8081A	EPA 3550B

Client Sample ID : B15-1-1.5

Laboratory Sample ID :

257797-018

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
4,4'-DDE	14		3.3	0.59	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDT	15		3.3	0.48	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
alpha-Chlordane	13		1.7	0.21	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
gamma-Chlordane	7.8		1.7	0.25	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B

= CCV drift outside limits; average CCV drift within limits per method requirements

C = Presence confirmed, but RPD between columns exceeds 40%

Organochlorine Pesticides

Lab #:	257797	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	B7-1-1.5	Batch#:	212049
Lab ID:	257797-001	Sampled:	06/07/14
Matrix:	Soil	Received:	06/09/14
Units:	ug/Kg	Prepared:	06/10/14
Basis:	as received	Analyzed:	06/11/14
Diln Fac:	1.000		

Analyte	Result	RL
alpha-BHC	ND	1.7
beta-BHC	ND	1.7
gamma-BHC	ND	1.7
delta-BHC	ND	1.7
Heptachlor	ND	1.7
Aldrin	ND	1.7
Heptachlor epoxide	ND	1.7
Endosulfan I	ND	1.7
Dieldrin	3.4	1.7
4,4'-DDE	6.9	3.3
Endrin	ND	3.3
Endosulfan II	ND	3.3
Endosulfan sulfate	ND	3.3
4,4'-DDD	ND	3.3
Endrin aldehyde	ND	3.3
4,4'-DDT	5.7	3.3
alpha-Chlordane	2.2 C	1.7
gamma-Chlordane	ND	1.7
Methoxychlor	ND	17
Toxaphene	ND	60

Surrogate	%REC	Limits
TCMX	64	42-134
Decachlorobiphenyl	51	29-122

C= Presence confirmed, but RPD between columns exceeds 40%

ND= Not Detected

RL= Reporting Limit

Organochlorine Pesticides

Lab #:	257797	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	B7A-0-0.5	Batch#:	212049
Lab ID:	257797-002	Sampled:	06/07/14
Matrix:	Soil	Received:	06/09/14
Units:	ug/Kg	Prepared:	06/10/14
Basis:	as received	Analyzed:	06/11/14

Analyte	Result	RL	Diln Fac
alpha-BHC	ND	1.7	1.000
beta-BHC	ND	1.7	1.000
gamma-BHC	ND	1.7	1.000
delta-BHC	ND	1.7	1.000
Heptachlor	ND	1.7	1.000
Aldrin	ND	1.7	1.000
Heptachlor epoxide	7.8	1.7	1.000
Endosulfan I	ND	1.7	1.000
Dieldrin	240	17	10.00
4,4'-DDE	37	3.3	1.000
Endrin	5.0 C	3.3	1.000
Endosulfan II	3.5 C	3.3	1.000
Endosulfan sulfate	ND	3.3	1.000
4,4'-DDD	23	3.3	1.000
Endrin aldehyde	5.7 #	3.3	1.000
4,4'-DDT	56	3.3	1.000
alpha-Chlordane	150	17	10.00
gamma-Chlordane	89	17	10.00
Methoxychlor	ND	17	1.000
Toxaphene	ND	60	1.000

Surrogate	%REC	Limits	Diln Fac
TCMX	71	42-134	1.000
Decachlorobiphenyl	43	29-122	1.000

#= CCV drift outside limits; average CCV drift within limits per method requirements

C= Presence confirmed, but RPD between columns exceeds 40%

ND= Not Detected

RL= Reporting Limit

Organochlorine Pesticides

Lab #:	257797	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	B7A-1-1.5	Batch#:	212049
Lab ID:	257797-003	Sampled:	06/07/14
Matrix:	Soil	Received:	06/09/14
Units:	ug/Kg	Prepared:	06/10/14
Basis:	as received	Analyzed:	06/11/14
Diln Fac:	1.000		

Analyte	Result	RL
alpha-BHC	ND	1.7
beta-BHC	ND	1.7
gamma-BHC	ND	1.7
delta-BHC	ND	1.7
Heptachlor	ND	1.7
Aldrin	ND	1.7
Heptachlor epoxide	ND	1.7
Endosulfan I	ND	1.7
Dieldrin	20	1.7
4,4'-DDE	72	3.3
Endrin	ND	3.3
Endosulfan II	ND	3.3
Endosulfan sulfate	ND	3.3
4,4'-DDD	5.5	3.3
Endrin aldehyde	ND	3.3
4,4'-DDT	53	3.3
alpha-Chlordane	7.6 C	1.7
gamma-Chlordane	4.8	1.7
Methoxychlor	ND	17
Toxaphene	ND	60

Surrogate	%REC	Limits
TCMX	78	42-134
Decachlorobiphenyl	51	29-122

C= Presence confirmed, but RPD between columns exceeds 40%
ND= Not Detected
RL= Reporting Limit

Organochlorine Pesticides

Lab #:	257797	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	B8-1-1.5	Batch#:	212049
Lab ID:	257797-004	Sampled:	06/07/14
Matrix:	Soil	Received:	06/09/14
Units:	ug/Kg	Prepared:	06/10/14
Basis:	as received	Analyzed:	06/11/14
Diln Fac:	1.000		

Analyte	Result	RL
alpha-BHC	ND	1.7
beta-BHC	ND	1.7
gamma-BHC	ND	1.7
delta-BHC	ND	1.7
Heptachlor	ND	1.7
Aldrin	ND	1.7
Heptachlor epoxide	ND	1.7
Endosulfan I	ND	1.7
Dieldrin	55	1.7
4,4'-DDE	84	3.3
Endrin	ND	3.3
Endosulfan II	ND	3.3
Endosulfan sulfate	ND	3.3
4,4'-DDD	7.1	3.3
Endrin aldehyde	ND	3.3
4,4'-DDT	65	3.3
alpha-Chlordane	37 C	1.7
gamma-Chlordane	ND	1.7
Methoxychlor	ND	17
Toxaphene	ND	60

Surrogate	%REC	Limits
TCMX	87	42-134
Decachlorobiphenyl	57	29-122

C= Presence confirmed, but RPD between columns exceeds 40%
ND= Not Detected
RL= Reporting Limit

Organochlorine Pesticides

Lab #:	257797	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	B8A-0-0.5	Batch#:	212049
Lab ID:	257797-005	Sampled:	06/07/14
Matrix:	Soil	Received:	06/09/14
Units:	ug/Kg	Prepared:	06/10/14
Basis:	as received	Analyzed:	06/11/14

Analyte	Result	RL	Diln Fac
alpha-BHC	ND	1.7	1.000
beta-BHC	ND	1.7	1.000
gamma-BHC	ND	1.7	1.000
delta-BHC	ND	1.7	1.000
Heptachlor	ND	1.7	1.000
Aldrin	ND	1.7	1.000
Heptachlor epoxide	7.4 C	1.7	1.000
Endosulfan I	ND	1.7	1.000
Dieldrin	100 C	1.7	1.000
4,4'-DDE	62	3.3	1.000
Endrin	ND	3.3	1.000
Endosulfan II	6.2 C	3.3	1.000
Endosulfan sulfate	ND	3.3	1.000
4,4'-DDD	26	3.3	1.000
Endrin aldehyde	7.3 #	3.3	1.000
4,4'-DDT	110 C	3.3	1.000
alpha-Chlordane	120 C	17	10.00
gamma-Chlordane	66 C	1.7	1.000
Methoxychlor	ND	17	1.000
Toxaphene	ND	60	1.000

Surrogate	%REC	Limits	Diln Fac
TCMX	78	42-134	1.000
Decachlorobiphenyl	39	29-122	1.000

#= CCV drift outside limits; average CCV drift within limits per method requirements

C= Presence confirmed, but RPD between columns exceeds 40%

ND= Not Detected

RL= Reporting Limit

Organochlorine Pesticides			
Lab #:	257797	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	B8A-1-1.5	Batch#:	212049
Lab ID:	257797-006	Sampled:	06/07/14
Matrix:	Soil	Received:	06/09/14
Units:	ug/Kg	Prepared:	06/10/14
Basis:	as received	Analyzed:	06/11/14
Diln Fac:	1.000		

Analyte	Result	RL
alpha-BHC	ND	1.7
beta-BHC	ND	1.7
gamma-BHC	ND	1.7
delta-BHC	ND	1.7
Heptachlor	ND	1.7
Aldrin	ND	1.7
Heptachlor epoxide	ND	1.7
Endosulfan I	ND	1.7
Dieldrin	3.0	1.7
4,4'-DDE	4.7	3.3
Endrin	ND	3.3
Endosulfan II	ND	3.3
Endosulfan sulfate	ND	3.3
4,4'-DDD	ND	3.3
Endrin aldehyde	ND	3.3
4,4'-DDT	3.8	3.3
alpha-Chlordane	3.3 C	1.7
gamma-Chlordane	ND	1.7
Methoxychlor	ND	17
Toxaphene	ND	59

Surrogate	%REC	Limits
TCMX	109	42-134
Decachlorobiphenyl	76	29-122

C= Presence confirmed, but RPD between columns exceeds 40%

ND= Not Detected

RL= Reporting Limit

Organochlorine Pesticides

Lab #:	257797	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	B8B-0-0.5	Batch#:	212049
Lab ID:	257797-007	Sampled:	06/07/14
Matrix:	Soil	Received:	06/09/14
Units:	ug/Kg	Prepared:	06/10/14
Basis:	as received	Analyzed:	06/11/14

Analyte	Result	RL	Diln Fac
alpha-BHC	ND	1.7	1.000
beta-BHC	ND	1.7	1.000
gamma-BHC	ND	1.7	1.000
delta-BHC	ND	1.7	1.000
Heptachlor	7.5	1.7	1.000
Aldrin	3.7 C	1.7	1.000
Heptachlor epoxide	15	1.7	1.000
Endosulfan I	ND	1.7	1.000
Dieldrin	300	17	10.00
4,4'-DDE	46	3.3	1.000
Endrin	7.5 C	3.3	1.000
Endosulfan II	5.9 C	3.3	1.000
Endosulfan sulfate	ND	3.3	1.000
4,4'-DDD	45	3.3	1.000
Endrin aldehyde	12 C #	3.3	1.000
4,4'-DDT	ND	3.3	1.000
alpha-Chlordane	250	17	10.00
gamma-Chlordane	180	17	10.00
Methoxychlor	ND	17	1.000
Toxaphene	ND	60	1.000

Surrogate	%REC	Limits	Diln Fac
TCMX	73	42-134	1.000
Decachlorobiphenyl	42	29-122	1.000

#= CCV drift outside limits; average CCV drift within limits per method requirements

C= Presence confirmed, but RPD between columns exceeds 40%

ND= Not Detected

RL= Reporting Limit

Organochlorine Pesticides

Lab #:	257797	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	B8B-1-1.5	Batch#:	212049
Lab ID:	257797-008	Sampled:	06/07/14
Matrix:	Soil	Received:	06/09/14
Units:	ug/Kg	Prepared:	06/10/14
Basis:	as received	Analyzed:	06/11/14
Diln Fac:	1.000		

Analyte	Result	RL
alpha-BHC	ND	1.7
beta-BHC	ND	1.7
gamma-BHC	ND	1.7
delta-BHC	ND	1.7
Heptachlor	ND	1.7
Aldrin	ND	1.7
Heptachlor epoxide	ND	1.7
Endosulfan I	ND	1.7
Dieldrin	10	1.7
4,4'-DDE	90	3.3
Endrin	9.2	3.3
Endosulfan II	ND	3.3
Endosulfan sulfate	ND	3.3
4,4'-DDD	6.9	3.3
Endrin aldehyde	ND	3.3
4,4'-DDT	56	3.3
alpha-Chlordane	7.1	1.7
gamma-Chlordane	5.1	1.7
Methoxychlor	ND	17
Toxaphene	ND	60

Surrogate	%REC	Limits
TCMX	78	42-134
Decachlorobiphenyl	57	29-122

ND= Not Detected
 RL= Reporting Limit

Organochlorine Pesticides

Lab #:	257797	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	B8C-0-0.5	Batch#:	212049
Lab ID:	257797-009	Sampled:	06/07/14
Matrix:	Soil	Received:	06/09/14
Units:	ug/Kg	Prepared:	06/10/14
Basis:	as received	Analyzed:	06/11/14
Diln Fac:	3.000		

Analyte	Result	RL
alpha-BHC	22	5.1
beta-BHC	ND	5.1
gamma-BHC	ND	5.1
delta-BHC	ND	5.1
Heptachlor	8.5	5.1
Aldrin	ND	5.1
Heptachlor epoxide	13	5.1
Endosulfan I	ND	5.1
Dieldrin	220	5.1
4,4'-DDE	29	10
Endrin	ND	10
Endosulfan II	17 C	10
Endosulfan sulfate	ND	10
4,4'-DDD	27	10
Endrin aldehyde	ND	10
4,4'-DDT	ND	10
alpha-Chlordane	170 C	5.1
gamma-Chlordane	120	5.1
Methoxychlor	ND	51
Toxaphene	ND	180

Surrogate	%REC	Limits
TCMX	78	42-134
Decachlorobiphenyl	41	29-122

C= Presence confirmed, but RPD between columns exceeds 40%
ND= Not Detected
RL= Reporting Limit

Organochlorine Pesticides

Lab #:	257797	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	B8C-1-1.5	Batch#:	212049
Lab ID:	257797-010	Sampled:	06/07/14
Matrix:	Soil	Received:	06/09/14
Units:	ug/Kg	Prepared:	06/10/14
Basis:	as received	Analyzed:	06/11/14
Diln Fac:	1.000		

Analyte	Result	RL
alpha-BHC	ND	1.7
beta-BHC	ND	1.7
gamma-BHC	ND	1.7
delta-BHC	ND	1.7
Heptachlor	ND	1.7
Aldrin	ND	1.7
Heptachlor epoxide	ND	1.7
Endosulfan I	ND	1.7
Dieldrin	12	1.7
4,4'-DDE	30	3.3
Endrin	ND	3.3
Endosulfan II	ND	3.3
Endosulfan sulfate	ND	3.3
4,4'-DDD	ND	3.3
Endrin aldehyde	ND	3.3
4,4'-DDT	25	3.3
alpha-Chlordane	7.7 C	1.7
gamma-Chlordane	5.0	1.7
Methoxychlor	ND	17
Toxaphene	ND	60

Surrogate	%REC	Limits
TCMX	85	42-134
Decachlorobiphenyl	58	29-122

C= Presence confirmed, but RPD between columns exceeds 40%
ND= Not Detected
RL= Reporting Limit

Organochlorine Pesticides

Lab #:	257797	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	B9-0-0.5	Batch#:	212049
Lab ID:	257797-011	Sampled:	06/07/14
Matrix:	Soil	Received:	06/09/14
Units:	ug/Kg	Prepared:	06/10/14
Basis:	as received	Analyzed:	06/11/14
Diln Fac:	1.000		

Analyte	Result	RL
alpha-BHC	ND	1.7
beta-BHC	ND	1.7
gamma-BHC	ND	1.7
delta-BHC	ND	1.7
Heptachlor	ND	1.7
Aldrin	ND	1.7
Heptachlor epoxide	ND	1.7
Endosulfan I	ND	1.7
Dieldrin	ND	1.7
4,4'-DDE	7.0	3.3
Endrin	ND	3.3
Endosulfan II	ND	3.3
Endosulfan sulfate	ND	3.3
4,4'-DDD	ND	3.3
Endrin aldehyde	ND	3.3
4,4'-DDT	6.2	3.3
alpha-Chlordane	ND	1.7
gamma-Chlordane	ND	1.7
Methoxychlor	ND	17
Toxaphene	ND	60

Surrogate	%REC	Limits
TCMX	89	42-134
Decachlorobiphenyl	55	29-122

ND= Not Detected
RL= Reporting Limit

Organochlorine Pesticides			
Lab #:	257797	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	B9-1-1.5	Batch#:	212049
Lab ID:	257797-012	Sampled:	06/07/14
Matrix:	Soil	Received:	06/09/14
Units:	ug/Kg	Prepared:	06/10/14
Basis:	as received	Analyzed:	06/11/14
Diln Fac:	1.000		

Analyte	Result	RL
alpha-BHC	ND	1.7
beta-BHC	ND	1.7
gamma-BHC	ND	1.7
delta-BHC	ND	1.7
Heptachlor	ND	1.7
Aldrin	ND	1.7
Heptachlor epoxide	ND	1.7
Endosulfan I	ND	1.7
Dieldrin	ND	1.7
4,4'-DDE	ND	3.3
Endrin	ND	3.3
Endosulfan II	ND	3.3
Endosulfan sulfate	ND	3.3
4,4'-DDD	ND	3.3
Endrin aldehyde	ND	3.3
4,4'-DDT	ND	3.3
alpha-Chlordane	ND	1.7
gamma-Chlordane	ND	1.7
Methoxychlor	ND	17
Toxaphene	ND	61

Surrogate	%REC	Limits
TCMX	86	42-134
Decachlorobiphenyl	61	29-122

ND= Not Detected
RL= Reporting Limit

Organochlorine Pesticides			
Lab #:	257797	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	B13-0-0.5	Batch#:	212049
Lab ID:	257797-013	Sampled:	06/07/14
Matrix:	Soil	Received:	06/09/14
Units:	ug/Kg	Prepared:	06/10/14
Basis:	as received	Analyzed:	06/11/14
Diln Fac:	1.000		

Analyte	Result	RL
alpha-BHC	ND	1.7
beta-BHC	ND	1.7
gamma-BHC	ND	1.7
delta-BHC	ND	1.7
Heptachlor	ND	1.7
Aldrin	ND	1.7
Heptachlor epoxide	ND	1.7
Endosulfan I	ND	1.7
Dieldrin	ND	1.7
4,4'-DDE	5.5	3.3
Endrin	ND	3.3
Endosulfan II	ND	3.3
Endosulfan sulfate	ND	3.3
4,4'-DDD	ND	3.3
Endrin aldehyde	ND	3.3
4,4'-DDT	4.8	3.3
alpha-Chlordane	ND	1.7
gamma-Chlordane	ND	1.7
Methoxychlor	ND	17
Toxaphene	ND	61

Surrogate	%REC	Limits
TCMX	81	42-134
Decachlorobiphenyl	59	29-122

ND= Not Detected
RL= Reporting Limit

Organochlorine Pesticides

Lab #:	257797	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	B13-1-1.5	Batch#:	212049
Lab ID:	257797-014	Sampled:	06/07/14
Matrix:	Soil	Received:	06/09/14
Units:	ug/Kg	Prepared:	06/10/14
Basis:	as received	Analyzed:	06/11/14
Diln Fac:	1.000		

Analyte	Result	RL
alpha-BHC	ND	1.7
beta-BHC	ND	1.7
gamma-BHC	ND	1.7
delta-BHC	ND	1.7
Heptachlor	ND	1.7
Aldrin	ND	1.7
Heptachlor epoxide	ND	1.7
Endosulfan I	ND	1.7
Dieldrin	ND	1.7
4,4'-DDE	ND	3.3
Endrin	ND	3.3
Endosulfan II	ND	3.3
Endosulfan sulfate	ND	3.3
4,4'-DDD	ND	3.3
Endrin aldehyde	ND	3.3
4,4'-DDT	ND	3.3
alpha-Chlordane	ND	1.7
gamma-Chlordane	ND	1.7
Methoxychlor	ND	17
Toxaphene	ND	60

Surrogate	%REC	Limits
TCMX	86	42-134
Decachlorobiphenyl	57	29-122

ND= Not Detected
RL= Reporting Limit

Organochlorine Pesticides

Lab #:	257797	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	B14-0-0.5	Batch#:	212049
Lab ID:	257797-015	Sampled:	06/07/14
Matrix:	Soil	Received:	06/09/14
Units:	ug/Kg	Prepared:	06/10/14
Basis:	as received	Analyzed:	06/11/14
Diln Fac:	3.000		

Analyte	Result	RL
alpha-BHC	ND	5.1
beta-BHC	ND	5.1
gamma-BHC	ND	5.1
delta-BHC	ND	5.1
Heptachlor	ND	5.1
Aldrin	ND	5.1
Heptachlor epoxide	ND	5.1
Endosulfan I	ND	5.1
Dieldrin	ND	5.1
4,4'-DDE	47	9.9
Endrin	ND	9.9
Endosulfan II	ND	9.9
Endosulfan sulfate	ND	9.9
4,4'-DDD	ND	9.9
Endrin aldehyde	ND	9.9
4,4'-DDT	39	9.9
alpha-Chlordane	16	5.1
gamma-Chlordane	9.9	5.1
Methoxychlor	ND	51
Toxaphene	ND	180

Surrogate	%REC	Limits
TCMX	63	42-134
Decachlorobiphenyl	77	29-122

ND= Not Detected
 RL= Reporting Limit

Organochlorine Pesticides

Lab #:	257797	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	B14-1-1.5	Batch#:	212049
Lab ID:	257797-016	Sampled:	06/07/14
Matrix:	Soil	Received:	06/09/14
Units:	ug/Kg	Prepared:	06/10/14
Basis:	as received	Analyzed:	06/12/14
Diln Fac:	1.000		

Analyte	Result	RL
alpha-BHC	ND	1.7
beta-BHC	ND	1.7
gamma-BHC	ND	1.7
delta-BHC	ND	1.7
Heptachlor	ND	1.7
Aldrin	ND	1.7
Heptachlor epoxide	ND	1.7
Endosulfan I	ND	1.7
Dieldrin	ND	1.7
4,4'-DDE	60	3.3
Endrin	ND	3.3
Endosulfan II	ND	3.3
Endosulfan sulfate	ND	3.3
4,4'-DDD	ND	3.3
Endrin aldehyde	ND	3.3
4,4'-DDT	21	3.3
alpha-Chlordane	ND	1.7
gamma-Chlordane	ND	1.7
Methoxychlor	ND	17
Toxaphene	ND	60

Surrogate	%REC	Limits
TCMX	80	42-134
Decachlorobiphenyl	63	29-122

ND= Not Detected
RL= Reporting Limit

Organochlorine Pesticides

Lab #:	257797	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	B15-0-0.5	Batch#:	212049
Lab ID:	257797-017	Sampled:	06/07/14
Matrix:	Soil	Received:	06/09/14
Units:	ug/Kg	Prepared:	06/10/14
Basis:	as received	Analyzed:	06/12/14

Analyte	Result	RL	Diln Fac
alpha-BHC	ND	1.7	1.000
beta-BHC	ND	1.7	1.000
gamma-BHC	ND	1.7	1.000
delta-BHC	ND	1.7	1.000
Heptachlor	ND	1.7	1.000
Aldrin	ND	1.7	1.000
Heptachlor epoxide	5.3	1.7	1.000
Endosulfan I	ND	1.7	1.000
Dieldrin	2.6	1.7	1.000
4,4'-DDE	18	3.3	1.000
Endrin	ND	3.3	1.000
Endosulfan II	6.0 C	3.3	1.000
Endosulfan sulfate	ND	3.3	1.000
4,4'-DDD	27	3.3	1.000
Endrin aldehyde	4.9 C	3.3	1.000
4,4'-DDT	33	3.3	1.000
alpha-Chlordane	220	17	10.00
gamma-Chlordane	190	17	10.00
Methoxychlor	ND	17	1.000
Toxaphene	ND	59	1.000

Surrogate	%REC	Limits	Diln Fac
TCMX	65	42-134	1.000
Decachlorobiphenyl	40	29-122	1.000

C= Presence confirmed, but RPD between columns exceeds 40%
ND= Not Detected
RL= Reporting Limit

Organochlorine Pesticides

Lab #:	257797	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	B15-1-1.5	Batch#:	212049
Lab ID:	257797-018	Sampled:	06/07/14
Matrix:	Soil	Received:	06/09/14
Units:	ug/Kg	Prepared:	06/10/14
Basis:	as received	Analyzed:	06/12/14
Diln Fac:	1.000		

Analyte	Result	RL
alpha-BHC	ND	1.7
beta-BHC	ND	1.7
gamma-BHC	ND	1.7
delta-BHC	ND	1.7
Heptachlor	ND	1.7
Aldrin	ND	1.7
Heptachlor epoxide	ND	1.7
Endosulfan I	ND	1.7
Dieldrin	ND	1.7
4,4'-DDE	14	3.3
Endrin	ND	3.3
Endosulfan II	ND	3.3
Endosulfan sulfate	ND	3.3
4,4'-DDD	ND	3.3
Endrin aldehyde	ND	3.3
4,4'-DDT	15	3.3
alpha-Chlordane	13	1.7
gamma-Chlordane	7.8	1.7
Methoxychlor	ND	17
Toxaphene	ND	60

Surrogate	%REC	Limits
TCMX	74	42-134
Decachlorobiphenyl	55	29-122

ND= Not Detected
RL= Reporting Limit

Batch QC Report

Organochlorine Pesticides			
Lab #:	257797	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC744228	Batch#:	212049
Matrix:	Soil	Prepared:	06/10/14
Units:	ug/Kg	Analyzed:	06/11/14

Analyte	Result	RL
alpha-BHC	ND	1.7
beta-BHC	ND	1.7
gamma-BHC	ND	1.7
delta-BHC	ND	1.7
Heptachlor	ND	1.7
Aldrin	ND	1.7
Heptachlor epoxide	ND	1.7
Endosulfan I	ND	1.7
Dieldrin	ND	1.7
4,4'-DDE	ND	3.3
Endrin	ND	3.3
Endosulfan II	ND	3.3
Endosulfan sulfate	ND	3.3
4,4'-DDD	ND	3.3
Endrin aldehyde	ND	3.3
4,4'-DDT	ND	3.3
alpha-Chlordane	ND	1.7
gamma-Chlordane	ND	1.7
Methoxychlor	ND	17
Toxaphene	ND	61

Surrogate	%REC	Limits
TCMX	80	42-134
Decachlorobiphenyl	65	29-122

ND= Not Detected

RL= Reporting Limit

Batch QC Report

Organochlorine Pesticides			
Lab #:	257797	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC744232	Batch#:	212049
Matrix:	Soil	Prepared:	06/10/14
Units:	ug/Kg	Analyzed:	06/11/14

Analyte	Spiked	Result	%REC	Limits
gamma-BHC	13.53	10.01	74	46-120
Heptachlor	13.53	10.52	78	41-124
Aldrin	13.53	10.62	78	48-122
Dieldrin	13.53	11.85	88	39-142
Endrin	13.53	10.82	80	45-138
4,4'-DDT	13.53	13.32	98	32-145

Surrogate	%REC	Limits
TCMX	72	42-134
Decachlorobiphenyl	63	29-122

Batch QC Report

Organochlorine Pesticides			
Lab #:	257797	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	B7-1-1.5	Batch#:	212049
MSS Lab ID:	257797-001	Sampled:	06/07/14
Matrix:	Soil	Received:	06/09/14
Units:	ug/Kg	Prepared:	06/10/14
Basis:	as received	Analyzed:	06/11/14
Diln Fac:	1.000		

Type: MS Lab ID: QC744233

Analyte	MSS Result	Spiked	Result	%REC	Limits
gamma-BHC	<0.2168	13.21	11.59	88	42-136
Heptachlor	<0.1922	13.21	11.89	90	40-144
Aldrin	<0.2055	13.21	11.22	85	45-143
Dieldrin	3.395	13.21	16.66	100	47-145
Endrin	<0.5621	13.21	13.01	98	46-150
4,4'-DDT	5.695	13.21	21.27	118	30-157

Surrogate	%REC	Limits
TCMX	79	42-134
Decachlorobiphenyl	61	29-122

Type: MSD Lab ID: QC744234

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
gamma-BHC	13.39	11.87	89	42-136	1	40
Heptachlor	13.39	11.76	88	40-144	2	46
Aldrin	13.39	11.03	82	45-143	3	41
Dieldrin	13.39	19.11	117	47-145	13	36
Endrin	13.39	13.28	99	46-150	1	41
4,4'-DDT	13.39	19.96	107	30-157	7	52

Surrogate	%REC	Limits
TCMX	73	42-134
Decachlorobiphenyl	59	29-122

RPD= Relative Percent Difference



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Analytical Laboratories, Since 1878



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2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

**Laboratory Job Number 255996
ANALYTICAL REPORT**

Terraphase Engineering
1404 Franklin Street
Oakland, CA 94612

Project : 0084.001.001
Location : 275 Elliott Drive
Level : II

Sample ID

B-7-0-0.5

B-8-0-0.5

Lab ID

255996-001

255996-002

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: _____

Tracy Babjar
Project Manager
tracy.babjar@ctberk.com
(510) 204-2226

Date: 05/02/2014

CA ELAP# 2896, NELAP# 4044-001

CASE NARRATIVE

Laboratory number: 255996
Client: Terraphase Engineering
Project: 0084.001.001
Location: 275 Elliott Drive
Request Date: 04/25/14
Samples Received: 04/16/14

This data package contains sample and QC results for two soil samples, requested for the above referenced project on 04/25/14. The samples were received cold and intact.

Pesticides (EPA 8081A):

All samples underwent sulfur cleanup using the copper option in EPA Method 3660B. All samples underwent florisil cleanup using EPA Method 3620C. Low recoveries were observed for endrin in the MS/MSD for batch 210475; the parent sample was not a project sample, the LCS was within limits, and the associated RPD was within limits. B-7-0-0.5 (lab # 255996-001) and B-8-0-0.5 (lab # 255996-002) were diluted due to the color of the sample extracts. No other analytical problems were encountered.

CT# 255996

Subject: RE: 0084.001.001 - C&T Data (255670)
From: Wendy Bellah <wendy.bellah@terrphase.com>
Date: 4/24/2014 4:45 PM
To: "tracy.babjar@ctberk.com" <tracy.babjar@ctberk.com>

Hi Tracy,

I would like to analyze B-8-O-0.5 (Lab ID: 23) and B-7-O-0.5 (Lab ID: 22) for OCPs.

From: Tracy Babjar [mailto:tracy.babjar@ctberk.com]
Sent: Thursday, April 24, 2014 9:06 AM
To: Wendy Bellah
Subject: 0084.001.001 - C&T Data (255670)

Hi Wendy,

Final report, edd and invoice.

Please find attached the following files:

- Invoice
- PDF Deliverable
- C&T standard format EDD (255670_standard.zip)

You may also access this data at <https://labline.ctberk.com/>

Email was also sent to: Jennifer.otto@terrphase.com, chris.jones@terrphase.com, kara.quantumontgomery@terrphase.com, npdeguzman@gmail.com, william.carson@terrphase.com

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ct **Curtis & Tompkins Laboratories**
ENVIRONMENTAL ANALYTICAL TESTING LABORATORY
In Business Since 1878

Phone (510) 486-0900
Fax (510) 486-0532

Page 1 of 23
Chain of Custody # _____

Project No: 0084.001.001	Sampler: Chris Jones
Project Name: 275 Elliott Drive	Report To: Wendy Bellah
Project P. O. No:	Company: Terraphase Engineering
EDD Format: Report Level <input checked="" type="checkbox"/> II <input type="checkbox"/> III <input type="checkbox"/> IV	Telephone: (510) 645-1850
Turnaround Time: <input type="checkbox"/> RUSH <input checked="" type="checkbox"/> Standard	Email: wendy.bellah@terraphase.com

Lab No.	Sample ID.	SAMPLING		MATRIX			# of Containers	CHEMICAL PRESERVATIVE				
		Date Collected	Time Collected	Water	Solid			HCl	H2SO4	HNO3	NaOH	None
1	S-1-0-0.5	4/14/14	1035	X			1					X
2	S-1/S-2-0-0.5	4/14/14	1050	X			1					X
3	S-3-0-0.5	4/14/14	0955	X			1					X
4	S-3/S-4-0-0.5	4/14/14	1000	X			1					X
5	S-5-0-0.5	4/14/14	1215	X			1					X
6	S-5/S-6-0-0.5	4/14/14	1220	X			1					X
7	S-7-0-0.5	4/15/14	1335	X			1					X
8	S-7/S-8-0-0.5	4/15/14	1340	X			1					X
9	S-9/S-10-0-0.5	4/14/14	1325	X			1					X
10	S-10-0-0.5	4/14/14	1315	X			1					X
11	S-11/S-12-0-0.5	4/15/14	1505	X			1					X
12	S-12-0-0.5	4/15/14	1430	X			1					X

[illegible]

**SAMPLE
RECEIPT**

☒ Intact
☐ Cold
☒ On Ice
☐ Ambient

RELINQUISHED BY:

DATE: 4/15/14 TIME: 1940

DATE: TIME:

DATE: TIME:

RECEIVED BY:

C+T

DATE:	TIME:
04/15/14	19:43
DATE:	TIME:

DATE: TIME:

CHAIN OF CUSTODY



2323 Fifth Street
Berkeley, CA 94710

Phone (510) 486-0900
Fax (510) 486-0532

Page 2 of 3

Chain of Custody # _____

C&T LOGIN # 255 670

Project No: 0089.001.001

Sampler: Chris Jones

Project Name: 275 Elliott Drive

Report To: Wendy Bellah

Project P. O. No:

Company: Terraplane Engineering

EDD Format:

Report Level ☒ II ☐ III ☐ IV

Telephone: (510) 645-1850

Turnaround Time: ☐ RUSH

☒ Standard

Email: wendy.bellah@terraplane.com

ANALYTICAL REQUEST

Lab No.	Sample ID.	SAMPLING		MATRIX		# of Containers	CHEMICAL PRESERVATIVE				
		Date Collected	Time Collected	Water	Solid		HCl	H2SO4	HNO3	NaOH	None
13	B-1-0-0.5	4/15/14	0945	X		1					X
14	B-1/B-2-0-0.5	4/15/14	1030	X		1					X
15	B-2-0-0.5	4/15/14	1015	X		1					X
16	B-3-0-0.5	4/15/14	1130	X		1					X
17	B-3/B-4-0-0.5	4/15/14	1140	X		1					X
18	B-4-0-0.5	4/14/14	1400	X		1					X
19	B-5-0-0.5	4/14/14	1415	X		1					X
20	B-5/B-6-0-0.5	4/14/14	1445	X		1					X
21	B-6-0-0.5	4/14/14	1435	X		1					X
22	B-7-0-0.5	4/14/14	1540	X		1					X
23	B-8-0-0.5	4/14/14	1630	X		2					X
24	B-7/B-8/B-9-0-0.5	4/15/14	0805	X		1					X
25	B-7/B-8/B-9-2.5-3	4/15/14	0820	X		1					X

(6010)
(8081)
(8082)
Lead
OCP
PCB

Notes:

SAMPLE RECEIPT

- ☐ Intact
☐ Cold
☐ On Ice
☐ Ambient

RELINQUISHED BY:

Chris Jones

4/15/14 1940
DATE: TIME:

DATE: TIME:

DATE: TIME:

RECEIVED BY:

C.T.

DATE: TIME:

4/15/14 1945
DATE: TIME:

DATE: TIME:

6 of 13

COOLER RECEIPT CHECKLIST



Curtis & Tompkins, Ltd.

Login # 255670 Date Received 04/15/14 Number of coolers 1
 Client TERRAPHASE ENGINEERING Project 275 ELLICOTT DRIVE

Date Opened 04/15/14 By (print) NY (sign) [Signature]
 Date Logged in 4/16 By (print) MT (sign) [Signature]

1. Did cooler come with a shipping slip (airbill, etc) YES (NO)
 Shipping info _____

2A. Were custody seals present? ☐ YES (circle) on cooler on samples ☒ (NO)
 How many _____ Name _____ Date _____

2B. Were custody seals intact upon arrival? _____ YES NO (N/A)

3. Were custody papers dry and intact when received? YES NO

4. Were custody papers filled out properly (ink, signed, etc)? YES NO

5. Is the project identifiable from custody papers? (If so fill out top of form) YES NO

6. Indicate the packing in cooler: (if other, describe) _____

☐ Bubble Wrap ☐ Foam blocks ☐ Bags ☒ None
☐ Cloth material ☐ Cardboard ☐ Styrofoam ☐ Paper towels

7. Temperature documentation: * Notify PM if temperature exceeds 6°C

Type of ice used: ☒ Wet ☐ Blue/Gel ☐ None Temp(°C) 2.7°C

☐ Samples Received on ice & cold without a temperature blank; temp. taken with IR gun

☐ Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? YES (NO)

If YES, what time were they transferred to freezer? _____

9. Did all bottles arrive unbroken/unopened? YES NO

10. Are there any missing / extra samples? YES (NO)

11. Are samples in the appropriate containers for indicated tests? YES NO

12. Are sample labels present, in good condition and complete? YES NO

13. Do the sample labels agree with custody papers? YES (NO)

14. Was sufficient amount of sample sent for tests requested? YES NO

15. Are the samples appropriately preserved? YES NO (N/A)

16. Did you check preservatives for all bottles for each sample? YES NO (N/A)

17. Did you document your preservative check? YES NO (N/A)

18. Did you change the hold time in LIMS for unpreserved VOAs? YES NO (N/A)

19. Did you change the hold time in LIMS for preserved terracores? YES NO (N/A)

20. Are bubbles > 6mm absent in VOA samples? YES NO (N/A)

21. Was the client contacted concerning this sample delivery? YES (NO)

If YES, Who was called? _____ By _____ Date: _____

COMMENTS

#13) - o/o. Marked as "S-10-0-0.5" on the jar, but
labeled as "S-10-0-0.5" on COC

Detections Summary for 255996

Client : Terraphase Engineering
Project : 0084.001.001
Location : 275 Elliott Drive

Client Sample ID : B-7-0-0.5 Laboratory Sample ID : 255996-001

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Heptachlor epoxide	32	C	8.5	1.1	ug/Kg	As Recd	5.000	EPA 8081A	EPA 3550B
Dieldrin	270		8.5	1.6	ug/Kg	As Recd	5.000	EPA 8081A	EPA 3550B
4,4'-DDE	57	#	16	2.9	ug/Kg	As Recd	5.000	EPA 8081A	EPA 3550B
4,4'-DDT	72		16	2.4	ug/Kg	As Recd	5.000	EPA 8081A	EPA 3550B
alpha-Chlordane	490	C	34	4.1	ug/Kg	As Recd	20.00	EPA 8081A	EPA 3550B
gamma-Chlordane	340		34	4.9	ug/Kg	As Recd	20.00	EPA 8081A	EPA 3550B

Client Sample ID : B-8-0-0.5 Laboratory Sample ID : 255996-002

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Heptachlor epoxide	19		8.4	1.1	ug/Kg	As Recd	5.000	EPA 8081A	EPA 3550B
Dieldrin	420		34	6.3	ug/Kg	As Recd	20.00	EPA 8081A	EPA 3550B
4,4'-DDE	93	#	16	2.9	ug/Kg	As Recd	5.000	EPA 8081A	EPA 3550B
Endrin aldehyde	18		16	1.7	ug/Kg	As Recd	5.000	EPA 8081A	EPA 3550B
4,4'-DDT	75		16	2.3	ug/Kg	As Recd	5.000	EPA 8081A	EPA 3550B
alpha-Chlordane	560	C	34	4.1	ug/Kg	As Recd	20.00	EPA 8081A	EPA 3550B
gamma-Chlordane	320		8.4	1.2	ug/Kg	As Recd	5.000	EPA 8081A	EPA 3550B

= CCV drift outside limits; average CCV drift within limits per method requirements
C = Presence confirmed, but RPD between columns exceeds 40%

Organochlorine Pesticides			
Lab #:	255996	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	B-7-0-0.5	Batch#:	210475
Lab ID:	255996-001	Sampled:	04/14/14
Matrix:	Soil	Received:	04/16/14
Units:	ug/Kg	Prepared:	04/25/14
Basis:	as received	Analyzed:	05/01/14

Analyte	Result	RL	Diln Fac
alpha-BHC	ND	8.5	5.000
beta-BHC	ND	8.5	5.000
gamma-BHC	ND	8.5	5.000
delta-BHC	ND	8.5	5.000
Heptachlor	ND	8.5	5.000
Aldrin	ND	8.5	5.000
Heptachlor epoxide	32 C	8.5	5.000
Endosulfan I	ND	8.5	5.000
Dieldrin	270	8.5	5.000
4,4'-DDE	57 #	16	5.000
Endrin	ND	16	5.000
Endosulfan II	ND	16	5.000
Endosulfan sulfate	ND	16	5.000
4,4'-DDD	ND	16	5.000
Endrin aldehyde	ND	16	5.000
4,4'-DDT	72	16	5.000
alpha-Chlordane	490 C	34	20.00
gamma-Chlordane	340	34	20.00
Methoxychlor	ND	85	5.000
Toxaphene	ND	300	5.000

Surrogate	%REC	Limits	Diln Fac
TCMX	125	42-134	5.000
Decachlorobiphenyl	93	29-122	5.000

#= CCV drift outside limits; average CCV drift within limits per method requirements

C= Presence confirmed, but RPD between columns exceeds 40%

ND= Not Detected

RL= Reporting Limit

Organochlorine Pesticides

Lab #:	255996	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	B-8-0-0.5	Batch#:	210475
Lab ID:	255996-002	Sampled:	04/14/14
Matrix:	Soil	Received:	04/16/14
Units:	ug/Kg	Prepared:	04/25/14
Basis:	as received	Analyzed:	05/01/14

Analyte	Result	RL	Diln Fac
alpha-BHC	ND	8.4	5.000
beta-BHC	ND	8.4	5.000
gamma-BHC	ND	8.4	5.000
delta-BHC	ND	8.4	5.000
Heptachlor	ND	8.4	5.000
Aldrin	ND	8.4	5.000
Heptachlor epoxide	19	8.4	5.000
Endosulfan I	ND	8.4	5.000
Dieldrin	420	34	20.00
4,4'-DDE	93 #	16	5.000
Endrin	ND	16	5.000
Endosulfan II	ND	16	5.000
Endosulfan sulfate	ND	16	5.000
4,4'-DDD	ND	16	5.000
Endrin aldehyde	18	16	5.000
4,4'-DDT	75	16	5.000
alpha-Chlordane	560 C	34	20.00
gamma-Chlordane	320	8.4	5.000
Methoxychlor	ND	84	5.000
Toxaphene	ND	300	5.000

Surrogate	%REC	Limits	Diln Fac
TCMX	126	42-134	5.000
Decachlorobiphenyl	86	29-122	5.000

#= CCV drift outside limits; average CCV drift within limits per method requirements

C= Presence confirmed, but RPD between columns exceeds 40%

ND= Not Detected

RL= Reporting Limit

Batch QC Report

Organochlorine Pesticides			
Lab #:	255996	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC737763	Batch#:	210475
Matrix:	Soil	Prepared:	04/25/14
Units:	ug/Kg	Analyzed:	05/01/14

Analyte	Result	RL
alpha-BHC	ND	1.7
beta-BHC	ND	1.7
gamma-BHC	ND	1.7
delta-BHC	ND	1.7
Heptachlor	ND	1.7
Aldrin	ND	1.7
Heptachlor epoxide	ND	1.7
Endosulfan I	ND	1.7
Dieldrin	ND	1.7
4,4'-DDE	ND	3.3
Endrin	ND	3.3
Endosulfan II	ND	3.3
Endosulfan sulfate	ND	3.3
4,4'-DDD	ND	3.3
Endrin aldehyde	ND	3.3
4,4'-DDT	ND	3.3
alpha-Chlordane	ND	1.7
gamma-Chlordane	ND	1.7
Methoxychlor	ND	17
Toxaphene	ND	60

Surrogate	%REC	Limits
TCMX	91	42-134
Decachlorobiphenyl	100	29-122

ND= Not Detected

RL= Reporting Limit

Batch QC Report

Organochlorine Pesticides			
Lab #:	255996	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC737764	Batch#:	210475
Matrix:	Soil	Prepared:	04/25/14
Units:	ug/Kg	Analyzed:	05/01/14

Analyte	Spiked	Result	%REC	Limits
gamma-BHC	13.18	13.67	104	46-120
Heptachlor	13.18	13.60	103	41-124
Aldrin	13.18	14.88	113	48-122
Dieldrin	13.18	13.38	102	39-142
Endrin	13.18	13.55	103	45-138
4,4'-DDT	13.18	11.61	88	32-145

Surrogate	%REC	Limits
TCMX	93	42-134
Decachlorobiphenyl	104	29-122

Batch QC Report

Organochlorine Pesticides			
Lab #:	255996	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	ZZZZZZZZZZ	Batch#:	210475
MSS Lab ID:	255989-002	Sampled:	04/24/14
Matrix:	Soil	Received:	04/24/14
Units:	ug/Kg	Prepared:	04/25/14
Basis:	as received	Analyzed:	05/01/14
Diln Fac:	5.000		

Type: MS Lab ID: QC737765

Analyte	MSS Result	Spiked	Result	%REC	Limits
gamma-BHC	<1.092	13.45	13.65	102	42-136
Heptachlor	<0.9677	13.45	16.18	120	40-144
Aldrin	<1.035	13.45	16.19	120	45-143
Dieldrin	13.79	13.45	22.34	64	47-145
Endrin	18.60	13.45	24.11	41 *	46-150
4,4'-DDT	279.5	13.45	195.2	-626 NM	30-157

Surrogate	%REC	Limits
TCMX	133	42-134
Decachlorobiphenyl	116	29-122

Type: MSD Lab ID: QC737766

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
gamma-BHC	13.34	11.30	85	42-136	18	40
Heptachlor	13.34	11.77	88	40-144	31	46
Aldrin	13.34	12.13	91	45-143	28	41
Dieldrin	13.34	24.26	79	47-145	9	36
Endrin	13.34	20.19	12 *	46-150	17	41
4,4'-DDT	13.34	188.1	-685 NM	30-157	4	52

Surrogate	%REC	Limits
TCMX	109	42-134
Decachlorobiphenyl	82	29-122

*= Value outside of QC limits; see narrative

NM= Not Meaningful: Sample concentration > 4X spike concentration

RPD= Relative Percent Difference





Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

**Laboratory Job Number 255670
ANALYTICAL REPORT**

Terraphase Engineering
1404 Franklin Street
Oakland, CA 94612

Project : 0084.001.001
Location : 275 Elliott Drive
Level : II

<u>Sample ID</u>	<u>Lab ID</u>	<u>Sample ID</u>	<u>Lab ID</u>
S-1-0-0.5	255670-001	B-2-0-0.5	255670-015
S-1/S-2-0-0.5	255670-002	B-3-0-0.5	255670-016
S-3-0-0.5	255670-003	B-3/B-4-0-0.5	255670-017
S-3/S-4-0-0.5	255670-004	B-4-0-0.5	255670-018
S-5-0-0.5	255670-005	B-5-0-0.5	255670-019
S-5/S-6-0-0.5	255670-006	B-5/B-6-0-0.5	255670-020
S-7-0-0.5	255670-007	B-6-0-0.5	255670-021
S-7/S-8-0-0.5	255670-008	B-7-0-0.5	255670-022
S-9/S-10-0-0.5	255670-009	B-8-0-0.5	255670-023
S-10-0-1.5	255670-010	B-7/B-8/B-9-0-0.5	255670-024
S-11/S-12-0-0.5	255670-011	B-7/B-8/B-9-2.5-3	255670-025
S-12-0-0.5	255670-012	B-10-0-0.5	255670-026
B-1-0-0.5	255670-013	B-11-0-0.5	255670-027
B-1/B-2-0-0.5	255670-014	B-12-0-0.5	255670-028

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAP and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: _____

Tracy Babjar
Project Manager
tracy.babjar@ctberk.com
(510) 204-2226

Date: 04/24/2014

CASE NARRATIVE

Laboratory number: 255670
Client: Terraphase Engineering
Project: 0084.001.001
Location: 275 Elliott Drive
Request Date: 04/16/14
Samples Received: 04/16/14

This data package contains sample and QC results for twenty eight soil samples, requested for the above referenced project on 04/16/14. The samples were received cold and intact.

Pesticides (EPA 8081A):

All samples underwent sulfur cleanup using the copper option in EPA Method 3660B. All samples underwent florisil cleanup using EPA Method 3620C. A number of samples were diluted due to the color of the sample extracts. No other analytical problems were encountered.

PCBs (EPA 8082):

All samples underwent sulfuric acid cleanup using EPA Method 3665A. All samples underwent sulfur cleanup using the copper option in EPA Method 3660B. Matrix spikes QC736267, QC736268 (batch 210095) were not reported because the parent sample required a dilution that would have diluted out the spikes. No other analytical problems were encountered.

Metals (EPA 6010B):

No analytical problems were encountered.

CHAIN OF CUSTODY



Page 1 of 23

Chain of Custody # _____

C&T LOGIN # 255670

2323 Fifth Street
Berkeley, CA 94710

Phone (510) 486-0900
Fax (510) 486-0532

Project No: 0084.001.001

Sampler: Chris Jones

Project Name: 275 Elliott Drive

Report To: Wendy Bellah

Project P. O. No: _____

Company: Terraphase Engineering

EDD Format: Report Level ☒ II ☐ III ☐ IV

Telephone: (510) 645-1850

Turnaround Time: ☐ RUSH ☒ Standard

Email: wendy.bellah@terrphase.com

Lab No.	Sample ID.	SAMPLING		MATRIX			# of Containers	CHEMICAL PRESERVATIVE				
		Date Collected	Time Collected	Water	Solid			HCl	H2SO4	HNO3	NaOH	None
1	S-1-0-0.5	4/14/14	1035	X			1					X
2	S-1/S-2-0-0.5	4/14/14	1050	X			1					X
3	S-3-0-0.5	4/14/14	0955	X			1					X
4	S-3/S-4-0-0.5	4/14/14	1000	X			1					X
5	S-5-0-0.5	4/14/14	1215	X			1					X
6	S-5/S-6-0-0.5	4/14/14	1220	X			1					X
7	S-7-0-0.5	4/15/14	1335	X			1					X
8	S-7/S-8-0-0.5	4/15/14	1340	X			1					X
9	S-9/S-10-0-0.5	4/14/14	1325	X			1					X
10	S-10-0-0.5	4/14/14	1315	X			1					X
11	S-11/S-12-0-0.5	4/15/14	1505	X			1					X
12	S-12-0-0.5	4/15/14	1430	X			1					X

ANALYTICAL REQUEST												
(6010)	(1801)											
Arsenic	OCF											
X	X											
X	X											
X	X											
X	X											
X	X											
X	X											
X	X											
X	X											
X	X											
X	X											
X	X											

Notes:

SAMPLE RECEIPT

- ☒ Intact
☐ Cold
☒ On Ice
☐ Ambient

RELINQUISHED BY:

Chris Jones

DATE: 4/15/14 TIME: 1940

DATE: _____ TIME: _____

DATE: _____ TIME: _____

RECEIVED BY:

C+T

DATE: _____ TIME: _____

Wendy Bellah

DATE: 4/15/14 TIME: 19:45

DATE: _____ TIME: _____

DATE: _____ TIME: _____

DATE: TIME:

COOLER RECEIPT CHECKLIST



Curtis & Tompkins, Ltd.

Login # 255670 Date Received 04/15/14 Number of coolers 1
Client TERRAPHASE ENGINEERING Project 275 ELLIOT DRIVE

Date Opened 04/15/14 By (print) NY (sign) [Signature]
Date Logged in 4/16 By (print) MT (sign) [Signature]

1. Did cooler come with a shipping slip (airbill, etc) YES NO
Shipping info _____

2A. Were custody seals present? ☐ YES (circle) on cooler on samples ☒ NO
How many _____ Name _____ Date _____

2B. Were custody seals intact upon arrival? _____ YES NO N/A

3. Were custody papers dry and intact when received? YES NO

4. Were custody papers filled out properly (ink, signed, etc)? YES NO

5. Is the project identifiable from custody papers? (If so fill out top of form) YES NO

6. Indicate the packing in cooler: (if other, describe) _____

☐ Bubble Wrap ☐ Foam blocks ☐ Bags ☒ None
☐ Cloth material ☐ Cardboard ☐ Styrofoam ☐ Paper towels

7. Temperature documentation: * Notify PM if temperature exceeds 6°C

Type of ice used: ☒ Wet ☐ Blue/Gel ☐ None Temp(°C) 2.7°C

☐ Samples Received on ice & cold without a temperature blank; temp. taken with IR gun

☐ Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? _____ YES NO
If YES, what time were they transferred to freezer? _____

9. Did all bottles arrive unbroken/unopened? YES NO

10. Are there any missing / extra samples? _____ YES NO

11. Are samples in the appropriate containers for indicated tests? YES NO

12. Are sample labels present, in good condition and complete? YES NO

13. Do the sample labels agree with custody papers? _____ YES NO

14. Was sufficient amount of sample sent for tests requested? YES NO

15. Are the samples appropriately preserved? _____ YES NO N/A

16. Did you check preservatives for all bottles for each sample? _____ YES NO N/A

17. Did you document your preservative check? _____ YES NO N/A

18. Did you change the hold time in LIMS for unpreserved VOAs? _____ YES NO N/A

19. Did you change the hold time in LIMS for preserved terracores? _____ YES NO N/A

20. Are bubbles > 6mm absent in VOA samples? _____ YES NO N/A

21. Was the client contacted concerning this sample delivery? _____ YES NO

If YES, Who was called? _____ By _____ Date: _____

COMMENTS

#13) - o/o. Marked as "S-10-0-0.5" on the jar, but
labeled as "S-10-0-0.5" on COC

Detections Summary for 255670

Client : Terraphase Engineering
Project : 0084.001.001
Location : 275 Elliott Drive

Client Sample ID : S-1-0-0.5 Laboratory Sample ID : 255670-001

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Arsenic	9.4		0.24	0.069	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B

Client Sample ID : S-1/S-2-0-0.5 Laboratory Sample ID : 255670-002

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
4,4'-DDE	240	C	33	3.3	ug/Kg	As Recd	10.00	EPA 8081A	EPA 3550B
4,4'-DDD	3.4		3.3	0.68	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDT	260		33	3.2	ug/Kg	As Recd	10.00	EPA 8081A	EPA 3550B
gamma-Chlordane	2.3	C	1.7	0.15	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B

Client Sample ID : S-3-0-0.5 Laboratory Sample ID : 255670-003

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Arsenic	4.0		0.24	0.071	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B

Client Sample ID : S-3/S-4-0-0.5 Laboratory Sample ID : 255670-004

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
4,4'-DDE	61		9.8	0.90	ug/Kg	As Recd	3.000	EPA 8081A	EPA 3550B
4,4'-DDT	16		9.8	2.1	ug/Kg	As Recd	3.000	EPA 8081A	EPA 3550B

Client Sample ID : S-5-0-0.5 Laboratory Sample ID : 255670-005

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Arsenic	4.1		0.25	0.072	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B

Client Sample ID : S-5/S-6-0-0.5 Laboratory Sample ID : 255670-006

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
4,4'-DDE	47		9.8	0.90	ug/Kg	As Recd	3.000	EPA 8081A	EPA 3550B
4,4'-DDT	29		9.8	2.1	ug/Kg	As Recd	3.000	EPA 8081A	EPA 3550B

Client Sample ID : S-7-0-0.5 Laboratory Sample ID : 255670-007

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Arsenic	4.5		0.27	0.078	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B

Client Sample ID : S-7/S-8-0-0.5

Laboratory Sample ID :

255670-008

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
4,4'-DDE	35		16	1.5	ug/Kg	As Recd	5.000	EPA 8081A	EPA 3550B
4,4'-DDT	19	C	16	3.5	ug/Kg	As Recd	5.000	EPA 8081A	EPA 3550B

Client Sample ID : S-9/S-10-0-0.5

Laboratory Sample ID :

255670-009

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Dieldrin	3.2	#	1.7	0.32	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDE	88	C	3.3	0.30	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDT	75		3.3	0.71	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
alpha-Chlordane	2.2		1.7	0.21	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
gamma-Chlordane	2.1		1.7	0.15	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B

Client Sample ID : S-10-0-1.5

Laboratory Sample ID :

255670-010

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Arsenic	6.8		0.26	0.075	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B

Client Sample ID : S-11/S-12-0-0.5

Laboratory Sample ID :

255670-011

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
4,4'-DDE	33		3.3	0.31	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDT	22		3.3	0.72	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B

Client Sample ID : S-12-0-0.5

Laboratory Sample ID :

255670-012

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Arsenic	3.2		0.27	0.079	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B

Client Sample ID : B-1-0-0.5

Laboratory Sample ID :

255670-013

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Lead	5.2		0.24	0.066	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B

Client Sample ID : B-1/B-2-0-0.5

Laboratory Sample ID :

255670-014

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
4,4'-DDE	60	C	3.3	0.30	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDT	24		3.3	0.71	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B

Client Sample ID : B-2-0-0.5

Laboratory Sample ID :

255670-015

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Lead	3.3		0.26	0.073	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B

Client Sample ID : B-3-0-0.5

Laboratory Sample ID :

255670-016

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Lead	11		0.27	0.075	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B

Client Sample ID : B-3/B-4-0-0.5

Laboratory Sample ID :

255670-017

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
4,4'-DDE	34		9.8	0.90	ug/Kg	As Recd	3.000	EPA 8081A	EPA 3550B
4,4'-DDT	27		9.8	2.1	ug/Kg	As Recd	3.000	EPA 8081A	EPA 3550B
alpha-Chlordane	8.0		5.0	0.63	ug/Kg	As Recd	3.000	EPA 8081A	EPA 3550B
gamma-Chlordane	5.9		5.0	0.44	ug/Kg	As Recd	3.000	EPA 8081A	EPA 3550B

Client Sample ID : B-4-0-0.5

Laboratory Sample ID :

255670-018

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Lead	17		0.25	0.068	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B

Client Sample ID : B-5-0-0.5

Laboratory Sample ID :

255670-019

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Lead	16		0.23	0.063	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B

Client Sample ID : B-5/B-6-0-0.5

Laboratory Sample ID :

255670-020

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Dieldrin	15	#,C	8.5	1.6	ug/Kg	As Recd	5.000	EPA 8081A	EPA 3550B
4,4'-DDE	28	C	16	1.5	ug/Kg	As Recd	5.000	EPA 8081A	EPA 3550B
4,4'-DDT	24	C	16	3.5	ug/Kg	As Recd	5.000	EPA 8081A	EPA 3550B

Client Sample ID : B-6-0-0.5

Laboratory Sample ID :

255670-021

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Lead	23		0.27	0.075	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B

Client Sample ID : B-7-0-0.5

Laboratory Sample ID :

255670-022

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Lead	49		0.24	0.066	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B

Client Sample ID : B-8-0-0.5

Laboratory Sample ID :

255670-023

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Lead	47		0.24	0.066	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B

Client Sample ID : B-7/B-8/B-9-0-0.5

Laboratory Sample ID :

255670-024

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Heptachlor epoxide	6.4		1.7	0.20	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
Dieldrin	120		17	3.7	ug/Kg	As Recd	10.00	EPA 8081A	EPA 3550B
4,4'-DDE	69	C	3.3	0.30	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
Endrin	4.7		3.3	0.52	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDD	31	C	3.3	0.68	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDT	59		3.3	0.71	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
alpha-Chlordane	110		17	1.8	ug/Kg	As Recd	10.00	EPA 8081A	EPA 3550B
gamma-Chlordane	90		17	1.7	ug/Kg	As Recd	10.00	EPA 8081A	EPA 3550B

Client Sample ID : B-7/B-8/B-9-2.5-3

Laboratory Sample ID :

255670-025

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Dieldrin	2.8	#	1.7	0.32	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B
4,4'-DDE	4.2		3.3	0.31	ug/Kg	As Recd	1.000	EPA 8081A	EPA 3550B

Client Sample ID : B-10-0-0.5

Laboratory Sample ID :

255670-026

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Lead	13		0.27	0.075	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B

Client Sample ID : B-11-0-0.5

Laboratory Sample ID :

255670-027

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Lead	18		0.26	0.073	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B

Client Sample ID : B-12-0-0.5

Laboratory Sample ID :

255670-028

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Lead	12		0.24	0.067	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B

= CCV drift outside limits; average CCV drift within limits per method requirement
C = Presence confirmed, but RPD between columns exceeds 40%

Organochlorine Pesticides

Lab #:	255670	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	S-1/S-2-0-0.5	Batch#:	210181
Lab ID:	255670-002	Sampled:	04/14/14
Matrix:	Soil	Received:	04/16/14
Units:	ug/Kg	Prepared:	04/18/14
Basis:	as received		

Analyte	Result	RL	Diln Fac	Analyzed
alpha-BHC	ND	1.7	1.000	04/21/14
beta-BHC	ND	1.7	1.000	04/21/14
gamma-BHC	ND	1.7	1.000	04/21/14
delta-BHC	ND	1.7	1.000	04/21/14
Heptachlor	ND	1.7	1.000	04/21/14
Aldrin	ND	1.7	1.000	04/21/14
Heptachlor epoxide	ND	1.7	1.000	04/21/14
Endosulfan I	ND	1.7	1.000	04/21/14
Dieldrin	ND	1.7	1.000	04/21/14
4,4'-DDE	240 C	33	10.00	04/22/14
Endrin	ND	3.3	1.000	04/21/14
Endosulfan II	ND	3.3	1.000	04/21/14
Endosulfan sulfate	ND	3.3	1.000	04/21/14
4,4'-DDD	3.4	3.3	1.000	04/21/14
Endrin aldehyde	ND #	3.3	1.000	04/21/14
4,4'-DDT	260	33	10.00	04/22/14
alpha-Chlordane	ND	1.7	1.000	04/21/14
gamma-Chlordane	2.3 C	1.7	1.000	04/21/14
Methoxychlor	ND	17	1.000	04/21/14
Toxaphene	ND	61	1.000	04/21/14

Surrogate	%REC	Limits	Diln Fac	Analyzed
TCMX	45	42-134	1.000	04/21/14
Decachlorobiphenyl	50	29-122	1.000	04/21/14

#= CCV drift outside limits; average CCV drift within limits per method requirements

C= Presence confirmed, but RPD between columns exceeds 40%

ND= Not Detected

RL= Reporting Limit

Organochlorine Pesticides			
Lab #:	255670	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	S-3/S-4-0-0.5	Batch#:	210181
Lab ID:	255670-004	Sampled:	04/14/14
Matrix:	Soil	Received:	04/16/14
Units:	ug/Kg	Prepared:	04/18/14
Basis:	as received	Analyzed:	04/21/14
Diln Fac:	3.000		

Analyte	Result	RL
alpha-BHC	ND	5.0
beta-BHC	ND	5.0
gamma-BHC	ND	5.0
delta-BHC	ND	5.0
Heptachlor	ND	5.0
Aldrin	ND	5.0
Heptachlor epoxide	ND	5.0
Endosulfan I	ND	5.0
Dieldrin	ND	5.0
4,4'-DDE	61	9.8
Endrin	ND	9.8
Endosulfan II	ND	9.8
Endosulfan sulfate	ND	9.8
4,4'-DDD	ND	9.8
Endrin aldehyde	ND #	9.8
4,4'-DDT	16	9.8
alpha-Chlordane	ND	5.0
gamma-Chlordane	ND	5.0
Methoxychlor	ND	50
Toxaphene	ND	180

Surrogate	%REC	Limits
TCMX	107	42-134
Decachlorobiphenyl	81	29-122

#= CCV drift outside limits; average CCV drift within limits per method requirements
ND= Not Detected
RL= Reporting Limit

Organochlorine Pesticides

Lab #:	255670	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	S-5/S-6-0-0.5	Batch#:	210181
Lab ID:	255670-006	Sampled:	04/14/14
Matrix:	Soil	Received:	04/16/14
Units:	ug/Kg	Prepared:	04/18/14
Basis:	as received	Analyzed:	04/21/14
Diln Fac:	3.000		

Analyte	Result	RL
alpha-BHC	ND	5.1
beta-BHC	ND	5.1
gamma-BHC	ND	5.1
delta-BHC	ND	5.1
Heptachlor	ND	5.1
Aldrin	ND	5.1
Heptachlor epoxide	ND	5.1
Endosulfan I	ND	5.1
Dieldrin	ND	5.1
4,4'-DDE	47	9.8
Endrin	ND	9.8
Endosulfan II	ND	9.8
Endosulfan sulfate	ND	9.8
4,4'-DDD	ND	9.8
Endrin aldehyde	ND #	9.8
4,4'-DDT	29	9.8
alpha-Chlordane	ND	5.1
gamma-Chlordane	ND	5.1
Methoxychlor	ND	51
Toxaphene	ND	180

Surrogate	%REC	Limits
TCMX	82	42-134
Decachlorobiphenyl	61	29-122

#= CCV drift outside limits; average CCV drift within limits per method requirements
ND= Not Detected
RL= Reporting Limit

Organochlorine Pesticides

Lab #:	255670	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	S-7/S-8-0-0.5	Batch#:	210181
Lab ID:	255670-008	Sampled:	04/15/14
Matrix:	Soil	Received:	04/16/14
Units:	ug/Kg	Prepared:	04/18/14
Basis:	as received	Analyzed:	04/21/14
Diln Fac:	5.000		

Analyte	Result	RL
alpha-BHC	ND	8.4
beta-BHC	ND	8.4
gamma-BHC	ND	8.4
delta-BHC	ND	8.4
Heptachlor	ND	8.4
Aldrin	ND	8.4
Heptachlor epoxide	ND	8.4
Endosulfan I	ND	8.4
Dieldrin	ND	8.4
4,4'-DDE	35	16
Endrin	ND	16
Endosulfan II	ND	16
Endosulfan sulfate	ND	16
4,4'-DDD	ND	16
Endrin aldehyde	ND #	16
4,4'-DDT	19 C	16
alpha-Chlordane	ND	8.4
gamma-Chlordane	ND	8.4
Methoxychlor	ND	84
Toxaphene	ND	300

Surrogate	%REC	Limits
TCMX	99	42-134
Decachlorobiphenyl	80	29-122

#= CCV drift outside limits; average CCV drift within limits per method requirements

C= Presence confirmed, but RPD between columns exceeds 40%

ND= Not Detected

RL= Reporting Limit

Organochlorine Pesticides

Lab #:	255670	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	S-9/S-10-0-0.5	Batch#:	210181
Lab ID:	255670-009	Sampled:	04/14/14
Matrix:	Soil	Received:	04/16/14
Units:	ug/Kg	Prepared:	04/18/14
Basis:	as received	Analyzed:	04/21/14
Diln Fac:	1.000		

Analyte	Result	RL
alpha-BHC	ND	1.7
beta-BHC	ND	1.7
gamma-BHC	ND	1.7
delta-BHC	ND	1.7
Heptachlor	ND	1.7
Aldrin	ND	1.7
Heptachlor epoxide	ND	1.7
Endosulfan I	ND	1.7
Dieldrin	3.2 #	1.7
4,4'-DDE	88 C	3.3
Endrin	ND	3.3
Endosulfan II	ND	3.3
Endosulfan sulfate	ND	3.3
4,4'-DDD	ND	3.3
Endrin aldehyde	ND #	3.3
4,4'-DDT	75	3.3
alpha-Chlordane	2.2	1.7
gamma-Chlordane	2.1	1.7
Methoxychlor	ND	17
Toxaphene	ND	60

Surrogate	%REC	Limits
TCMX	84	42-134
Decachlorobiphenyl	84	29-122

#= CCV drift outside limits; average CCV drift within limits per method requirements

C= Presence confirmed, but RPD between columns exceeds 40%

ND= Not Detected

RL= Reporting Limit

Organochlorine Pesticides

Lab #:	255670	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	S-11/S-12-0-0.5	Batch#:	210181
Lab ID:	255670-011	Sampled:	04/15/14
Matrix:	Soil	Received:	04/16/14
Units:	ug/Kg	Prepared:	04/18/14
Basis:	as received	Analyzed:	04/21/14
Diln Fac:	1.000		

Analyte	Result	RL
alpha-BHC	ND	1.7
beta-BHC	ND	1.7
gamma-BHC	ND	1.7
delta-BHC	ND	1.7
Heptachlor	ND	1.7
Aldrin	ND	1.7
Heptachlor epoxide	ND	1.7
Endosulfan I	ND	1.7
Dieldrin	ND	1.7
4,4'-DDE	33	3.3
Endrin	ND	3.3
Endosulfan II	ND	3.3
Endosulfan sulfate	ND	3.3
4,4'-DDD	ND	3.3
Endrin aldehyde	ND #	3.3
4,4'-DDT	22	3.3
alpha-Chlordane	ND	1.7
gamma-Chlordane	ND	1.7
Methoxychlor	ND	17
Toxaphene	ND	61

Surrogate	%REC	Limits
TCMX	87	42-134
Decachlorobiphenyl	81	29-122

#= CCV drift outside limits; average CCV drift within limits per method requirements
ND= Not Detected
RL= Reporting Limit

Organochlorine Pesticides

Lab #:	255670	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	B-1/B-2-0-0.5	Batch#:	210181
Lab ID:	255670-014	Sampled:	04/15/14
Matrix:	Soil	Received:	04/16/14
Units:	ug/Kg	Prepared:	04/18/14
Basis:	as received	Analyzed:	04/21/14
Diln Fac:	1.000		

Analyte	Result	RL
alpha-BHC	ND	1.7
beta-BHC	ND	1.7
gamma-BHC	ND	1.7
delta-BHC	ND	1.7
Heptachlor	ND	1.7
Aldrin	ND	1.7
Heptachlor epoxide	ND	1.7
Endosulfan I	ND	1.7
Dieldrin	ND	1.7
4,4'-DDE	60 C	3.3
Endrin	ND	3.3
Endosulfan II	ND	3.3
Endosulfan sulfate	ND	3.3
4,4'-DDD	ND	3.3
Endrin aldehyde	ND #	3.3
4,4'-DDT	24	3.3
alpha-Chlordane	ND	1.7
gamma-Chlordane	ND	1.7
Methoxychlor	ND	17
Toxaphene	ND	60

Surrogate	%REC	Limits
TCMX	90	42-134
Decachlorobiphenyl	82	29-122

#= CCV drift outside limits; average CCV drift within limits per method requirements

C= Presence confirmed, but RPD between columns exceeds 40%

ND= Not Detected

RL= Reporting Limit

Organochlorine Pesticides

Lab #:	255670	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	B-3/B-4-0-0.5	Batch#:	210181
Lab ID:	255670-017	Sampled:	04/15/14
Matrix:	Soil	Received:	04/16/14
Units:	ug/Kg	Prepared:	04/18/14
Basis:	as received	Analyzed:	04/21/14
Diln Fac:	3.000		

Analyte	Result	RL
alpha-BHC	ND	5.0
beta-BHC	ND	5.0
gamma-BHC	ND	5.0
delta-BHC	ND	5.0
Heptachlor	ND	5.0
Aldrin	ND	5.0
Heptachlor epoxide	ND	5.0
Endosulfan I	ND	5.0
Dieldrin	ND	5.0
4,4'-DDE	34	9.8
Endrin	ND	9.8
Endosulfan II	ND	9.8
Endosulfan sulfate	ND	9.8
4,4'-DDD	ND	9.8
Endrin aldehyde	ND #	9.8
4,4'-DDT	27	9.8
alpha-Chlordane	8.0	5.0
gamma-Chlordane	5.9	5.0
Methoxychlor	ND	50
Toxaphene	ND	180

Surrogate	%REC	Limits
TCMX	96	42-134
Decachlorobiphenyl	74	29-122

#= CCV drift outside limits; average CCV drift within limits per method requirements
ND= Not Detected
RL= Reporting Limit

Organochlorine Pesticides

Lab #:	255670	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	B-5/B-6-0-0.5	Batch#:	210181
Lab ID:	255670-020	Sampled:	04/14/14
Matrix:	Soil	Received:	04/16/14
Units:	ug/Kg	Prepared:	04/18/14
Basis:	as received	Analyzed:	04/21/14
Diln Fac:	5.000		

Analyte	Result	RL
alpha-BHC	ND	8.5
beta-BHC	ND	8.5
gamma-BHC	ND	8.5
delta-BHC	ND	8.5
Heptachlor	ND	8.5
Aldrin	ND	8.5
Heptachlor epoxide	ND	8.5
Endosulfan I	ND	8.5
Dieldrin	15 C #	8.5
4,4'-DDE	28 C	16
Endrin	ND	16
Endosulfan II	ND	16
Endosulfan sulfate	ND	16
4,4'-DDD	ND	16
Endrin aldehyde	ND #	16
4,4'-DDT	24 C	16
alpha-Chlordane	ND	8.5
gamma-Chlordane	ND	8.5
Methoxychlor	ND	85
Toxaphene	ND	300

Surrogate	%REC	Limits
TCMX	93	42-134
Decachlorobiphenyl	58	29-122

#= CCV drift outside limits; average CCV drift within limits per method requirements

C= Presence confirmed, but RPD between columns exceeds 40%

ND= Not Detected

RL= Reporting Limit

Organochlorine Pesticides

Lab #:	255670	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	B-7/B-8/B-9-0-0.5	Batch#:	210181
Lab ID:	255670-024	Sampled:	04/15/14
Matrix:	Soil	Received:	04/16/14
Units:	ug/Kg	Prepared:	04/18/14
Basis:	as received		

Analyte	Result	RL	Diln Fac	Analyzed
alpha-BHC	ND	1.7	1.000	04/21/14
beta-BHC	ND	1.7	1.000	04/21/14
gamma-BHC	ND	1.7	1.000	04/21/14
delta-BHC	ND	1.7	1.000	04/21/14
Heptachlor	ND	1.7	1.000	04/21/14
Aldrin	ND	1.7	1.000	04/21/14
Heptachlor epoxide	6.4	1.7	1.000	04/21/14
Endosulfan I	ND	1.7	1.000	04/21/14
Dieldrin	120	17	10.00	04/22/14
4,4'-DDE	69 C	3.3	1.000	04/21/14
Endrin	4.7	3.3	1.000	04/21/14
Endosulfan II	ND	3.3	1.000	04/21/14
Endosulfan sulfate	ND	3.3	1.000	04/21/14
4,4'-DDD	31 C	3.3	1.000	04/21/14
Endrin aldehyde	ND #	3.3	1.000	04/21/14
4,4'-DDT	59	3.3	1.000	04/21/14
alpha-Chlordane	110	17	10.00	04/22/14
gamma-Chlordane	90	17	10.00	04/22/14
Methoxychlor	ND	17	1.000	04/21/14
Toxaphene	ND	60	1.000	04/21/14

Surrogate	%REC	Limits	Diln Fac	Analyzed
TCMX	78	42-134	1.000	04/21/14
Decachlorobiphenyl	75	29-122	1.000	04/21/14

#= CCV drift outside limits; average CCV drift within limits per method requirements

C= Presence confirmed, but RPD between columns exceeds 40%

ND= Not Detected

RL= Reporting Limit

Organochlorine Pesticides

Lab #:	255670	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	B-7/B-8/B-9-2.5-3	Batch#:	210181
Lab ID:	255670-025	Sampled:	04/15/14
Matrix:	Soil	Received:	04/16/14
Units:	ug/Kg	Prepared:	04/18/14
Basis:	as received	Analyzed:	04/21/14
Diln Fac:	1.000		

Analyte	Result	RL
alpha-BHC	ND	1.7
beta-BHC	ND	1.7
gamma-BHC	ND	1.7
delta-BHC	ND	1.7
Heptachlor	ND	1.7
Aldrin	ND	1.7
Heptachlor epoxide	ND	1.7
Endosulfan I	ND	1.7
Dieldrin	2.8 #	1.7
4,4'-DDE	4.2	3.3
Endrin	ND	3.3
Endosulfan II	ND	3.3
Endosulfan sulfate	ND	3.3
4,4'-DDD	ND	3.3
Endrin aldehyde	ND #	3.3
4,4'-DDT	ND	3.3
alpha-Chlordane	ND	1.7
gamma-Chlordane	ND	1.7
Methoxychlor	ND	17
Toxaphene	ND	60

Surrogate	%REC	Limits
TCMX	85	42-134
Decachlorobiphenyl	76	29-122

#= CCV drift outside limits; average CCV drift within limits per method requirements
 ND= Not Detected
 RL= Reporting Limit

Batch QC Report

Organochlorine Pesticides			
Lab #:	255670	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC736582	Batch#:	210181
Matrix:	Soil	Prepared:	04/17/14
Units:	ug/Kg	Analyzed:	04/18/14

Analyte	Result	RL
alpha-BHC	ND	1.7
beta-BHC	ND	1.7
gamma-BHC	ND	1.7
delta-BHC	ND	1.7
Heptachlor	ND	1.7
Aldrin	ND	1.7
Heptachlor epoxide	ND	1.7
Endosulfan I	ND	1.7
Dieldrin	ND	1.7
4,4'-DDE	ND	3.3
Endrin	ND	3.3
Endosulfan II	ND	3.3
Endosulfan sulfate	ND	3.3
4,4'-DDD	ND	3.3
Endrin aldehyde	ND	3.3
4,4'-DDT	ND	3.3
alpha-Chlordane	ND	1.7
gamma-Chlordane	ND	1.7
Methoxychlor	ND	17
Toxaphene	ND	60

Surrogate	%REC	Limits
TCMX	89	42-134
Decachlorobiphenyl	89	29-122

ND= Not Detected

RL= Reporting Limit

Batch QC Report

Organochlorine Pesticides			
Lab #:	255670	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC736586	Batch#:	210181
Matrix:	Soil	Prepared:	04/17/14
Units:	ug/Kg	Analyzed:	04/18/14

Analyte	Spiked	Result	%REC	Limits
gamma-BHC	13.44	11.74 #	87	46-120
Heptachlor	13.44	12.00	89	41-124
Aldrin	13.44	11.68	87	48-122
Dieldrin	13.44	12.08 #	90	39-142
Endrin	13.44	12.78	95	45-138
4,4'-DDT	13.44	12.65	94	32-145

Surrogate	%REC	Limits
TCMX	82	42-134
Decachlorobiphenyl	80	29-122

#= CCV drift outside limits; average CCV drift within limits per method requirements

Batch QC Report

Organochlorine Pesticides			
Lab #:	255670	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8081A
Field ID:	ZZZZZZZZZZ	Batch#:	210181
MSS Lab ID:	255710-001	Sampled:	04/15/14
Matrix:	Soil	Received:	04/17/14
Units:	ug/Kg	Prepared:	04/17/14
Basis:	as received	Analyzed:	04/18/14
Diln Fac:	1.000		

Type: MS Lab ID: QC736587

Analyte	MSS Result	Spiked	Result	%REC	Limits
gamma-BHC	<0.1816	13.55	12.06 #	89	42-136
Heptachlor	<0.2174	13.55	10.22	75	40-144
Aldrin	<0.1812	13.55	12.03	89	45-143
Dieldrin	<0.3219	13.55	12.60 #	93	47-145
Endrin	<0.5248	13.55	13.79	102	46-150
4,4'-DDT	3.742	13.55	14.30	78	30-157

Surrogate	%REC	Limits
TCMX	85	42-134
Decachlorobiphenyl	69	29-122

Type: MSD Lab ID: QC736588

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
gamma-BHC	13.39	14.27 #	107	42-136	18	40
Heptachlor	13.39	13.55	101	40-144	29	46
Aldrin	13.39	13.26	99	45-143	11	41
Dieldrin	13.39	13.90 #	104	47-145	11	36
Endrin	13.39	15.94	119	46-150	16	41
4,4'-DDT	13.39	20.22	123	30-157	35	52

Surrogate	%REC	Limits
TCMX	92	42-134
Decachlorobiphenyl	90	29-122

#= CCV drift outside limits; average CCV drift within limits per method requirements
RPD= Relative Percent Difference

Polychlorinated Biphenyls (PCBs)

Lab #:	255670	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8082
Field ID:	B-8-0-0.5	Diln Fac:	1.000
Matrix:	Soil	Batch#:	210095
Units:	ug/Kg	Sampled:	04/14/14
Basis:	as received	Received:	04/16/14

Type: SAMPLE Prepared: 04/16/14
Lab ID: 255670-023 Analyzed: 04/17/14

Analyte	Result	RL
Aroclor-1016	ND	12
Aroclor-1221	ND	24
Aroclor-1232	ND	12
Aroclor-1242	ND	12
Aroclor-1248	ND	12
Aroclor-1254	ND	12
Aroclor-1260	ND	12

Surrogate	%REC	Limits
TCMX	120	60-140
Decachlorobiphenyl	85	36-133

Type: BLANK Prepared: 04/15/14
Lab ID: QC736261 Analyzed: 04/16/14

Analyte	Result	RL
Aroclor-1016	ND	9.7
Aroclor-1221	ND	19
Aroclor-1232	ND	9.7
Aroclor-1242	ND	9.7
Aroclor-1248	ND	9.7
Aroclor-1254	ND	9.7
Aroclor-1260	ND	9.7

Surrogate	%REC	Limits
TCMX	97	60-140
Decachlorobiphenyl	88	36-133

ND= Not Detected
RL= Reporting Limit

Batch QC Report

Polychlorinated Biphenyls (PCBs)			
Lab #:	255670	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8082
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC736262	Batch#:	210095
Matrix:	Soil	Prepared:	04/15/14
Units:	ug/Kg	Analyzed:	04/16/14

Analyte	Spiked	Result	%REC	Limits
Aroclor-1016	168.1	146.0	87	58-144
Aroclor-1260	168.1	139.0	83	55-146

Surrogate	%REC	Limits
TCMX	96	60-140
Decachlorobiphenyl	65	36-133

Batch QC Report

Polychlorinated Biphenyls (PCBs)			
Lab #:	255670	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0084.001.001	Analysis:	EPA 8082
Field ID:	ZZZZZZZZZZ	Batch#:	210095
MSS Lab ID:	255637-002	Sampled:	04/15/14
Matrix:	Soil	Received:	04/15/14
Units:	ug/Kg	Prepared:	04/15/14
Basis:	as received	Analyzed:	04/16/14
Diln Fac:	1.000		

Type: MS Lab ID: QC736263

Analyte	MSS Result	Spiked	Result	%REC	Limits
Aroclor-1016	<2.394	168.1	150.4	89	51-155
Aroclor-1260	6.207	168.1	126.7	72	38-155

Surrogate	%REC	Limits
TCMX	92	60-140
Decachlorobiphenyl	36	36-133

Type: MSD Lab ID: QC736264

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Aroclor-1016	165.4	150.7	91	51-155	2	38
Aroclor-1260	165.4	130.5	75	38-155	4	55

Surrogate	%REC	Limits
TCMX	93	60-140
Decachlorobiphenyl	48	36-133

RPD= Relative Percent Difference

Arsenic			
Lab #:	255670	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3050B
Project#:	0084.001.001	Analysis:	EPA 6010B
Analyte:	Arsenic	Diln Fac:	1.000
Matrix:	Soil	Batch#:	210184
Units:	mg/Kg	Received:	04/16/14
Basis:	as received	Prepared:	04/18/14

Field ID	Type	Lab ID	Result	RL	Sampled	Analyzed
S-1-0-0.5	SAMPLE	255670-001	9.4	0.24	04/14/14	04/22/14
S-3-0-0.5	SAMPLE	255670-003	4.0	0.24	04/14/14	04/22/14
S-5-0-0.5	SAMPLE	255670-005	4.1	0.25	04/14/14	04/22/14
S-7-0-0.5	SAMPLE	255670-007	4.5	0.27	04/15/14	04/22/14
S-10-0-1.5	SAMPLE	255670-010	6.8	0.26	04/14/14	04/22/14
S-12-0-0.5	SAMPLE	255670-012	3.2	0.27	04/15/14	04/22/14
	BLANK	QC736598	ND	0.25		04/18/14

ND= Not Detected
 RL= Reporting Limit

Lead			
Lab #:	255670	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3050B
Project#:	0084.001.001	Analysis:	EPA 6010B
Analyte:	Lead	Diln Fac:	1.000
Matrix:	Soil	Batch#:	210184
Units:	mg/Kg	Received:	04/16/14
Basis:	as received	Prepared:	04/18/14

Field ID	Type	Lab ID	Result	RL	Sampled	Analyzed
B-1-0-0.5	SAMPLE	255670-013	5.2	0.24	04/15/14	04/22/14
B-2-0-0.5	SAMPLE	255670-015	3.3	0.26	04/15/14	04/22/14
B-3-0-0.5	SAMPLE	255670-016	11	0.27	04/15/14	04/22/14
B-4-0-0.5	SAMPLE	255670-018	17	0.25	04/14/14	04/22/14
B-5-0-0.5	SAMPLE	255670-019	16	0.23	04/14/14	04/22/14
B-6-0-0.5	SAMPLE	255670-021	23	0.27	04/14/14	04/22/14
B-7-0-0.5	SAMPLE	255670-022	49	0.24	04/14/14	04/22/14
B-8-0-0.5	SAMPLE	255670-023	47	0.24	04/14/14	04/22/14
B-10-0-0.5	SAMPLE	255670-026	13	0.27	04/15/14	04/22/14
B-11-0-0.5	SAMPLE	255670-027	18	0.26	04/15/14	04/22/14
B-12-0-0.5	SAMPLE	255670-028	12	0.24	04/15/14	04/22/14
	BLANK	QC736598	ND	0.25		04/18/14

ND= Not Detected
 RL= Reporting Limit

Batch QC Report

Arsenic			
Lab #:	255670	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3050B
Project#:	0084.001.001	Analysis:	EPA 6010B
Analyte:	Arsenic	Diln Fac:	1.000
Field ID:	ZZZZZZZZZZ	Batch#:	210184
MSS Lab ID:	255717-001	Sampled:	04/17/14
Matrix:	Soil	Received:	04/17/14
Units:	mg/Kg	Prepared:	04/18/14
Basis:	as received	Analyzed:	04/18/14

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim
BS	QC736599		50.00	52.09	104	80-120		
BSD	QC736600		50.00	51.83	104	80-120	1	20
MS	QC736601	1.732	53.19	54.65	99	72-120		
MSD	QC736602		45.45	48.31	102	72-120	3	30

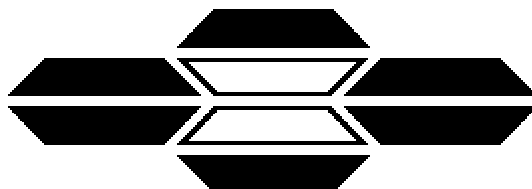
RPD= Relative Percent Difference

Batch QC Report

Lead			
Lab #:	255670	Location:	275 Elliott Drive
Client:	Terraphase Engineering	Prep:	EPA 3050B
Project#:	0084.001.001	Analysis:	EPA 6010B
Analyte:	Lead	Diln Fac:	1.000
Field ID:	ZZZZZZZZZZ	Batch#:	210184
MSS Lab ID:	255717-001	Sampled:	04/17/14
Matrix:	Soil	Received:	04/17/14
Units:	mg/Kg	Prepared:	04/18/14
Basis:	as received	Analyzed:	04/18/14

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim
BS	QC736599		100.0	102.8	103	80-120		
BSD	QC736600		100.0	102.8	103	80-120	0	20
MS	QC736601	1.722	106.4	101.1	93	52-122		
MSD	QC736602		90.91	87.83	95	52-122	1	49

RPD= Relative Percent Difference



ASBESTOS TEM LABORATORIES, INC.

**EPA Quantitative Bulk Test Method
Transmission Electron Microscopy
Analytical Report**

Laboratory Report # 326065

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ASBESTOS TEM LABORATORIES, INC

Jun/10/2014

Wendy Bellah

Terraphase Engineering Inc.
1404 Franklin St. Suite 500
Oakland, CA 94612

RE: LABORATORY REPORT #326065

Transmission electron microscopy analytical results for 6 bulk material sample(s).

Job Site: 275 Elliott Drive, Menlo Park CA

Job No.: 0084.001.001

Please find below the results for the TEM analysis of one or more bulk material samples. The analytical procedures were performed according to the EPA Test Method For the Determination of Asbestos in Bulk Building Materials - TEM method (EPA 600/R-93/116) modified for quantitative bulk soil sample analysis. Prior to analysis, each sample was logged-in and all pertinent data was recorded. Each sample was checked for damage and disruption of any chain-of-custody seals. A unique laboratory number was assigned to each sample. A hard copy Log-In sheet was generated. This, and all other relevant paper work was kept with the sample throughout the analytical procedures to assure proper analysis.

Sample preparation followed a standard CARB 435 prep method. The entire sample was dried at 135-150 C and then crushed to ~3/8" gravel size. If the submitted sample was >1 pint, the sample was split using a 1/2" riffle splitter following ASTM Method C-702-98 to obtain a 1 pint aliquot. The entire 1 pint aliquot, or entire original sample, was then pulverized in a Bico Braun disc pulverizer calibrated to produce a nominal 200 mesh final product. A representative ~100 mg aliquot of material was weighed out, and then placed into solution in a 500 ml beaker filled with distilled water. A known volume of the liquid suspension was filtered onto a 0.2 micron pore size Millipore mixed cellulose ester filter. The filter was then dried in HEPA filtered, Class 100 air on a clean bench. The filter was placed onto a glass microscope slide, sectioned, and collapsed in acetone. The collapsed filter was plasma-etched to remove 10% of the filter surface and then carbon coated. The carbon coated filter was sectioned and the sections placed onto 200-mesh copper TEM sample grids in dimethyl sulfoxide and acetone wick washers. After sufficient time to dissolve the filter material, the TEM sample grids were removed from the baths and placed into labeled sample containers.

TEM analysis was performed on a Philips CM-12 or JEOL 1200 transmission electron microscope operating at 80 or 100 kV. The sample was placed into the microscope where it was first scanned at low magnification to confirm that the distribution of material was reasonably homogeneous. High magnification analysis was performed using a two tier approach: 1) A relatively large area of several TEM grid openings for large asbestos fibers or fiber bundles, and 2) a relatively small area of a number of fields of view for individual asbestos fibers (fibrous particles exhibiting an aspect ratio greater than or equal to 3 to 1, and a length greater than or equal to .5 um). Detected asbestiform structures were subjected to detailed morphological and/or selected area diffraction analysis. If necessary, energy dispersive X-ray analysis was also performed. The length and width of each asbestos fiber was measured. From this data, a total volume and mass of asbestos observed in the scanned area is calculated, and extrapolated to a total weight percent asbestos for each sample.

Sincerely Yours,

Laboratory Manager

--- These results relate only to the samples tested and must not be reproduced, except in full, with the approval of the laboratory. This report must not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. ---

TRANSMISSION ELECTRON MICROSCOPY ANALYTICAL REPORT

Contact: Wendy Bellah
Address: Terraphase Engineering Inc.
1404 Franklin St. Suite 500
Oakland, CA 94612
Job Site / 275 Elliott Drive, Menlo Park CA
No. 0084.001.001

REPORT NO. **326065**

Date: Jun-10-14

Date Received: May-27-14

Total Samples Analyzed: 6

SAMPLE DESCRIPTION

Client Sample # **S-8Base**

Asphalt base rock

Laboratory Sample # **1436-00003-001**

SAMPLE PREPARATION PARAMETERS

Weight of Material Suspended (mg): 59.2

Filter Type & Pore Size MCE 0.22um

Volume of Suspension Water (ml): 500

Effective Filter Area (sq.mm) 346

Volume of Suspension Filtered (ml): 0.5

ASBESTOS DETECTED IN SCAN AREA

CHRYSOTILE		AMPHIBOLE	
FIBERS	BUNDLES	FIBERS	BUNDLES
NSD	NSD	NSD	NSD

CALCULATED ASBESTOS CONCENTRATION (WEIGHT %)

CHRYSOTILE	AMPHIBOLE	TOTAL
< 0.0001	< 0.0001	< 0.0001

COMMENTS

No Asbestos Detected

Filter Loading: Moderate


SAED Photo ID Nos.

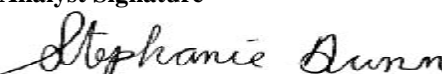
TEM / ANALYTICAL PARAMETERS

Grid Op. # Scanned For Large 20 Grid Area (sq.mm) 0.0098 Bundle Scan Area (sq.mm) 0.196
Fibers & Bundles
Grid Op. # Scanned For Small 3 Grid Area (sq.mm) 0.0098 Fiber Scan Area (sq.mm) 0.0294
Fibers & Bundles
Magnification: 15000

NOTATION KEY

Chrys. - Chrysotile Asbestos 1 um = 1 micron = 0.001 mm
Amph. - Amphibole Asbestos 1 mm = 1 millimeter
NSD - No Structures Detected 1 sq.mm = 1 square millimeter
Non-Asb. - Non-Asbestos 1 cc = 1 cubic centimeter


Analyst Signature


Lab QC Reviewer Signature

TRANSMISSION ELECTRON MICROSCOPY ANALYTICAL REPORT

Contact: Wendy Bellah
Address: Terraphase Engineering Inc.
1404 Franklin St. Suite 500
Oakland, CA 94612
Job Site / 275 Elliott Drive, Menlo Park CA
No. 0084.001.001

REPORT NO. **326065**

Date: Jun-10-14

Date Received: May-27-14

Total Samples Analyzed: 6

SAMPLE DESCRIPTION

Client Sample # **B-2Base**

Building base

Laboratory Sample # 1436-00003-002

SAMPLE PREPARATION PARAMETERS

Weight of Material Suspended (mg): 60

Filter Type & Pore Size MCE 0.22um

Volume of Suspension Water (ml): 500

Effective Filter Area (sq.mm) 346

Volume of Suspension Filtered (ml): 0.5

ASBESTOS DETECTED IN SCAN AREA

CHRYSOTILE		AMPHIBOLE	
FIBERS	BUNDLES	FIBERS	BUNDLES
NSD	NSD	NSD	NSD

CALCULATED ASBESTOS CONCENTRATION (WEIGHT %)

CHRYSOTILE	AMPHIBOLE	TOTAL
< 0.0001	< 0.0001	< 0.0001

COMMENTS

No Asbestos Detected

Filter Loading: Moderate

SAED Photo ID Nos.

TEM / ANALYTICAL PARAMETERS

Grid Op. # Scanned For Large 20 Grid Area (sq.mm) 0.0098 Bundle Scan Area (sq.mm) 0.196
Fibers & Bundles

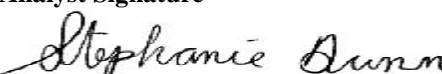
Grid Op. # Scanned For Small 3 Grid Area (sq.mm) 0.0098 Fiber Scan Area (sq.mm) 0.0294
Fibers & Bundles

Magnification: 15000

NOTATION KEY

Chrys. - Chrysotile Asbestos 1 um = 1 micron = 0.001 mm
Amph. - Amphibole Asbestos 1 mm = 1 millimeter
NSD - No Structures Detected 1 sq.mm = 1 square millimeter
Non-Asb. - Non-Asbestos 1 cc = 1 cubic centimeter


Analyst Signature


Lab QC Reviewer Signature

TRANSMISSION ELECTRON MICROSCOPY ANALYTICAL REPORT

Contact: Wendy Bellah
Address: Terraphase Engineering Inc.
1404 Franklin St. Suite 500
Oakland, CA 94612
Job Site / 275 Elliott Drive, Menlo Park CA
No. 0084.001.001

REPORT NO. **326065**

Date: Jun-10-14

Date Received: May-27-14

Total Samples Analyzed: 6

SAMPLE DESCRIPTION

Client Sample # **S-7Base**

Asphalt base

Laboratory Sample # **1436-00003-003**

SAMPLE PREPARATION PARAMETERS

Weight of Material Suspended (mg): 60.8

Filter Type & Pore Size MCE 0.22um

Volume of Suspension Water (ml): 500

Effective Filter Area (sq.mm) 346

Volume of Suspension Filtered (ml): 0.5

ASBESTOS DETECTED IN SCAN AREA

CHRYSOTILE		AMPHIBOLE	
FIBERS	BUNDLES	FIBERS	BUNDLES
17	NSD	4	NSD

CALCULATED ASBESTOS CONCENTRATION (WEIGHT %)

CHRYSOTILE	AMPHIBOLE	TOTAL
0.0209	0.0061	0.0270

COMMENTS

Chrysotile, Actinolite, and Glaucophane Detected

Filter Loading: Moderate

SAED Photo ID Nos.

TEM / ANALYTICAL PARAMETERS


Grid Op. # Scanned For Large 20 Grid Area (sq.mm) 0.0098 Bundle Scan Area (sq.mm) 0.196
Fibers & Bundles

Grid Op. # Scanned For Small 4 Grid Area (sq.mm) 0.0098 Fiber Scan Area (sq.mm) 0.0392
Fibers & Bundles

Magnification: 15000

NOTATION KEY

Chrys. - Chrysotile Asbestos 1 um = 1 micron = 0.001 mm
Amph. - Amphibole Asbestos 1 mm = 1 millimeter
NSD - No Structures Detected 1 sq.mm = 1 square millimeter
Non-Asb. - Non-Asbestos 1 cc = 1 cubic centimeter


Analyst Signature


Lab QC Reviewer Signature

TRANSMISSION ELECTRON MICROSCOPY ANALYTICAL REPORT

Contact: Wendy Bellah
Address: Terraphase Engineering Inc.
1404 Franklin St. Suite 500
Oakland, CA 94612
Job Site / No. 275 Elliott Drive, Menlo Park CA
0084.001.001

REPORT NO. **326065**

Date: Jun-10-14

Date Received: May-27-14

Total Samples Analyzed: 6

SAMPLE DESCRIPTION

Client Sample # **B-9Base**

Building base

Laboratory Sample # 1436-00003-004

SAMPLE PREPARATION PARAMETERS

Weight of Material Suspended (mg): 61.6

Filter Type & Pore Size MCE 0.22um

Volume of Suspension Water (ml): 500

Effective Filter Area (sq.mm) 346

Volume of Suspension Filtered (ml): 0.5

ASBESTOS DETECTED IN SCAN AREA

CHRYSTILE		AMPHIBOLE	
FIBERS	BUNDLES	FIBERS	BUNDLES
NSD	NSD	NSD	NSD

CALCULATED ASBESTOS CONCENTRATION (WEIGHT %)

CHRYSTILE	AMPHIBOLE	TOTAL
< 0.0001	< 0.0001	< 0.0001

COMMENTS

No Asbestos Detected

Filter Loading: Moderate

SAED Photo ID Nos.

TEM / ANALYTICAL PARAMETERS

Grid Op. # Scanned For Large Fibers & Bundles 20 Grid Area (sq.mm) 0.0098 Bundle Scan Area (sq.mm) 0.196
Grid Op. # Scanned For Small Fibers & Bundles 3 Grid Area (sq.mm) 0.0098 Fiber Scan Area (sq.mm) 0.0294
Magnification: 15000

NOTATION KEY

Chrys. - Chrysotile Asbestos 1 um = 1 micron = 0.001 mm
Amph. - Amphibole Asbestos 1 mm = 1 millimeter
NSD - No Structures Detected 1 sq.mm = 1 square millimeter
Non-Asb. - Non-Asbestos 1 cc = 1 cubic centimeter


Analyst Signature


Lab QC Reviewer Signature

TRANSMISSION ELECTRON MICROSCOPY ANALYTICAL REPORT

Contact: Wendy Bellah
Address: Terraphase Engineering Inc.
1404 Franklin St. Suite 500
Oakland, CA 94612
Job Site / 275 Elliott Drive, Menlo Park CA
No. 0084.001.001

REPORT NO. **326065**

Date: Jun-10-14

Date Received: May-27-14

Total Samples Analyzed: 6

SAMPLE DESCRIPTION

Client Sample # **B-1Base**

Building base

Laboratory Sample # 1436-00003-005

SAMPLE PREPARATION PARAMETERS

Weight of Material Suspended (mg): 63

Filter Type & Pore Size MCE 0.22um

Volume of Suspension Water (ml): 500

Effective Filter Area (sq.mm) 346

Volume of Suspension Filtered (ml): 0.5

ASBESTOS DETECTED IN SCAN AREA

CHRYSOTILE		AMPHIBOLE	
FIBERS	BUNDLES	FIBERS	BUNDLES
NSD	NSD	6	NSD

CALCULATED ASBESTOS CONCENTRATION (WEIGHT %)

CHRYSOTILE	AMPHIBOLE	TOTAL
< 0.0001	0.0548	0.0548

COMMENTS

Actinolite Asbestos Detected

Filter Loading: Moderate

SAED Photo ID Nos.

TEM / ANALYTICAL PARAMETERS


Grid Op. # Scanned For Large 20 Grid Area (sq.mm) 0.0098 Bundle Scan Area (sq.mm) 0.196
Fibers & Bundles

Grid Op. # Scanned For Small 4 Grid Area (sq.mm) 0.0098 Fiber Scan Area (sq.mm) 0.0392
Fibers & Bundles

Magnification: 15000

NOTATION KEY

Chrys. - Chrysotile Asbestos 1 um = 1 micron = 0.001 mm
Amph. - Amphibole Asbestos 1 mm = 1 millimeter
NSD - No Structures Detected 1 sq.mm = 1 square millimeter
Non-Asb. - Non-Asbestos 1 cc = 1 cubic centimeter


Analyst Signature


Lab QC Reviewer Signature

TRANSMISSION ELECTRON MICROSCOPY ANALYTICAL REPORT

Contact: Wendy Bellah
Address: Terraphase Engineering Inc.
1404 Franklin St. Suite 500
Oakland, CA 94612
Job Site / 275 Elliott Drive, Menlo Park CA
No. 0084.001.001

REPORT NO. **326065**

Date: Jun-10-14

Date Received: May-27-14

Total Samples Analyzed: 6

SAMPLE DESCRIPTION

Client Sample # **S-11Base**

Asphalt base

Laboratory Sample # **1436-00003-006**

SAMPLE PREPARATION PARAMETERS

Weight of Material Suspended (mg): 60.8

Filter Type & Pore Size MCE 0.22um

Volume of Suspension Water (ml): 500

Effective Filter Area (sq.mm) 346

Volume of Suspension Filtered (ml): 0.5

ASBESTOS DETECTED IN SCAN AREA

CHRYSOTILE		AMPHIBOLE	
FIBERS	BUNDLES	FIBERS	BUNDLES
NSD	NSD	6	NSD

CALCULATED ASBESTOS CONCENTRATION (WEIGHT %)

CHRYSOTILE	AMPHIBOLE	TOTAL
< 0.0001	0.0065	0.0065

COMMENTS

Actinolite Asbestos Detected

Filter Loading: Moderate

SAED Photo ID Nos.

TEM / ANALYTICAL PARAMETERS


Grid Op. # Scanned For Large 20 Grid Area (sq.mm) 0.0098 Bundle Scan Area (sq.mm) 0.196
Fibers & Bundles

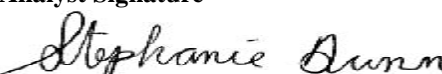
Grid Op. # Scanned For Small 3 Grid Area (sq.mm) 0.0098 Fiber Scan Area (sq.mm) 0.0294
Fibers & Bundles

Magnification: 15000

NOTATION KEY

Chrys. - Chrysotile Asbestos 1 um = 1 micron = 0.001 mm
Amph. - Amphibole Asbestos 1 mm = 1 millimeter
NSD - No Structures Detected 1 sq.mm = 1 square millimeter
Non-Asb. - Non-Asbestos 1 cc = 1 cubic centimeter


Analyst Signature


Lab QC Reviewer Signature

ANALYTICAL CHANGE ORDER REQUEST FORM



ENVIRONMENTAL LABORATORIES, INC.
 1409 Franklin St., Suite 600
 Oakland, CA 94612

TEL: 415-34-0368
 FAX: 415-34-0368

Terraplane Engineering Inc.
 1409 Franklin St., Suite 600
 Oakland, CA 94612
 Wendy Bellah

TEM/10-day
 Menlo Park
 0084.001.001
 415 34-0368 510-380-6304

Rn/s of PCM CARB 435 325417
 Samples 2, 3, 4, 5, 7, 8

SAMPLE ID NUMBER	SAMPLE TYPE	ANALYSIS TYPE	Location - Description
2 S-S Base	soil/subbase	TEM EPA Quant	Asphalt base rock
3 B-2 Base	soil/subbase	TEM EPA Quant	Building base
4 S-7 Base	soil/subbase	TEM EPA Quant	Asphalt base
5 B-9 Base	soil/subbase	TEM EPA Quant	building base
7 B-1 Base	soil/subbase	TEM EPA Quant	Building base
8 S-11 Base	soil/subbase	TEM EPA Quant	asphalt base

SIGNATURE OF SUBMITTER

Authorized by: Wendy Bellah, Terraplane Date: 5/19/04 Time: 6:57 AM

ASBESTOS TEM LABORATORIES CHAIN OF CUSTODY - www.asbestostemplabs.com

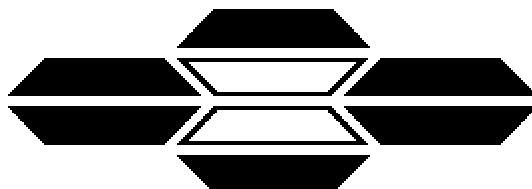
CALIFORNIA: 630 Bancroft Way, Berkeley, CA 94710 Phone (510) 704-8930 Fax (510) 704-8429

NEVADA: 1350 Freeport Blvd. #104, Sparks, NV 89431 Phone (775) 359-3377 Fax (775) 359-2798

Please print and send completed CoC with your samples. If you wish to email CoC, send the form as an attachment to Berkeley <coc@asbestostemplabs.com> or Reno <sehrlich@asbestostemplabs.com>.

Company: Terraphase Engineering Inc.		Contact: Wendy Bellah		Phone/Fax: (415) 314-0368		Email: wendy.bellah@terrphase.com					
Address: 1404 Franklin St, Ste 600		City: Oakland		State: CA Zip: 94546		Country: United States					
Job Site: 275 Elliott Drive, Menlo Park				Job No: 0084.001.001		P.O. No:					
Reporting	<input type="checkbox"/> Fax	<input type="checkbox"/> Phone	<input type="checkbox"/> Email	<input type="checkbox"/> Mail	<input type="checkbox"/> FTP	<input type="checkbox"/> EDD/State Form	<input type="checkbox"/> Verbal				
	<input type="checkbox"/> Pickup	Billing		<input type="checkbox"/> Fax	<input type="checkbox"/> Email	<input type="checkbox"/> Mail	<input type="checkbox"/> Pre-Paid <input type="checkbox"/> 3 rd Party				
Results Due:	<input type="checkbox"/> 2 hr	<input type="checkbox"/> 4 hr	<input type="checkbox"/> 6 hr	<input type="checkbox"/> 8 hr	<input type="checkbox"/> 24 hr	<input type="checkbox"/> 48 hr	<input type="checkbox"/> 3 day <input type="checkbox"/> 4 day <input type="checkbox"/> 5 day <input type="checkbox"/> 10 day				
	Time due: _____						* Contact lab to confirm TAT				
Asbestos Air	<input type="checkbox"/> PCM (NIOSH 7400A)	<input type="checkbox"/> TEM AHERA	<input type="checkbox"/> TEM CARB Mod. AHERA	<input type="checkbox"/> TEM EPA Yamate Level	<input type="checkbox"/> TEM NIOSH 7402, Issue 2	<input type="checkbox"/> ISO 10312	<input type="checkbox"/> ISO 13794				
Asbestos Bulk	<input type="checkbox"/> PLM Standard (EPA 600/R-93-1)	<input type="checkbox"/> PLM 400 PC	<input type="checkbox"/> PLM 1000 PC	<input type="checkbox"/> PLM 400 PC Grav. Red.	<input type="checkbox"/> PLM 1000 PC Grav. Red.	<input type="checkbox"/> TEM EPA Qualitative	<input type="checkbox"/> TEM EPA Quantitative				
	<input type="checkbox"/> TEM Chatfield (Semi-Quant)	<input type="checkbox"/> PLM Vermiculite Attic Insulation	<input type="checkbox"/> Custom Analysis: Type: _____								
Asbestos Soils	<input type="checkbox"/> CARB 435 Prep Only	<input checked="" type="checkbox"/> CARB 435 PLM 400 PC	<input type="checkbox"/> CARB 435 PLM 1000 PC	<input type="checkbox"/> EPA Soil Screening Qualitative	<input type="checkbox"/> TEM EPA/CARB Quantitative						
Asbestos Dust	<input type="checkbox"/> ASTM D-5755 Fiber Count	<input type="checkbox"/> ASTM D-5756 Wt. %	<input type="checkbox"/> ASTM D-5756 Mass	<input type="checkbox"/> ASTM D-6840-99 Dust Wipe	<input type="checkbox"/> Total Particulates (Grav.)						
Asbestos Water	<input type="checkbox"/> 100.2 Potable Drinking Water	<input type="checkbox"/> 100.1 Non Potable Water									
Lead	<input type="checkbox"/> Paint Chips	<input type="checkbox"/> Dust Wipe	<input type="checkbox"/> Air Cassette	<input type="checkbox"/> Soil	Lead Waste Characterization:		<input type="checkbox"/> TTLC <input type="checkbox"/> STLC <input type="checkbox"/> TCLP				
Sample Storage	<input type="checkbox"/> No Test, Hold Sample Until: _____ <input type="checkbox"/> Post Test, Hold Sample Until: _____										
Custom Order	<input type="checkbox"/> Reanalysis by: _____ <input type="checkbox"/> Sensitivity: _____ <input type="checkbox"/> Composite <input type="checkbox"/> Other: _____										
Sample #	Sample Type	Date Collected	Time On	Time Off	Total Time (min)	Flow Rate (lpm)			Volume or Area Sampled	8 Hour TWA Requested	Description
						On	Off	Average			
S-12 Base	Soil/Subbase	4/15/14								<input type="checkbox"/>	Please retain samples. Asphalt base rock
S-8 Base	Soil/Subbase	4/15/14								<input type="checkbox"/>	Asphalt base rock black top
B-2 Base	Soil/Subbase	4/15/14								<input type="checkbox"/>	Baselock building
S-7 Base	Soil/Subbase	4/15/14								<input type="checkbox"/>	Asphalt base rock
B-9 Base	Soil/Subbase	4/15/14								<input type="checkbox"/>	Baselock building
B-3 Base	Soil/Subbase	4/15/14								<input type="checkbox"/>	Baselock building
B-1 Base	Soil/Subbase	4/15/14								<input type="checkbox"/>	Baselock building
S-11 Base	Soil/Subbase	4/15/14								<input type="checkbox"/>	Asphalt base rock parking lot
										<input type="checkbox"/>	
										<input type="checkbox"/>	
										<input type="checkbox"/>	* Please retain all samples for potential TEM analyses. *
										<input type="checkbox"/>	
Submitted By <i>Chris</i>		Received By <i>Wendy Bellah</i>									
Date/Time Submitted 4/17/14 11:13		Date/Time Received 4/17/14 11:13									
Submitted By <i>Wendy Bellah</i>		Received By <i>ATEM/RT</i>									
Date/Time Submitted 04-17-14 P02:33 IN		Date/Time Received 04-17-14 P02:32 IN									

*All samples will be held for 3 months from the date of receipt at ATEM. Additional sample storage time may be obtained through ATEM Customer Service



ASBESTOS TEM LABORATORIES, INC.

EPA Quantitative Bulk Test Method Transmission Electron Microscopy Analytical Report

Laboratory Report # 325896

630 Bancroft Way
Berkeley, CA 94710
(510) 704-8930
FAX (510) 704-8429
www.asbestostemplabs.com



ASBESTOS TEM LABORATORIES, INC

May/16/2014

Wendy Bellah

Terraphase Engineering Inc.
1404 Franklin St. Suite 500
Oakland, CA 94612

RE: LABORATORY REPORT #325896

Transmission electron microscopy analytical results for 2 bulk material sample(s).

Job Site: Menlo Park

Job No.: 0084.001.001

Please find below the results for the TEM analysis of one or more bulk material samples. The analytical procedures were performed according to the EPA Test Method For the Determination of Asbestos in Bulk Building Materials - TEM method (EPA 600/R-93/116) modified for quantitative bulk soil sample analysis. Prior to analysis, each sample was logged-in and all pertinent data was recorded. Each sample was checked for damage and disruption of any chain-of-custody seals. A unique laboratory number was assigned to each sample. A hard copy Log-In sheet was generated. This, and all other relevant paper work was kept with the sample throughout the analytical procedures to assure proper analysis.

Sample preparation followed a standard CARB 435 prep method. The entire sample was dried at 135-150 C and then crushed to ~3/8" gravel size. If the submitted sample was >1 pint, the sample was split using a 1/2" riffle splitter following ASTM Method C-702-98 to obtain a 1 pint aliquot. The entire 1 pint aliquot, or entire original sample, was then pulverized in a Bico Braun disc pulverizer calibrated to produce a nominal 200 mesh final product. A representative ~100 mg aliquot of material was weighed out, and then placed into solution in a 500 ml beaker filled with distilled water. A known volume of the liquid suspension was filtered onto a 0.2 micron pore size Millipore mixed cellulose ester filter. The filter was then dried in HEPA filtered, Class 100 air on a clean bench. The filter was placed onto a glass microscope slide, sectioned, and collapsed in acetone. The collapsed filter was plasma-etched to remove 10% of the filter surface and then carbon coated. The carbon coated filter was sectioned and the sections placed onto 200-mesh copper TEM sample grids in dimethyl sulfoxide and acetone wick washers. After sufficient time to dissolve the filter material, the TEM sample grids were removed from the baths and placed into labeled sample containers.

TEM analysis was performed on a Philips CM-12 or JEOL 1200 transmission electron microscope operating at 80 or 100 kV. The sample was placed into the microscope where it was first scanned at low magnification to confirm that the distribution of material was reasonably homogeneous. High magnification analysis was performed using a two tier approach: 1) A relatively large area of several TEM grid openings for large asbestos fibers or fiber bundles, and 2) a relatively small area of a number of fields of view for individual asbestos fibers (fibrous particles exhibiting an aspect ratio greater than or equal to 3 to 1, and a length greater than or equal to .5 um). Detected asbestiform structures were subjected to detailed morphological and/or selected area diffraction analysis. If necessary, energy dispersive X-ray analysis was also performed. The length and width of each asbestos fiber was measured. From this data, a total volume and mass of asbestos observed in the scanned area is calculated, and extrapolated to a total weight percent asbestos for each sample.

Laboratory Manager

--- These results relate only to the samples tested and must not be reproduced, except in full, with the approval of the laboratory. This report must not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. ---

TRANSMISSION ELECTRON MICROSCOPY ANALYTICAL REPORT

Contact: Wendy Bellah

REPORT NO. **325896**

Address: Terraphase Engineering Inc.
1404 Franklin St. Suite 500
Oakland, CA 94612

Date: May-16-14

Date Received: May-01-14

Job Site /
No. 0084.001.001

Total Samples Analyzed: 2

SAMPLE DESCRIPTION

Client Sample # **S-12 Base**

Asphalt baserock - parking lot

Laboratory Sample # 1436-00002-001

SAMPLE PREPARATION PARAMETERS

Weight of Material Suspended (mg): 61.4

Filter Type & Pore Size MCE 0.22um

Volume of Suspension Water (ml): 500

Effective Filter Area (sq.mm) 346

Volume of Suspension Filtered (ml): 0.5

ASBESTOS DETECTED IN SCAN AREA

CHRYSOTILE		AMPHIBOLE	
FIBERS	BUNDLES	FIBERS	BUNDLES
NSD	NSD	8	NSD

CALCULATED ASBESTOS CONCENTRATION (WEIGHT %)

CHRYSOTILE	AMPHIBOLE	TOTAL
< 0.0001	0.07885	0.07885

COMMENTS

5 Actinolite and 3 Hornblende Detected.

Filter Loading: Moderate

SAED Photo ID Nos.

TEM / ANALYTICAL PARAMETERS

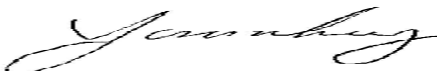
Grid Op. # Scanned For Large 20 Grid Area (sq.mm) 0.0098 Bundle Scan Area (sq.mm) 0.196
Fibers & Bundles

Grid Op. # Scanned For Small 5 Grid Area (sq.mm) 0.0098 Fiber Scan Area (sq.mm) 0.049
Fibers & Bundles

Magnification: 15000

NOTATION KEY

Chrys. - Chrysotile Asbestos 1 um = 1 micron = 0.001 mm
Amph. - Amphibole Asbestos 1 mm = 1 millimeter
NSD - No Structures Detected 1 sq.mm = 1 square millimeter
Non-Asb. - Non-Asbestos 1 cc = 1 cubic centimeter


Analyst Signature


Lab QC Reviewer Signature

TRANSMISSION ELECTRON MICROSCOPY ANALYTICAL REPORT

Contact: Wendy Bellah
Address: Terraphase Engineering Inc.
1404 Franklin St. Suite 500
Oakland, CA 94612
Job Site / Menlo Park
No. 0084.001.001

REPORT NO. **325896**

Date: May-16-14

Date Received: May-01-14

Total Samples Analyzed: 2

SAMPLE DESCRIPTION

Client Sample # **B-3 Base**

Baseroack building

Laboratory Sample # 1436-00002-002

SAMPLE PREPARATION PARAMETERS

Weight of Material Suspended (mg): 62.9

Filter Type & Pore Size MCE 0.22um

Volume of Suspension Water (ml): 500

Effective Filter Area (sq.mm) 346

Volume of Suspension Filtered (ml): 0.5

ASBESTOS DETECTED IN SCAN AREA

CHRYSTOTILE		AMPHIBOLE	
FIBERS	BUNDLES	FIBERS	BUNDLES
NSD	NSD	2	NSD

CALCULATED ASBESTOS CONCENTRATION (WEIGHT %)

CHRYSTOTILE	AMPHIBOLE	TOTAL
< 0.0001	0.00725	0.00725

COMMENTS

Actinolite and Winchite Detected

Filter Loading: Moderate

SAED Photo ID Nos.

TEM / ANALYTICAL PARAMETERS

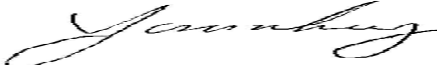
Grid Op. # Scanned For Large 20 Grid Area (sq.mm) 0.0098 Bundle Scan Area (sq.mm) 0.196
Fibers & Bundles

Grid Op. # Scanned For Small 5 Grid Area (sq.mm) 0.0098 Fiber Scan Area (sq.mm) 0.049
Fibers & Bundles

Magnification: 15000

NOTATION KEY

Chrys. - Chrysotile Asbestos 1 um = 1 micron = 0.001 mm
Amph. - Amphibole Asbestos 1 mm = 1 millimeter
NSD - No Structures Detected 1 sq.mm = 1 square millimeter
Non-Asb. - Non-Asbestos 1 cc = 1 cubic centimeter


Analyst Signature


Lab QC Reviewer Signature

Ph: (510) 704-8930
Fax: (510) 704-8429

Analysis Requested/Turnaround: TEM/10-day

Job Site: Menlo Park

Job No: 0084.001.001 P.O. #: _____

Phone: 415-314-0368 FAX: 510-380-6304

Special Instructions: Reanalysis from PM-CAL AB 435 400 p.c.t
328A17

[illegible]

Authorized by: Wendy Bellah Terraphase Date: 5/1/14 Time: 1:08PM

ASBESTOS TEM LABORATORIES CHAIN OF CUSTODY – www.asbestostemplabs.com

CALIFORNIA: 630 Bancroft Way, Berkeley, CA 94710

Phone (510) 704-8930 Fax (510) 704-8429

NEVADA: 1350 Freeport Blvd. #104, Sparks, NV 89431

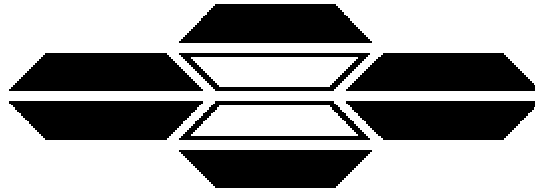
Phone (775) 359-3377 Fax (775) 359-2798

Please print and send completed CoC with your samples. If you wish to email CoC, send the form as an attachment to Berkeley <coc@asbestostemplabs.com> or Reno <sehrlich@asbestostemplabs.com>.

Company: Terraphase Engineering Inc.				Contact: Wendy Bellah				Phone/Fax: (415) 314-0368				Email: wendy.bellah@terraphase.com			
Address: 1404 Franklin St, Ste 600				City: Oakland				State: CA Zip: 94546				Country: United States			
Job Site: 275 Elliott Drive, Menlo Park								Job No: 0084.001.001				P.O. No:			
Reporting	<input type="checkbox"/> Fax	<input type="checkbox"/> Phone	<input checked="" type="checkbox"/> Email	<input type="checkbox"/> Mail	<input type="checkbox"/> FTP	<input type="checkbox"/> EDD/State Form	<input type="checkbox"/> Verbal	<input type="checkbox"/> Pickup	Billing	<input type="checkbox"/> Fax	<input checked="" type="checkbox"/> Email	<input type="checkbox"/> Mail	<input type="checkbox"/> Pre-Paid	<input type="checkbox"/> 3 rd Party	
Results Due:	<input type="checkbox"/> 2 hr <input type="checkbox"/> 4 hr <input type="checkbox"/> 6 hr <input type="checkbox"/> 8 hr <input type="checkbox"/> 24 hr <input type="checkbox"/> 48 hr <input type="checkbox"/> 3 day <input type="checkbox"/> 4 day <input type="checkbox"/> 5 day <input checked="" type="checkbox"/> 10 day <input type="checkbox"/> Time due: _____ * Contact lab to confirm TAT														
Asbestos Air	<input type="checkbox"/> PCM (NIOSH 7400A) <input type="checkbox"/> TEM AHRA <input type="checkbox"/> TEM CARB Mod. AHRA <input type="checkbox"/> TEM EPA Yamate Level <input type="checkbox"/> TEM NIOSH 7402, Issue 2 <input type="checkbox"/> ISO 10312 <input type="checkbox"/> ISO 13794														
Asbestos Bulk	<input type="checkbox"/> PLM Standard (EPA 600/R-93-1) <input type="checkbox"/> PLM 400 PC <input type="checkbox"/> PLM 1000 PC <input type="checkbox"/> PLM 400 PC Grav. Red. <input type="checkbox"/> PLM 1000 PC Grav. Red. <input type="checkbox"/> TEM EPA Qualitative <input type="checkbox"/> TEM EPA Quantitative														
	<input type="checkbox"/> TEM Chatfield (Semi-Quant) <input type="checkbox"/> PLM Vermiculite Attic Insulation <input type="checkbox"/> Custom Analysis: Type: _____														
Asbestos Soils	<input type="checkbox"/> CARB 435 Prep Only <input checked="" type="checkbox"/> CARB 435 PLM 400 PC <input type="checkbox"/> CARB 435 PLM 1000 PC <input type="checkbox"/> EPA Soil Screening Qualitative <input type="checkbox"/> TEM EPA/CARB Quantitative														
Asbestos Dust	<input type="checkbox"/> ASTM D-5755 Fiber Count <input type="checkbox"/> ASTM D-5756 Wt. % <input type="checkbox"/> ASTM D-5756 Mass <input type="checkbox"/> ASTM D-6840-99 Dust Wipe <input type="checkbox"/> Total Particulates (Grav.)														
Asbestos Water	<input type="checkbox"/> 100.2 Potable Drinking Water <input type="checkbox"/> 100.1 Non Potable Water														
Lead	<input type="checkbox"/> Paint Chips <input type="checkbox"/> Dust Wipe <input type="checkbox"/> Air Cassette <input type="checkbox"/> Soil				Lead Waste Characterization:				<input type="checkbox"/> TTLC <input type="checkbox"/> STLC <input type="checkbox"/> TCLP						
Sample Storage	<input checked="" type="checkbox"/> No Test, Hold Sample Until: _____ <input type="checkbox"/> Post Test, Hold Sample Until: _____														
Custom Order	<input type="checkbox"/> Reanalysis by: _____ <input type="checkbox"/> Sensitivity: _____ <input type="checkbox"/> Composite <input type="checkbox"/> Other: _____														
Sample #	Sample Type	Date Collected	Time On	Time Off	Total Time (min)	Flow Rate (lpm)			Volume or Area Sampled	8 Hour TWA Requested	Description				
						On	Off	Average							
S-12 Base	Soil/Subbase	4/15/14								<input type="checkbox"/>	Plaza retain samples. Asphalt base rock parking lot				
S-8 Base	Soil/Subbase	4/15/14								<input type="checkbox"/>	Asphalt base rock black top				
B-2 Base	Soil/Subbase	4/15/14								<input type="checkbox"/>	Basement building				
S-7 Base	Soil/Subbase	4/15/14								<input type="checkbox"/>	Asphalt base rock				
B-9 Base	Soil/Subbase	4/15/14								<input type="checkbox"/>	Basement building				
B-3 Base	Soil/Subbase	4/15/14								<input type="checkbox"/>	Basement building				
B-1 Base	Soil/Subbase	4/15/14								<input type="checkbox"/>	Basement building				
S-11 Base	Soil/Subbase	4/15/14								<input type="checkbox"/>	Asphalt base rock parking lot				
										<input type="checkbox"/>					
										<input type="checkbox"/>					
										<input type="checkbox"/>	*Please retain all samples for potential TEM analyses. *				
										<input type="checkbox"/>					
										<input type="checkbox"/>					

Submitted By <i>Chad Jones</i>	Received By <i>Wendy Bellah</i>
Date/Time Submitted 4/17/14 11:13	Date/Time Received 4/17/14 11:13
Submitted By <i>Wendy Bellah</i>	Received By <i>ATEM/RT</i>
Date/Time Submitted 04-17-14 02:33 IN	Date/Time Received 04-17-14 02:32 IN

*All samples will be held for 3 months from the date of receipt at ATEM. Additional sample storage time may be obtained through ATEM Customer Service



ASBESTOS TEM LABORATORIES, INC.

CARB Method 435 Polarized Light Microscopy Analytical Report

Laboratory Job # 1436-00001

630 Bancroft Way
Berkeley, CA 94710
(510) 704-8930
FAX (510) 704-8429



ASBESTOS TEM LABORATORIES, INC

CA DPH ELAP
Lab No. 1866



NVLAP Lab Code: 101891-0
Berkeley, CA

May/01/2014

Wendy Bellah
Terraphase Engineering Inc.
1404 Franklin St. Suite 500
Oakland, CA 94612

RE: LABORATORY JOB # 1436-00001

Polarized light microscopy analytical results for 8 bulk sample(s).

Job Site: 0084.001.001

Job No.: 275 Elliott Drive, Menlo Park CA

Enclosed please find the bulk material analytical results for one or more samples submitted for asbestos analysis. The analyses were performed in accordance with the California Air Resources Board (ARB) Method 435 for the determination of asbestos in serpentine aggregate samples.

Prior to analysis, samples are logged-in and all data pertinent to the sample recorded. The samples are checked for damage or disruption of any chain-of-custody seals. A unique laboratory ID number is assigned to each sample. A hard copy log-in sheet containing all pertinent information concerning the sample is generated. This and all other relevant paper work are kept with the sample throughout the analytical procedures to assure proper analysis.

Sample preparation follows a standard CARB 435 prep method. The entire sample is dried at 135-150 C and then crushed to ~3/8" gravel size using a Bico Chipmunk crusher. If the submitted sample is >1 pint, the sample was split using a 1/2" riffle splitter following ASTM Method C-702-98 to obtain a 1 pint aliquot. The entire 1 pint aliquot, or entire original sample, is then pulverized in a Bico Braun disc pulverizer calibrated to produce a nominal 200 mesh final product. If necessary, additional homogenization steps are undertaken using a 3/8" riffle splitter. Small aliquots are collected from throughout the pulverized material to create three separate microscope slide mounts containing the appropriate refractive index oil. The prepared slides are placed under a polarizing light microscope where standard mineralogical techniques are used to analyze the various materials present, including asbestos. If asbestos is identified and of less than 10% concentration by visual area estimate then an additional five sample mounts are prepared. Quantification of asbestos concentration is obtained using the standard CAL ARB Method 435 point count protocol. For samples observed to contain visible asbestos of less than 10% concentration, a point counting technique is used with 50 points counted on each of eight sample mounts for a total of 400 points. The data is then compiled into standard report format and subjected to a thorough quality assurance check before the information is released to the client.

While the CARB 435 method has much to commend it, there are a number of situations where it fails to provide sufficient accuracy to make a definitive determination of the presence/absence of asbestos and/or an accurate count of the asbestos concentration present in a given sample. These problems include, but are not limited to, 1) statistical uncertainty with samples containing <1% asbestos when too few particles are counted, 2) definitive identification and discrimination between various fibrous amphibole minerals such as tremolite/actinolite/hornblende and the "Libby amphiboles" such as tremolite/winchite/richterite/arfvedsonite, and C) small asbestiform fibers which are near or below the resolution limit of the PLM microscope such as those found in various California coast range serpentine bodies. In these cases, further analysis by transmission electron microscopy is recommended to obtain a more accurate result.

Sincerely Yours,

Lab Manager
ASBESTOS TEM LABORATORIES, INC.

--- These results relate only to the samples tested and must not be reproduced, except in full, without the approval of the laboratory. ---

630 BANCROFT WAY • BERKELEY, CA 94710 • PH. (510) 704-8930 • FAX (510) 704-8429

With Branch Offices Located At: 1350 FREEPORT BLVD. UNIT 104, SPARKS, NV 89431

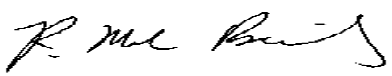
POLARIZED LIGHT MICROSCOPY

CARB 435 ANALYTICAL REPORT

Page: 1 of 1

Contact: Wendy Bellah Address: Terraphase Engineering Inc. 1404 Franklin St. Suite 500 Oakland, CA 94612	Samples Submitted: 8 Samples Analyzed: 8 Job Site / No. 275 Elliott Drive, Menlo Park CA 0084.001.001	Report No. 325417 Date Submitted: Apr-17-14 Date Reported: May-01-14
---	--	---

SAMPLE ID	ASBESTOS		LOCATION / DESCRIPTION
	POINTS COUNTED	% TYPE	
S-12 Base Lab ID # 1436-00001-001		<0.25% None Detected	Asphalt base rock, parking lot
	400 - Total Points		No Asbestos Detected - No Point Count Performed - ARB Exception I
S-8 Base Lab ID # 1436-00001-002		<0.25% None Detected	Asphalt base rock, black top
	400 - Total Points		No Asbestos Detected - No Point Count Performed - ARB Exception I
B-2 Base Lab ID # 1436-00001-003		<0.25% None Detected	Baseroack building
	400 - Total Points		No Asbestos Detected - No Point Count Performed - ARB Exception I
S-7 Base Lab ID # 1436-00001-004		<0.25% None Detected	Asphalt base rock
	400 - Total Points		No Asbestos Detected - No Point Count Performed - ARB Exception I
B-9 Base Lab ID # 1436-00001-005		<0.25% None Detected	Baseroack building
	400 - Total Points		No Asbestos Detected - No Point Count Performed - ARB Exception I
B-3 Base Lab ID # 1436-00001-006		<0.25% None Detected	Baseroack building
	400 - Total Points		No Asbestos Detected - No Point Count Performed - ARB Exception I
B-1 Base Lab ID # 1436-00001-007		<0.25% None Detected	Baseroack building
	400 - Total Points		No Asbestos Detected - No Point Count Performed - ARB Exception I
S-11 Base Lab ID # 1436-00001-008		<0.25% None Detected	Asphalt base rock parking lot
	400 - Total Points		No Asbestos Detected - No Point Count Performed - ARB Exception I
Lab ID #			
	- Total Points		
Lab ID #			
	- Total Points		

QC Reviewer 

Analyst 

ASBESTOS TEM LABORATORIES CHAIN OF CUSTODY - www.asbestostemplabs.com

CALIFORNIA: 630 Bancroft Way, Berkeley, CA 94710 Phone (510) 704-8930 Fax (510) 704-8429

NEVADA: 1350 Freeport Blvd. #104, Sparks, NV 89431 Phone (775) 359-3377 Fax (775) 359-2798

Please print and send completed CoC with your samples. If you wish to email CoC, send the form as an attachment to Berkeley <coc@asbestostemplabs.com> or Reno <sehrlich@asbestostemplabs.com>.

Company: Terraphase Engineering Inc.			Contact: Wendy Bellah			Phone/Fax: (415) 314-0368			Email: wendy.bellah@terraphase.com					
Address: 1404 Franklin St, Ste 600			City: Oakland			State: CA Zip: 94546			Country: United States					
Job Site: 275 Elliott Drive, Menlo Park						Job No: 0084.001.001			P.O. No:					
Reporting	<input type="checkbox"/> Fax	<input type="checkbox"/> Phone	<input type="checkbox"/> Email	<input type="checkbox"/> Mail	<input type="checkbox"/> FTP	<input type="checkbox"/> EDD/State Form	<input type="checkbox"/> Verbal	<input type="checkbox"/> Pickup	Billing	<input type="checkbox"/> Fax	<input type="checkbox"/> Email	<input type="checkbox"/> Mail	<input type="checkbox"/> Pre-Paid	<input type="checkbox"/> 3 rd Party
Results Due:*	<input type="checkbox"/> 2 hr <input type="checkbox"/> 4 hr <input type="checkbox"/> 6 hr <input type="checkbox"/> 8 hr <input type="checkbox"/> 24 hr <input type="checkbox"/> 48 hr <input type="checkbox"/> 3 day <input type="checkbox"/> 4 day <input type="checkbox"/> 5 day <input type="checkbox"/> 10 day <input type="checkbox"/> Time due: _____ * Contact lab to confirm TAT													
Asbestos Air	<input type="checkbox"/> PCM (NIOSH 7400A) <input type="checkbox"/> TEM AHERA <input type="checkbox"/> TEM CARB Mod. AHERA <input type="checkbox"/> TEM EPA Yamate Level <input type="checkbox"/> TEM NIOSH 7402, Issue 2 <input type="checkbox"/> ISO 10312 <input type="checkbox"/> ISO 13794													
Asbestos Bulk	<input type="checkbox"/> PLM Standard (EPA 600/R-93-1) <input type="checkbox"/> PLM 400 PC <input type="checkbox"/> PLM 1000 PC <input type="checkbox"/> PLM 400 PC Grav. Red. <input type="checkbox"/> PLM 1000 PC Grav. Red. <input type="checkbox"/> TEM EPA Qualitative <input type="checkbox"/> TEM EPA Quantitative													
	<input type="checkbox"/> TEM Chatfield (Semi-Quant) <input type="checkbox"/> PLM Vermiculite Attic Insulation <input type="checkbox"/> Custom Analysis: Type: _____													
Asbestos Soils	<input type="checkbox"/> CARB 435 Prep Only <input checked="" type="checkbox"/> CARB 435 PLM 400 PC <input type="checkbox"/> CARB 435 PLM 1000 PC <input type="checkbox"/> EPA Soil Screening Qualitative <input type="checkbox"/> TEM EPA/CARB Quantitative													
Asbestos Dust	<input type="checkbox"/> ASTM D-5755 Fiber Count <input type="checkbox"/> ASTM D-5756 Wt. % <input type="checkbox"/> ASTM D-5756 Mass <input type="checkbox"/> ASTM D-6840-99 Dust Wipe <input type="checkbox"/> Total Particulates (Grav.)													
Asbestos Water	<input type="checkbox"/> 100.2 Potable Drinking Water <input type="checkbox"/> 100.1 Non Potable Water													
Lead	<input type="checkbox"/> Paint Chips <input type="checkbox"/> Dust Wipe <input type="checkbox"/> Air Cassette <input type="checkbox"/> Soil <input type="checkbox"/> Lead Waste Characterization: <input type="checkbox"/> TTLC <input type="checkbox"/> STLC <input type="checkbox"/> TCLP													
Sample Storage	<input type="checkbox"/> No Test, Hold Sample Until: _____ <input type="checkbox"/> Post Test, Hold Sample Until: _____													
Custom Order	<input type="checkbox"/> Reanalysis by: _____ <input type="checkbox"/> Sensitivity: _____ <input type="checkbox"/> Composite <input type="checkbox"/> Other: _____													
Sample #	Sample Type	Date Collected	Time On	Time Off	Total Time (min)	Flow Rate (lpm)			Volume or Area Sampled	8 Hour TWA Requested	Description			
						On	Off	Average						
S-12 Base	Soil/Subbase	4/15/14								<input type="checkbox"/>	Please retain samples. Asphalt base rock parking lot			
S-8 Base	Soil/Subbase	4/15/14								<input type="checkbox"/>	Asphalt base rock black top			
B-2 Base	Soil/Subbase	4/15/14								<input type="checkbox"/>	Basement building			
S-7 Base	Soil/Subbase	4/15/14								<input type="checkbox"/>	Asphalt base rock			
B-9 Base	Soil/Subbase	4/15/14								<input type="checkbox"/>	Basement building			
B-3 Base	Soil/Subbase	4/15/14								<input type="checkbox"/>	Basement building			
B-1 Base	Soil/Subbase	4/15/14								<input type="checkbox"/>	Basement building			
S-11 Base	Soil/Subbase	4/15/14								<input type="checkbox"/>	Asphalt base rock parking lot			
										<input type="checkbox"/>				
										<input type="checkbox"/>				
										<input type="checkbox"/>	* Please retain all samples for potential TEM analyses. *			
										<input type="checkbox"/>				
Submitted By <i>Chris</i>						Received By <i>Wendy Bellah</i>								
Date/Time Submitted 4/17/14 1113						Date/Time Received 4/17/14 1113								
Submitted By <i>Wendy Bellah</i>						Received By <i>ATEM/RT</i>								
Date/Time Submitted 04-17-14 P02:33 IN						Date/Time Received 04-17-14 P02:32 IN								

*All samples will be held for 3 months from the date of receipt at ATEM. Additional sample storage time may be obtained through ATEM Customer Service

APPENDIX C

Base Rock Cap Operations and Maintenance Plan

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