CITY OF CHANDLER ENVIRONMENTAL MANAGEMENT

FINAL REVISED REMOVAL ACTION PLAN

K&K AERIAL APPLICATOR SITE
VRP SITE CODE 514031-00

DECEMBER 21, 2023

Please be advised that, effective September 21, 2022, Wood Environment & Infrastructure Solutions, Inc. Was acquired by WSP. Due to the acquisition, we have changed our name to WSP USA Environment & Infrastructure Inc. No other aspects of our legal entity or capabilities have changed for this report, including our Federal Tax ID which remains 91-1641772. Correspondence for this report should continue to be addressed to the undersigned.

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VRP SITE CODE 514031-00

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TYPE OF DOCUMENT (FINAL REVISED)

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December 21, 2023

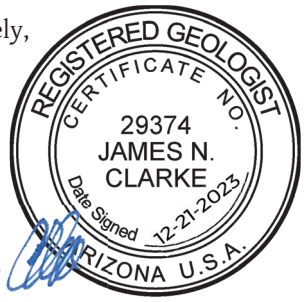
Mr. Jon Sherrill
Environmental Program Manager
City of Chandler Environmental Management
175 South Arizona Avenue, 4th Floor
Chandler, AZ 85225

Re: Final Revised Removal Action Plan
K&K Aerial Applicator Site
Chandler Municipal Airport
Chandler, Arizona
VRP Site Code 514031-00

Dear Mr. Sherrill:

The Final Removal Action Plan (RAP) for the former K&K Aerial Applicator Site (the Site) was submitted to the Arizona Department of Environmental Quality (ADEQ) Voluntary Remediation Program (VRP) on July 26, 2023 for review and comment. Comments were received from ADEQ VRP on September 1, 2023. The ADEQ comment letter dated September 1, 2023 is included as Appendix A. WSP USA Environment & Infrastructure, Inc. (WSP) prepared Responses to Comments that are included as Appendix B and revised the RAP where indicated. A Revised RAP was submitted to ADEQ on September 18, 2023. A meeting was held between WSP, Chandler, and VRP staff on October 4, 2023 to discuss the responses to the comments. ADEQ had additional comments. These were addressed in a second revision to the RAP that was submitted to ADEQ on October 16, 2023. ADEQ sent a comment letter dated November 17, 2023 (included in Appendix A) requesting the collection and pesticide analysis of 21 additional samples from on-Site soil piles that are planned to be used as on-Site backfill. These samples were collected on November 30, 2023 and as requested by ADEQ the results are included in the RAP. Therefore, WSP is pleased to submit this Final Revised Removal Action Plan for the former K&K Aerial Applicator Site (the Site) located at Chandler Municipal Airport.

Yours sincerely,



James N. Clarke, PG
Assistant VP, Geologist

Tim Ostapuk
Vice President, Arizona Business Lead

cc: Nichole Osuch, ADEQ Voluntary Remediation Program

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ABBREVIATIONS AND ACRONYMS

10^{-5}	1 in 100,000
A.A.C	Arizona Administrative Code
A.R.S.	Arizona Revised Statutes
ACM	Asbestos containing materials
ADEQ	Arizona Department of Environmental Quality
AHERA	Asbestos Hazard Emergency Response Act
AOC	Area of Contamination

ARAR	Applicable, Relevant, and Appropriate Requirements
bgs	below ground surface
BMP	Best Management Practice(s)
°C	Degrees Celsius
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
Cl	Chlorine
COPC	Contaminant(s) of Potential Concern
COC(s)	Contaminant(s) of Concern
Cr III	Trivalent chromium
Cr VI	Hexavalent chromium
CSEM	Conceptual site exposure model
cuyds	cubic yards
DDD	4,4'-Dichlorodiphenyldichloroethane
DDE	4,4'-Dichlorodiphenyldichloroethylene
DEUR	Declaration of Environmental Use Restriction
DPT	Direct-push technology
DQI	Data quality indicators
DQO	Data Quality Objectives
DQP	VRP Data Quality Plan for Work Plan/SAP Development
DU	Decision units
EE/CA	Engineering Evaluation/Cost Analysis
EPA	United States Environmental Protection Agency
Eurofins	Eurofins Environment Testing America
°F	Degrees Fahrenheit
FSP	Field Sampling Plan
ft	foot, feet
g	gram
GPL	Groundwater protection levels
HASP	Health and Safety Plan
IDW	Investigation derived waste
lbs	pounds
mg/L	milligrams per liter
mg/kg	milligrams per kilogram
MS/MSD	Matrix Spike/Matrix Spike Duplicate

Na	Sodium
NFA	No further action
NRSRL	Non-Residential Soil Remediation Level
oz	ounce
PAH	Polynuclear aromatic hydrocarbons
PID	Photoionization Detector
PLM	Polarized light microscopy
PPE	Personal protection equipment
ppm	parts per million (same as mg/kg or mg/L)
QA	Quality Assurance
QC	Quality control
RAA	Removal action alternative
RACR	Removal Action Completion Report
RAO	Removal action objectives
RAP	Removal Action Plan
RCRA	Resource Conservation and Recovery Act
RL	Reporting Limit
RSRL	Residential Soil Remediation Level
SAP	Sampling plan
SDS	Safety data sheets
SOP	Standard Operation Procedure
sqft	square feet
SSO	Solid Singlet Oxygen
SWPPPP	Stormwater Pollution Protection Plan and Permit
TCLP	Toxicity characteristic leaching procedure
VOC	Volatile organic compounds
VRP	Voluntary Remediation Program
Wood E&IS	Wood Environment & Infrastructure Solutions, Inc.
WSP	WSP USA Environment & Infrastructure, Inc.

1 INTRODUCTION

The K&K Aerial Applicator site is located in Chandler, Arizona and consists of a triangular-shaped, approximate 15-acre parcel located west of Cooper Road and in the southern portion of the Chandler Municipal Airport (the Site) (**Figure 1**). The Site is owned by the City of Chandler (the City). An aerial pesticide applicator company, K&K Aerial Applicators, leased the property from the City and conducted operations at the Site from approximately the late 1970s to the 1980s. However, aerial applicator operators had used the Site since the 1940s. The City was planning redevelopment of the Site. Therefore, a limited Site investigation was performed in the early 1990s to evaluate potential pesticide contamination in soil resulting from past pesticide aerial applicator activities. Results indicated that toxaphene, an organochlorine pesticide, was present in Site surface soils at concentrations above minimum Arizona soil cleanup levels. The highest concentrations of toxaphene were found around former structures that were once occupied by K&K Aerial Applicators. Due to the presence of toxaphene in the soil above minimum soil cleanup levels, the City decided to delay planned development of the Site. There is also an unlined and pre-Resource Conservation and Recovery Act (RCRA) Subtitle D landfill present in the southeast portion of the Site. The landfill contains debris originating from the demolition of the former Chandler City Hall.

During 2021, there was renewed interest in developing the Site as part of Chandler Municipal Airport. The planned use is aviation operations consisting of tarmac, aircraft storage, hangers, shops, and offices. Therefore, the City authorized Wood Environment & Infrastructure Solutions, Inc. (Wood E&IS) to conduct an Engineering Evaluation/Cost Analysis (EE/CA) of the Site (Wood E&IS, 2022). Wood E&IS was acquired by WSP on September 21, 2022. Therefore, our name has been changed to WSP USA Environment & Infrastructure Inc. (WSP).

The EE/CA found that toxaphene, 4,4'-dichlorodiphenyldichloroethylene (DDE), and 4,4'-dichlorodiphenyltrichloroethane (DDT) are present in soil at the Site above their one-in-100,000 (10^{-5}) cancer risk residential soil remediation levels (RSRLs) (Arizona Administrative Code [A.A.C] R18-7-205E) of 5, 20, and 20 milligrams per kilogram (mg/kg), respectively. For carcinogens, unless the compound is identified as a known human carcinogen, the RSRL will be based on a 10^{-5} cancer risk (A.A.C R18-7-205E). Toxaphene, 4,4-DDE, and 4,4-DDT are not listed as known human carcinogens. Therefore, the 10^{-5} RSRLs were applied.

Based on the results of the EE/CA and planned use of the Site, in-situ chemical oxidation treatment was selected as the preferred removal action alternative (RAA) for the Site. Therefore, this Removal Action Plan (RAP) provides the following:

— Site background;
— EE/CA summary;
— Removal action procedures and design;
— Removal action confirmation sampling and analysis plan/field sampling plan (SAP/FSP); and,
— Removal action completion requirements.

1.1 REGULATORY AUTHORITY

WSP understands that the City is performing this removal action on a voluntary basis and that no action order has been issued by either the Arizona Department of Environmental Quality (ADEQ) or the United States Environmental Protection Agency (EPA). WSP used regulatory action levels established by ADEQ and the USEPA that are protective of human health when developing and selecting the RAA for the Site. Regulatory oversight for the scope of work presented by this RAP is being provided by the ADEQ Voluntary Remediation Program (VRP). The VRP will be responsible for regulatory review and approval of project documents and issuance of a Letter of No Further Action upon completion of the scope of work and request by the City. The VRP Site Code is 514031-00. This RAP has been prepared in general accordance with Arizona Revised Statutes §49-175, the ADEQ VRP Work Plan Checklist (ADEQ 2013, revised 2017) and the ADEQ VRP Data Quality Plan for Work Plan/SAP Development (VRP DQP) (ADEQ, 2021).

1.2 KEY WSP PERSONNEL

Per the VRP DQP, Table 1-1 below provides the key WSP personnel for the removal action.

Table 1-1 Key WSP Personnel

POSITION	NAME
Project Manager	Jim Clarke, PG – Assistant VP, Geologist
Sampling Team Leader	Kyle Lee
Field Scientist	Jacob Salmon
Quality Assurance Coordinator	Tim Ostapuk – Vice President, Arizona Business Lead
Peer Reviewer	Doug Fisher, PE – Assistant VP, Engineer

1.3 COMMUNITY INVOLVEMENT PLAN

The Site is currently owned by the City and is located within the secure area of Chandler Municipal Airport. The Site is generally surrounded by property associated with Chandler Municipal Airport. Runways and taxiways border the Site to the northwest and north. Property located to the east of the Site is currently undeveloped and has been used for agricultural purposes. Property located to the south of the Site is currently being developed industrially. The Site is accessible only by authorized airport operations personnel. Chandler Municipal Airport will notify airport users of the removal action activities. A sign notifying the public of the removal action activities will be posted at the Site. The planned sign is included in **Appendix C**.

This RAP is subject to a 30-day public comment period in accordance with Arizona Revised Statutes § 49-176(D).

2 SITE DESCRIPTION

2.1 SITE LOCATION AND SURROUNDING LAND USE

The Site consists of a triangular-shaped, 15-acre parcel located west of the Cooper Road alignment in the southern portion of the City of Chandler Municipal Airport in Chandler, Arizona (**Figure 1**). The Site is owned by the City. The Site, as defined for this RAP, covers a portion of Section 11 of Township 2 South, Range 5 East of the Gila and Salt River Base and Meridian.

The Site is generally surrounded by property associated with Chandler Municipal Airport. Runways and taxiways border the Site to the northwest and north. Property located to the east of the Site is currently undeveloped and has been used for agricultural purposes. Property located to the south of the Site is currently being developed industrially.

2.2 SITE HISTORY

An aerial pesticide applicator company, K&K Aerial Applicators, conducted operations at the Site from approximately the 1970s to the 1980s. However, aerial pesticide operators had used the Site since the 1940s. According to historical aerial photographs, aircraft and structures associated with aerial applicator operations were located throughout the Site over the duration that aerial applicator operators occupied the Site. Historical aerial photos available from the Maricopa County Assessor's office were reviewed. There is a gap in aerial photography availability from 1959 to 1976. The 1959 and 1976 aerial photographs show the structure that is shown in the northeast corner of the Site on **Figure 2**. However, the 1959 aerial photograph shows what appears to be a depression in the southern portion of the Site. This depression is not apparent in the 1976 aerial photograph.

2.3 CURRENT SITE CONDITIONS

The Site is currently vacant and undeveloped. The exception are communications towers located in the south-central portion of the Site used by Chandler Municipal Airport. Unrelated soil and gravel piles are present in the central portion of the Site (**Figure 2**). According to the City, the piles originated from unknown off-Site locations and have been deposited intermittently since the 1990s (confirmed per historical aerial imagery). The soil piles were not visible in the 1993 aerial photograph; however, they were visible in the 1996 aerial photograph. Based on measurements from recent aerial photographs an estimated 4,200 cubic yards (cuyds) of soil and gravel piles may be present on the Site. An unlined and pre-RCRA Subtitle D landfill is also present on-Site in the southeast portion of the property. This is located at the area of the depression observed in the 1959 aerial photograph. Depressions and cracks in the compacted soil cap were noted during the EE/CA and exposed material consisting primarily of broken concrete was observed. According to the City, the old Chandler City Hall was demolished and placed in the depression sometime in the 1960s or 1970s, which is the same time that the aerial applicator company was in operation. The demolition debris was then covered with on-Site soil. As previously stated, the depression is not visible in the 1976 aerial photograph. An airport perimeter roadway and fencing run along the western, eastern, and southern boundaries of the Site (**Figure 2**).

2.4 FUTURE SITE PLANS

The City is planning development of the Site with aviation operations that includes tarmac and large hangars with attached offices/shops.

3 EE/CA INVESTIGATION RESULTS SUMMARY

The Site was investigated by RW Beck/Dames & Moore in 1991 (Dames & Moore, 1991) and by WSP (formerly Wood) in 2022. The 1991 Dames & Moore Report is included as **Appendix D**. The results of the WSP Site investigation are presented in the EE/CA Report (Wood E&IS, 2022), which is included as **Appendix E**. Soil samples collected during the EE/CA investigation were analyzed for organochlorine pesticides, herbicides, volatile organic compounds (VOCs), polynuclear aromatic hydrocarbons (PAHs), and metals. However, based on previous soil investigations, toxaphene was identified as the primary compound of potential concern (COPC). For the EE/CA Site investigation, a total of 173 soil samples were field screened for toxaphene using immunoassay kits, including four duplicate samples. To confirm the field screening results, 52 samples, including two duplicate samples, were analyzed for organochlorine pesticides including toxaphene by United States Environmental Protection Agency (EPA) Method 8081A, which is approximately 30% of the samples. Therefore, evaluation of correlation between the field screening results and the laboratory results was required to characterize the toxaphene contamination:

- 40 samples (77%) correlated, which includes 14 samples where results did not correlate but the laboratory result was below the RSRL and within the range of the field screening result; and,
- 12 samples (23%) did not correlate.

Based on the above, the correlation was sufficient to use the field screening results to evaluate the extent of toxaphene impact at the Site. The toxaphene and pesticide sample analytical results are summarized in **Tables 3-1 and 3-2**.

3.1 SHALLOW SOIL INVESTIGATION

Previous investigation results indicated the shallow toxaphene soil impact is less than two ft deep (Dames & Moore, 1991 and **Appendix D**). The RW Beck/Dames & Moore soil sample/soil boring locations are shown on **Figure 2.** Based on the previous soil sample analytical results, the Site was divided into 71 cells or decision units (DUs). The DUs were approximately 100 feet (ft) by 100 ft, except for the DUs located along the northwestern diagonal boundary of the Site (**Figures 2 and 3**). A single direct-push technology (DPT) boring was advanced at the approximate center of each DU to one ft deep with soil samples collected from 0.5 ft and 1 ft. The exceptions are listed as follows:

- Based on field screening results, borings SB-9 and SB-13 (**Figure 3**) were each advanced to two ft and soil samples were collected at 1.5 and two ft to characterize the vertical extent of impact.
- Due to the presence of shallow landfill debris material, soil samples were collected only at 0.5 ft at boring SB-54, SB-55, SB-59, and SB-60. Deeper soil samples were collected within these DUs as part of the landfill investigation.

A total of 156 shallow soil samples were collected and field-screened for VOCs using a photoionization detector (PID) and for toxaphene using the immunoassay test kits. These parameters were subsequently used to select soil samples for fixed-based laboratory analyses. The immunoassay field screening results are provided in **Table 3-1** and are compared to the laboratory toxaphene results.

3.1.1 TOXAPHENE AND ORGANOCHLORINE PESTICIDES

RW Beck collected soil samples for pesticide analysis by EPA Method 8080 from nine sample points on the Site identified as KK-9, KK-13, KK-14, KK-15, KK-16, KK-17, KK-18, KK-19, and KK-20 on **Figure 2**. Soil samples were collected from 0-6 inches at the sample points. However, deeper samples were collected at KK-6 (6-8 inches) and at KK-16 (8-10 inches) (Dames & Moore, 1991). A soil boring was advanced by Dames & Moore at KK-15 and soil

samples for vertical characterization were collected from 0"-8", 8"-16", 1.5'-2', 4.5'-5', and 14.5'-15'. The analytical results for these samples are summarized in **Table 3-2.** The results for the nine surface soil samples (0-6") are summarized as follows:

- Toxaphene was detected in the nine samples and ranged in concentration from 0.27 mg/kg (KK-20) to a maximum of 960 mg/kg (KK-14). Eight of the nine soil samples exceeded the 10^{-5} RSRL of 5.0 mg/kg and the Non-Residential Soil Remediation Level (NRSRL) of 16 mg/kg.
- DDE was analyzed in seven and the nine samples and was detected in the seven samples ranging from 4.2 mg/kg (KK-18) to 63 mg/kg. DDE exceeded the 10^{-5} RSRL of 20 mg/kg in three samples; however, DDE did not exceed the NRSRL of 70 mg/kg.
- DDT was analyzed in five of the nine samples and was detected in the five samples ranging from 4.2 to 160 mg/kg. DDT exceeded the 10^{-5} RSRL of 20 mg/kg and the NRSRL of 70 mg/kg in two samples.

During the EE/CA investigation, a total of 44 soil samples, including two duplicate samples, were selected for organochlorine pesticide analyses by EPA Method 8081A, which is approximately 28% of the total number of samples collected. The analytical results are summarized in **Tables 3-1 and 3-2**.

Toxaphene, 4,4-DDE, 4,4-DDT, alpha-BHC, beta-BHC, and gamma-BHC were the only pesticides detected in the soil samples (**Table 3-2**). The results of the EE/CA investigation are summarized as follows:

- Toxaphene was detected in 41 of the 44 EE/CA investigation samples (**Tables 3-1 and 3-2**), ranging from 0.088 mg/kg to 1,100 mg/kg. Nineteen (19) of the samples were detected with toxaphene equaling or exceeding the 10^{-5} RSRL of 5.0 mg/kg, 11 of which exceeded the Non-Residential Soil Remediation Level (NRSRL) of 16 mg/kg.
- One of the possible removal action alternatives evaluated was capping in-place. Therefore, sample SB-18-SS-6", which was reported with the highest toxaphene concentration of 1,100 mg/kg, was further analyzed for leachable toxaphene by toxicity characteristic leaching procedure (TCLP). The sample was reported with 0.34 milligrams per liter (mg/L) of toxaphene, which is below the regulatory level of 0.50 mg/L.
- DDE was detected in 41 of the 44 samples ranging from 0.0057 mg/kg to 57 mg/kg. DDE exceeded the 10^{-5} RSRL of 20 mg/kg in one sample (57 mg/kg); however, DDE did not exceed the NRSRL of 70 mg/kg.
- DDT was detected in 22 of the 44 samples, ranging from 0.0074 to 110 mg/kg. DDT exceeded the 10^{-5} RSRL of 20 mg/kg in two samples, one of which exceeded the NRSRL of 70 mg/kg.
- Alpha-BHC, which does not have a listed RSRL or NRSRL, was detected in three samples ranging from 0.0028 mg/kg to 0.18 mg/kg.
- Beta-BHC, which does not have a listed RSRL or NRSRL, was detected in 15 samples ranging from 0.0026 mg/kg to 0.88 mg/kg.
- Gamma-BHC (Lindane), which does not have a listed RSRL or NRSRL, was detected in three samples ranging from 0.0047 mg/kg to 0.30 mg/kg.

DDE and/or DDT exceeded their respective RSRLs only in soil samples reported with the highest toxaphene concentrations above 5.0 mg/kg.

The immunoassay results that did not have corresponding laboratory analytical data were grouped as <5.0 mg/kg, 5.0-16 mg/kg, and >16 mg/kg. Based on the results of the investigation, the extents of the shallow soil toxaphene impact above the RSRL and NRSRL of 5.0 and 16 mg/kg, respectively are shown on **Figure 3**. The approximate total area of toxaphene impacted soil is estimated as follows:

- Greater than 5.0 mg/kg - 322,743.73 square feet (sqft) or 7.41 acres; and,
- Greater than 16 mg/kg – 171,345.97 sqft or 4.07 acres.

Organochlorine pesticides that include toxaphene, DDE and DDT are not considered vertically mobile in soil. To define the vertical extent of impact, deeper soil samples were collected at on-Site RW Beck/Dames & Moore sample location KK-15 and WSP sample locations SB-9 and SB-13 (**Table 3-2**). The surface soil sample collected at KK-15 was reported with 850 mg/kg of toxaphene (exceeded NRSRL), 150 mg/kg of DDT (exceeded NRSRL), and 37

mg/kg 0f DDE (exceeded RSRL). Boring SB-9 was collected between RW Beck samples KK-9, KK-13, and KK-14 and was reported with an immunoassay toxaphene result of >16 mg/kg. Therefore, a sample was collected at two ft (24 inches) deep and analyzed for pesticides. The surface sample at SB-9 was expected to be detected with elevated concentrations of toxaphene; however, the laboratory reported 4.5 mg/kg of toxaphene, which is below the RSRL. Surface soil sample SB-13 was reported with an immunoassay toxaphene concentration of >16.8 mg/kg and was located near boring KK-15. Therefore, a soil sample was collected at two feet (24 inches) deep. The laboratory reported 140 mg/kg of toxaphene in soil sample SB13-SS-6-0330-SO-N, which exceeds the NRSRL of 16 mg/kg. DDT was also reported at 110 mg/kg, which exceeds the NRSRL of 70 mg/kg. As shown in **Table 3-2**, the soil samples collected at two ft or 24 inches deep from KK-15, SB-9, and SB-13 were reported with toxaphene, DDE, and DDT below their respective RSRLs.

As previously stated, four off-Site borings were advanced west of the Site. These locations are identified as KK-3, KK-5, KK-11, and KK-12. Surface soil samples (0-6") were reported with 130, 110, 67, and 5,300 mg/kg of toxaphene, all exceeding the NRSRL of 16 mg/kg (**Table 3-2**). DDE and DDT also exceeded the RSRLs. The analytical results for these boring locations are also included in **Table 3-2** to demonstrate vertical attenuation of toxaphene, DDE, and DDT in the soils at the Site. The results demonstrate that the concentrations of toxaphene, DDE, DDT attenuate with depth. At KK-3, KK-11, and KK-12, toxaphene, DDE, and DDT had attenuated below their respective RSRLs in the samples collected from 1.5'-2.0'. KK-12 was reported with the highest toxaphene, DDE, and DDT concentrations for the RW Beck investigation. At KK-5, toxaphene, DDE, and DDT were still above their RSRLs in the sample collected from 1.5'-2.0'; however, concentrations had attenuated below the RSRLs in the sample collected from 4.5'-5.0' and remained below RSRLs in the subsequent samples.

Based on the results of the 1991 investigation, Dames & Moore concluded that the toxaphene/DDE/DDT soil impact at the Site was not greater than two feet. This was confirmed by the WSP EE/CA samples. Therefore, the approximate volume of toxaphene impacted soil is estimated as follows:

— Greater than 5.0 mg/kg – 645,487.46 cubic feet (cuft) or 23,906.94 cuyds; and,

— Greater than 16 mg/kg – 342,691.94 cuft or 12,692.29 cuyds.

Applying a conversion factor of 1.5 tons/cuyd for in-place soil, the total weight of the impacted soil is approximately 35,861 tons.

3.1.2 HERBICIDES, PAHS, METALS, AND VOCS

Soil samples were analyzed for herbicides, polynuclear aromatic compounds (PAHs), and the eight Resource Conservation Recovery Act (RCRA) metals to evaluate if other contaminants were present in the soil. Herbicides, PAHs, and metals were not detected in soil samples above RSRLs or where applicable minimum groundwater protection levels (GPLs). Herbicides were not detected in the samples. The PAH and metals analytical data is summarized in **Tables 3-3 and 3-4**. PID readings did not indicate the presence of VOCs. Therefore, the soil samples were not analyzed for VOCs.

3.2 LANDFILL INVESTIGATION

A geophysical survey was used to evaluate the extent of the landfill. As shown on **Figures 2-4**, the landfill covers an area of 40,656.60 sqft or 0.93 acres. Ten test pits were excavated to examine the landfill contents and to collect samples (**Figures 3 and 4**). The materials were buried up to a depth of 10 ft below ground surface (bgs) and were mixed with soil. The following is a list of materials that were observed in each test pit:

— Test Pit #1 – Concrete

— Test Pit #2 – No debris was observed.

— Test Pit #3 – Concrete, red clay tile, drywall, and plaster

— Test Pit #4 – Concrete, plaster, steel hose reel assembly.

— Test Pit #5 – Concrete and insulation wrap material.

— Test Pit #6 – Cementitious tile material, concrete block and mortar, and plaster
— Test Pit #7 – Concrete and vinyl floor tile.
— Test Pit #8 – Concrete
— Test Pit #9 – Concrete and asphalt\
— Test Pit #10 – Concrete

Based on the test pits, the depth of the landfill does not exceed 10 ft. Therefore, the estimated volume of materials in the landfill is 406,466 cuft or 15,058 cuyds. Based on observations of the test pits, the landfill materials contain approximately 50% soil or approximately 7,500 cuyds of soil. The soil mixed with the landfill debris originated from the Site.

3.2.1 TOXAPHENE AND ORGANOCHLORINE PESTICIDES

A total of 17 soil samples were collected. The soil samples were field screened for VOCs using a PID and for toxaphene using the immunoassay test kits. The soil samples are further characterized as follows:

— Six surface soil samples;
— One within the landfill materials (TP-4-SS-5'); and,
— Ten native soil samples below the landfill materials (samples TP-1-SS-6' and TP-2-SS-5' are on the perimeter of the landfill).

The surface soil covering the landfill materials is considered impacted with toxaphene above the NRSRL of 16 mg/kg based on field screening results for surface soil samples SB-54, SB-55, SB-59, and SB-60; and that sample SB-55-6" was reported with 56 mg/kg of toxaphene (**Figure 3**). The native soil samples were of interest because they were used to evaluate if the native soils below the landfill materials had been impacted by toxaphene. The immunoassay field screening results are provided in **Table 3-1** and are compared to the laboratory toxaphene results. The organochlorine pesticide results are summarized in **Table 3-2**. The following summarizes the field screening results for toxaphene:

— Samples TP-5-SS-10' and TP-8-SS-10' were screened with toxaphene less than or equal to 2.8 mg/kg (below RSRL of 5.0 mg/kg);
— Samples TP-2-SS-5', TP-4-SS-10', TP-6-SS-10', TP-7-SS-10', TP-9-SS-10', and TP-10-SS-10' were field-screened with 2.8-16 mg/kg of toxaphene and possibly above the RSRL of 5.0 mg/kg; and,
— Samples TP-1-SS-6' and TP-3-SS-10' were field-screened with >16 mg/kg of toxaphene and possibly above the NRSRL of 16 mg/kg.

Samples TP-3-SS-10', TP-4-SS-10', TP-6-SS-10', TP-7-SS-10', and TP-8-SS-10' were selected and analyzed for organochlorine pesticides by EPA Method 8081A, which is 29% of the samples.

As shown in **Table 3-2**. Toxaphene, 4,4-DDE, 4,4-DDT, and dieldrin were the only pesticides detected in the soil samples. The results are summarized as follows:

— Toxaphene was detected in the five samples, ranging from 0.18 mg/kg (sample TP-8-SS-10') to 620 mg/kg (TP-3-SS-10'). Two (2) of the samples (TP-3-SS-10' and TP-7-SS-10') were detected with toxaphene exceeding the NRSRL of 16 mg/kg. The concentration of toxaphene detected in sample TP-3-SS-10' is the second highest toxaphene concentration reported for all the samples collected during the EE/CA investigation.
— One of the possible removal action alternatives is capping in-place. Therefore, sample TP-3-SS-10' was further analyzed for leachable toxaphene by TCLP. The sample was reported with 0.44 mg/L of toxaphene, which is below the regulatory level of 0.50 mg/L.
— DDE was detected in the five samples ranging from 0.011 mg/kg to 15 mg/kg. DDE did not exceed the 10^{-5} RSRL of 20 mg/kg.

- DDT was detected in four samples, ranging from 0.021 to 160 mg/kg. DDT exceeded the RSRL and NRSRL of 20 and 70 mg/kg, respectively in one sample, TP-3-SS-10' (160 mg/kg), which was detected with the highest toxaphene concentration of the landfill area samples.
- Dieldrin was only detected in sample TP-8-SS-10' at a concentration of 0.0052 mg/kg, which is below the RSRL of 0.34 mg/kg.

Based on the discussion in Section 3.1.1, the thickness of the toxaphene impacted soil at a depth of 10 ft is also expected to be two feet. The area of the landfill is 40,656.60 sqft. Therefore, the estimated volume of toxaphene impacted soil below the landfill materials is 3,012 cuyds or 4,518 tons. There are an additional 7,500 cuyds or 11,250 tons of soil mixed with the landfill debris. Based on the toxaphene results for soil samples collected above and below the landfill materials (**Tables 3-1 and 3-2**), the soil mixed with the landfill debris is considered to be impacted with toxaphene above 5.0 m/kg.

3.2.2 PAHS, METALS, AND VOCS

Seventeen soil samples were collected from the landfill area excavation and analyzed for PAHs, metals, and VOCs. The PAH and metals analytical results are summarized in **Tables 3-3 and 3-4**. PAHs and metals were not detected above RSRLs or where applicable GPLs. VOCs were not detected in the samples.

3.2.3 POTENTIAL ASBESTOS CONTAINING MATERIALS

Forty-eight (48) samples were submitted to Fiberquant Analytical Services for Polarized Light Microscopy analysis for asbestos in a bulk sample. Asbestos was not detected in any of the samples collected from the landfill.

3.2.4 POTENTIAL LEAD-BASED PAINT

Five (5) samples were collected from painted debris observed in the landfill and analyzed by Atomic Absorption Spectrometer analysis of paint. The following materials were sampled along with the results of lead in paint in parts per million (ppm):

- TP3-PB1 – Tan Paint on Plaster: 390 ppm
- TP3-PB2 – Yellow Paint on Plaster: 330 ppm
- TP4-PB1 – Red Paint on Reel Assembly: 950 ppm
- TP6-PB1 – Yellow Paint on Block: 120 ppm
- TP6-TP2 – Yellow Paint on Block Tile: <27ppm

3.3 SOIL AND GRAVEL PILE INVESTIGATION

As shown on **Figures 2 through 5**, there are multiple soil piles present on the Site. The piles are generally no more than 3-4 feet high. Based on evaluation of aerial photos, the soil piles consist of approximately 4,200 cuyds of soil. The origin of the soil is unknown. Therefore, samples were collected from the soil piles to evaluate if the soil contains analytes above RSRLs or GPLs. The analytical data would be used to determine if the soil could be used on-Site as fill, would be included in the selected removal action, or disposed off-Site. Twenty-one (21) soil piles were selected for sampling as shown on **Figure 5**. A four-part composite sample was collected from each pile for analyses. The results are summarized in the following subsections.

3.3.1 TOXAPHENE AND ORGANOCHLORINE PESTICIDES

Samples SP-1 through SP-10 were field-screened for toxaphene using the immunoassay kits (**Table 3-1**). Samples SP-1 through SP-6 were reported with <2.8 mg/kg of toxaphene. Samples SP-7 and SP-8 were reported with

between 2.8 and 16.8 mg/kg of toxaphene and samples SP-9 and SP-10 were reported with >16.8 mg/kg of toxaphene. Therefore, samples SP-8, SP-9, and SP-10 were analyzed for organochlorine pesticides by EPA Method 8081. Toxaphene and 4,4-DDE were the only organochlorine pesticides detected in the samples. The results are summarized as follows (Wood E&IS, 2022 and **Table 3-2**):

- Toxaphene was detected at concentrations of 0.11, 0.18, and 0.11 mg/kg, respectively which are below the 10^{-5} RSRL of 5.0 mg/kg.
- 4,4-DDE was detected at concentrations of 0.0043, 0.065, and 0.027 mg/kg, respectively which are below the 10^{-5} RSRL of 20 mg/kg.

As requested by ADEQ in the RAP comment letter dated November 17, 2023 (**Appendix A**), an additional 21 composite soil samples were scheduled to be collected from the soil piles on November 30, 2023. However, 20 samples were collected at locations SP-1 through SP-7, SP-11 through SP-17, SP-19 through SP-24 (**Figure 5**). A sample was not collected at SP-18. The coordinates for the sample locations were loaded into a tablet equipped with a global positioning system (GPS). The field scientist then walked to each location using the tablet and GPS to collect the composite sample. Using a decontaminated trowel, a scoop of soil was collected approximately 6-12 inches into the pile. Rocks were removed and a portion of the soil was added to a 4-ounce glass sample jar provided by Pace Analytical. This procedure was repeated three additional times until the sample jar was approximately 75 percent full. The jar was then shaken until the soil was thoroughly mixed. The samples were submitted to Pace Analytical and analyzed for organochlorine pesticides by EPA Method 8081A. The results are summarized in **Table 3-2** and the Pace analytical report is included in **Appendix F**. The results are summarized as follows:

- Toxaphene was detected at a concentration of 1.07 mg/kg in sample SP4-SS-113023-SO-N, which is below the 10^{-5} RSRL of 5.0 mg/kg. The other samples were reported with non-detectable concentrations of less than (<) 0.400 mg/kg. The detection limit is below the 10^{-5} RSRL of 5.0 mg/kg.
- 4,4-DDE was detected in samples SP4-SS-113023-SO-N, SP5-SS-113023-SO-N, SP6-SS-113023-SO-N, SP7-SS-113023-SO-N, SP19-SS-113023-SO-N, SP21-SS-113023-SO-N, SP22-SS-113023-SO-N, and SP24-SS-113023-SO-N at concentrations of 0.0281, 0.0302, 0.0617, 0.0445, 0.0536, 0.669, 0.0231, and 0.0718 mg/kg, respectively which are below the 10^{-5} RSRL of 20 mg/kg. The other samples were reported with non-detectable concentrations of <0.020 mg/kg. The detection limit is below the 10^{-5} RSRL of 20 mg/kg.

All other organochlorine pesticides were non-detect in the samples.

Based on the analytical results, the soil piles do not contain organochlorine pesticides, most notably toxaphene, 4,4-DDE, and 4,4-DDT above their respective 10^{-5} RSRLs of 5.0, 20, and 20 mg/kg.

3.3.2 PAHS, METALS, AND VOCS

The twenty-one (21) four-part composite samples collected from the soil piles were submitted for the following analyses: VOCs by EPA Method 8260B, the eight RCRA Metals by EPA SW-846 Methods 6010B/7471A and PAHs by EPA Method 8270 SIM. The PAH and metals analytical results are summarized in **Tables 3-3 and 3-4**. PAHs, metals, and VOCs were not detected above RSRLs or where applicable GPLs.

Table 3-1. Toxaphene Immunoassay Soil Sample Results

Date	Location ID	Sample ID	Arizona Residential Soil Remediation Level[1]			Toxaphene[3]			
			Arizona Non-Residential Soil Remediation Level[2]			5.0			
			Depth (feet)	PID (ppmv)	Soil Description	16.0			Comments
Toxaphene						Concentration (mg/kg)			
						Immunoassay		Laboratory	
						OD[4]	Result		
AOC No. 3									
3/28/2022	SB-54	SB54-SS-6"-0322-SO-N	0.5	1.2	Clayey Sand with slight coarse gravels	1.02	***>2.8***		
3/28/2022	SB-55	SB55-SS-6"-0322-SO-N	0.5	0.8	Fine to medium clayey sand	0.8	***>2.8***	***56***	Immunoassay and laboratory results correlate
3/28/2022	SB-59	SB59-SS-6"-0322-SO-N	0.5	0.1	Fines with trace sand	1.1	***>2.8***		
3/28/2022	SB-60	SB60-SS-6"-0322-SO-N	0.5	0.1	Clay with fine-grained sand	1.12	***=2.8***		
3/28/2022	SB-56	SB56-SS-6"-0322-SO-N	0.5	3.1	silty sand with trace fine gravel	1.12	***=2.8***		
3/28/2022	SB-56	SB56-SS-12"-0322-SO-N	1	2.2	silty sand with trace fine gravel	1.09	***>2.8***		
3/28/2022	SB-57	SB57-SS-6"-0322-SO-N	0.5	1.8	Sand with trace fine gravel	1.06	**>2.8**	**5.6**	Immunoassay and laboratory results correlate
3/28/2022	SB-57	SB57-SS-12"-0322-SO-N	1	1.6	Clay with fine-grained gravel	0.95	***>2.8***		
3/28/2022	SB-58	SB58-SS-6"-0322-SO-N	0.5	4.4	Fine sand with medium-grained gravel	1.1	***>2.8***		
3/28/2022	SB-58	SB58-SS-12"-0322-SO-N	1	1.3	Fine sand with medium-grained gravel	1.13	<2.8		
3/28/2022	SB-61	SB61-SS-6-0328-SO-N	0.5	1	Silty sand with fine-grained gravel	1.14	<2.8	<2.0	Immunoassay and laboratory results correlate
3/28/2022	SB-61	SB61-SS-12"-0322-SO-N	1	2.4	Silty sand with fine-grained gravel	1.15	<2.8		
3/28/2022	SB-62	SB62-SS-6"-0322-SO-N	0.5	1.8	Silty sand	1.04	**>2.8**	**8.4**	Immunoassay and laboratory results correlate
3/28/2022	SB-62	SB62-SS-12"-0322-SO-N	1	2.4	Silty sand	1.11	**>2.8**		
3/28/2022	SB-63	SB63-SS-6-0328-SO-N	0.5	0	Silty sand with medium-grained gravel	1.13	<2.8	**14**	Immunoassay and laboratory results do not correlate
3/28/2022	SB-63	SB63-SS-12"-0322-SO-N	1	0.8	Clayey sand	1.15	<2.8		
3/28/2022	SB-64	SB64-SS-6"-0322-SO-N	0.5	0.6	Clayey sand with trace gravel	1.15	<2.8		
3/28/2022	SB-64	SB64-SS-12"-0322-SO-N	1	1.6	Clayey sand with trace gravel	1.16	<2.8		
						1.15	NC		
						NA	<0.560		
						1.12	<2.8		
						NA	<16.8		

Table 3-1. Toxaphene Immunoassay Soil Sample Results

Date	Location ID	Sample ID	Depth (feet)	PID (ppmv)	Soil Description	Toxaphene[3] Concentration (mg/kg) Immunoassay OD[4]	Toxaphene[3] Concentration (mg/kg) Immunoassay Result	Toxaphene[3] Concentration (mg/kg) Laboratory	Comments
Arizona Residential Soil Remediation Level[1]						5.0			
Arizona Non-Residential Soil Remediation Level[2]						16.0			
Toxaphene									
AOC No. 3									
3/28/2022	SB-65	SB65-SS-6"-0322-SO-N	0.50	0.60	Organic-rich silt with fine sand and gravel	0.75	>2.8		
3/28/2022	SB-65	SB65-SS-12"-0322-SO-N	1.00	0.60	Organic-rich silt with fine sand and gravel	0.68	>2.8	1.5	Immunoassay and laboratory results do not correlate; however, below RSRL
3/28/2022	SB-66	SB66-SS-6"-0322-SO-N	0.50	0.40	Clayey sand with white staining	0.98	<2.8		
3/28/2022	SB-66	SB66-SS-12"-0322-SO-N	1.00	0.40	Clay with Sand	1.00	<2.8		
3/28/2022	SB-67	SB67-SS-6"-0322-SO-N	0.50	2.40	Clayey sand with some white staining	0.89	***>2.8***		
3/28/2022	SB-67	SB67-SS-12"-0322-SO-N	1.00	4.80	Clayey sand	0.63	***>2.8***	***17***	Immunoassay and laboratory results correlate
3/28/2022	SB-68	SB68-SS-6"-0322-SO-N	0.50	2.80	Clayey sand	0.88	>2.8		
3/28/2022	SB-68	SB68-SS-12"-0322-SO-N	1.00	5.40	Clayey sand with fine-grained gravel	1.02	>2.8		
3/28/2022	SB-69	SB69-SS-6"-0322-SO-N	0.50	4.50	Clayey sand with fine-grained gravel	0.89	>2.8		
3/28/2022	SB-69	SB69-SS-12"-0322-SO-N	1.00	5.30	Clayey sand with fine-grained gravel	0.63	>2.8	2.5	Immunoassay and laboratory results do not correlate; however, below RSRL
3/28/2022	SB-70	SB70-SS-6-0328-SO-N	0.50	1.80	Clayey sand with fine-grained gravel	0.97	<2.8	5.0	Immunoassay and laboratory results do not correlate
3/28/2022	SB-70	SB70-SS-12"-0322-SO-N	1.00	3.90	Clayey sand	0.89	>2.8		
3/28/2022	SB-71	SB71-SS-6"-0322-SO-N	0.50	1.60	Fines with trace fine-grained sand	0.84	**>2.8**	**7.8**	Immunoassay and laboratory results correlate
3/28/2022	SB-71	SB71-SS-12"-0322-SO-N	1.00	2.50	Fines with trace fine-grained sand	1.12	**>2.8**		
AOC No. 2									
3/29/2022	SB-28	SB28-SS-6-0329-SO-N	0.50	0.00	Fines with trace fine-grained sand	1.06	<2.8	0.59	Immunoassay and laboratory results correlate
3/29/2022	SB-28	SB28-SS-12"-0322-SO-N	1.00	0.00	Fines with trace fine-grained sand	1.04	<2.8		
3/29/2022	SB-29	SB29-SS-6"-0322-SO-N	0.50	0.00	Fines with trace fine-grained sand	1.00	<2.8		
3/29/2022	SB-29	SB29-SS-12"-0322-SO-N	1.00	0.00	Fines with trace fine-grained sand	1.08	<2.8		
Immunoassay Calibrator Data - Kit 2						1.13	NC		
						NA	<0.56		
						0.95	<2.8		
						NA	<16.8		

Table 3-1. Toxaphene Immunoassay Soil Sample Results

Date	Location ID	Sample ID	Depth (feet)	PID (ppmv)	Soil Description	Toxaphene[3] Concentration (mg/kg)			Comments
Arizona Residential Soil Remediation Level[1]						5.0			
Arizona Non-Residential Soil Remediation Level[2]						16.0			
Toxaphene						Immunoassay OD[4]	Immunoassay Result	Laboratory	
AOC No. 2									
3/28/2022	SB-30	SB30-SS-6"-0322-SO-N	0.50	1.00	Silty sand with gravel	0.75	**>2.8**	**11**	Immunoassay and laboratory results correlate
3/28/2022	SB-30	SB30-SS-12"-0322-SO-N	1.00	0.60	Silty sand	1.15	<2.8		
3/28/2022	SB-31	SB31-SS-6"-0322-SO-N	0.50	0.20	Fines with fine-grained sand	1.16	<2.8		
3/28/2022	SB-31	SB31-SS-12"-0322-SO-N	1.00	0.20	Fines with fine-grained sand	1.12	<2.8		
3/28/2022	SB-32	SB32-SS-6"-0322-SO-N	0.50	0.60	Clayey sand with fine to medium-grained gravel	0.84	***>2.8***	***24***	Immunoassay and laboratory results correlate
3/28/2022	SB-32	SB32-SS-12"-0322-SO-N	1.00	0.50	Clayey sand with fine to medium-grained gravel	1.00	***>2.8***		
3/28/2022	SB-33	SB33-SS-6"-0322-SO-N	0.50	0.20	Clayey sand	1.16	<2.8		
3/28/2022	SB-33	SB33-SS-12"-0322-SO-N	1.00	0.80	Clayey sand	1.15	<2.8		
3/28/2022	SB-34	SB34-SS-6"-0322-SO-N	0.50	0.50	Fines with sand	0.57	***>2.8***	***97***	Immunoassay and laboratory results correlate
3/28/2022	SB-34	SB34-SS-12"-0322-SO-N	1.00	0.50	Fines with sand	1.13	<2.8		
3/28/2022	SB-35	SB35-SS-6"-0322-SO-N	0.50	0.20	Fines with sand	1.05	**>2.8**		
3/28/2022	SB-35	SB35-SS-12"-0322-SO-N	1.00	0.40	Fines with sand	1.13	<2.8		
3/28/2022	SB-36	SB36-SS-6"-0322-SO-N	0.50	0.50	Clayey sand	1.17	<2.8		
3/28/2022	SB-36	SB36-SS-12"-0322-SO-N	1.00	0.80	Clayey sand	0.99	**>2.8**		
3/28/2022	SB-37	SB37-SS-6-0328-SO-N	0.50	0.10	Fines with sand	1.12	<2.8	0.088	Immunoassay and laboratory results correlate
3/28/2022	SB-37	SB37-SS-12"-0322-SO-N	1.00	0.00	Fines with sand	1.15	<2.8		
3/28/2022	SB-38	SB38-SS-6"-0322-SO-N	0.50	0.40	Fines with sand	1.14	<2.8		
3/28/2022	SB-38	SB38-SS-12"-0322-SO-N	1.00	0.40	Fines with sand	1.15	<2.8		
Immunoassay Calibrator Data - Kit 3						1.13	NC		
						NA	<0.56		
						1.08	<2.8		
						NA	<16.8		

Table 3-1. Toxaphene Immunoassay Soil Sample Results

Date	Location ID	Sample ID	Depth (feet)	PID (ppmv)	Soil Description	Toxaphene[3]			Comments
			Arizona Residential Soil Remediation Level[1]			5.0			
			Arizona Non-Residential Soil Remediation Level[2]			16.0			
						Concentration (mg/kg)			
Toxaphene						Immunoassay		Laboratory	
						OD[4]	Result		
AOC No. 2									
3/29/2022	SB-39	SB39-SS-6"-0322-SO-N	0.5	0	Clays with trace sand	0.99	**>2.8**	**6.9**	Immunoassay and laboratory results correlate
3/29/2022	SB-39	SB39-SS-12"-0322-SO-N	1	0	Organic-rich clay with sand	0.86	**>2.8**		
3/29/2022	SB-40	SB40-SS-6"-0322-SO-N	0.5	0	Clays with trace sand	1.15	<2.8		
3/29/2022	SB-40	SB40-SS-12"-0322-SO-N	1	0	Clays with trace sand	1.13	<2.8		
3/29/2022	SB-41	SB41-SS-6"-0322-SO-N	0.5	0	Sand with clay	1.03	**>2.8**		
3/29/2022	SB-41	SB41-SS-12"-0322-SO-N	1	0	Sand with clay	0.62	**>2.8**		
3/29/2022	SB-42	SB42-SS-6"-0322-SO-N	0.5	0	Sandy clay	1.12	<2.8		
3/29/2022	SB-42	SB42-SS-12"-0322-SO-N	1	0	Sandy clay	1.13	<2.8		
3/29/2022	SB-43	SB43-SS-6"-0322-SO-N	0.5	0	Sandy clay. Some asphalt in soil	1.13	<2.8		
3/29/2022	SB-43	SB43-SS-12"-0322-SO-N	1	0	Sandy clay	1.13	<2.8		
3/29/2022	SB-44	SB44-SS-6"-0322-SO-N	0.5	0	Sandy clay	0.61	>2.8	1.9	Immunoassay and laboratory results do not correlate; however, below RSRL.
3/29/2022	SB-44	SB44-SS-12"-0322-SO-N	1	0	Sandy clay	1.08	<2.8		
3/29/2022	SB-45	SB45-SS-6"-0322-SO-N	0.5	0	Fines with fine-grained gravel	1.10	<2.8		
3/29/2022	SB-45	SB45-SS-12"-0322-SO-N	1	0	Fines with sand	1.13	<2.8		
3/29/2022	SB-46	SB46-SS-6"-0322-SO-N	0.5	0	Clays with sand. Roots present	1.09	<2.8		
3/29/2022	SB-46	SB46-SS-12"-0322-SO-N	1	0	Clays with sand. Roots present	0.94	>2.8	2.8	Immunoassay and laboratory results do not correlate; however, below RSRL.
3/29/2022	SB-47	SB47-SS-6"-0322-SO-N	0.5	0	Fines with sand. Organic matter present	1.14	<2.8		
3/29/2022	SB-47	SB47-SS-12"-0322-SO-N	1	0	Fines with sand. Organic matter present	0.59	>2.8	0.70	Immunoassay and laboratory results do not correlate; however, below RSRL.
Immunoassay Calibrator Data - Kit 4						1.11	NC		
						NA	<0.56		
						1.06	<2.8		
						NA	<16.8		

Table 3-1. Toxaphene Immunoassay Soil Sample Results

Date	Location ID	Sample ID	Depth (feet)	PID (ppmv)	Soil Description	Toxaphene[3] Concentration (mg/kg) Immunoassay OD[4]	Toxaphene[3] Concentration (mg/kg) Immunoassay Result	Toxaphene[3] Concentration (mg/kg) Laboratory	Comments
Arizona Residential Soil Remediation Level[1]						5.0			
Arizona Non-Residential Soil Remediation Level[2]						16.0			
Toxaphene									
AOC No. 2									
3/29/2022	SB-48	SB48-SS-6"-0329-SO-N	0.50	0.00	Fines with clay	1.14	<2.8		
3/29/2022	SB-48	SB48-SS-12"-0329-SO-N	1.00	0.00	clays with some sand	1.13	<2.8		
3/29/2022	SB-49	SB49-SS-6"-0329-SO-N	0.50	0.00	Fines. Some organic material present	1.14	<2.8		
3/29/2022	SB-49	SB49-SS-12"-0329-SO-N	1.00	0.00	Clays with sand. Roots present	1.11	<2.8		
3/29/2022	SB-50	SB50-SS-6"-0329-SO-N	0.50	0.00	Sand with fine-grained gravel	1.12	<2.8		
3/29/2022	SB-50	SB50-SS-12"-0329-SO-N	1.00	0.00	Clay with sand	1.12	<2.8		
3/29/2022	SB-51	SB51-SS-6"-0329-SO-N	0.50	0.00	Fines with fine to medium-grained gravel	1.12	<2.8		
3/29/2022	SB-51	SB51-SS-12"-0329-SO-N	1.00	0.00	Fines with sand	1.13	<2.8		
3/29/2022	SB-52	SB52-SS-6"-0329-SO-N	0.50	0.00	Clays with sand. Organic material present	1.15	<2.8		
3/29/2022	SB-52	SB52-SS-12"-0329-SO-N	1.00	0.00	Clays with sand. Organic material present	0.60	<2.8		
3/29/2022	SB-53	SB53-SS-6"-0329-SO-N	0.50	0.00	Clays wth sand and fine-grained gravel	0.90	**>2.8**	**16**	Immunoassay and laboratory results correlate
3/29/2022	SB-53	SB53-SS-12"-0329-SO-N	1.00	0.00	Clays wth sand and fine-grained gravel	0.90	**>2.8**		
AOC No. 4 Soil Piles									
3/30/2022	SP-1	SP1-SS-0322-SO-N		2.20	Silty sand with fine-grained gravel	1.23	<2.8		
3/30/2022	SP-2	SP2-SS-0322-SO-N		60.40	Silty sand with fine-grained gravel	1.14	<2.8		
3/30/2022	SP-3	SP3-SS-0322-SO-N		25.40	Silty sand with fine-grained gravel	1.15	<2.8		
3/30/2022	SP-4	SP4-SS-0322-SO-N		1.30	Sand with gravel	1.15	<2.8		
3/30/2022	SP-5	SP5-SS-0322-SO-N		1.90	Silty sand with fine-grained gravel	1.15	<2.8		
3/30/2022	SP-6	SP6-SS-0322-SO-N		149.10	Sand with gravel	1.14	<2.8		
Immunoassay Calibrator Data - Kit 5						1.14	NC		
						NA	<0.56		
						1.09	<2.8		
						NA	<16.8		

Table 3-1. Toxaphene Immunoassay Soil Sample Results

Date	Location ID	Sample ID	Arizona Residential Soil Remediation Level[1]			Toxaphene[3]			Comments
			Arizona Non-Residential Soil Remediation Level[2]			5.0			
			Depth (feet)	PID (ppmv)	Soil Description	16.0			
						Concentration (mg/kg)			
Toxaphene						Immunoassay		Laboratory	
						OD[4]	Result		
AOC No. 4 Soil Piles									
3/30/2022	SP-7	SP7-SS-0322-SO-N		2.30	Silty sand with fine-grained gravel	1.13	>2.8, <16.8		
3/30/2022	SP-8	SP8-SS-0322-SO-N		1.00	Sand with gravel	1.14	>2.8, <16.8	0.11	Immunoassay and laboratory results do not correlate; however, below RSRL.
3/30/2022	SP-9	SP9-SS-0322-SO-N		7.56	Silty sand with fine-grained gravel	0.63	>16.8	0.18	Immunoassay and laboratory results do not correlate; however, below RSRL.
3/30/2022	SP-10	SP10-SS-0322-SO-N		221.90	Sand with gravel	0.59	>16.8	0.11	Immunoassay and laboratory results do not correlate; however, below RSRL.
AOC No. 1									
3/30/2022	SB-1	SB1-SS-6-0330-SO-N		0.00	Fines with sand and fine-grained gravel	0.74	>16.8	0.59	Immunoassay and laboratory results do not correlate
3/30/2022	SB-1	SB1-SS-12-0330-SO-N		0.00	Fines with sand and fine-grained gravel	0.99	>16.8	0.17	Immunoassay and laboratory results do not correlate
3/29/2022	SB-2	SB2-SS-6-0329-SO-N	0.50	0.00	Sandy clay	0.72	**>16.8**	**260**	Immunoassay and laboratory results correlate
3/29/2022	SB-2	SB2-SS-12-0329-SO-N	1.00	0.30	Sandy clay	0.85	>16.8	4.0	Immunoassay and laboratory results do not correlate
3/29/2022	SB-3	SB3-SS-6"		0.00	Clayey sand with fine-grained gravel	1.13	>2.8, <16.8		
3/29/2022	SB-3	SB3-SS-12"		0.00	Clayey sand with fine-grained gravel	1.14	>2.8, <16.8		
3/29/2022	SB-4	SB4-SS-6"		0.60	Clay with sand and gravel	1.14	>2.8, <16.8		
3/29/2022	SB-4	SB4-SS-12"		0.00	Clay with sand	1.12	>2.8, <16.8		
3/29/2022	SB-5	SB5-SS-6-0329-SO-N	0.50	0.00	Clayey sand with gravel. Grass present in sample sleeve	0.94	>16.8	0.38	Immunoassay and laboratory results do not correlate; however, below RSRL
3/29/2022	SB-5	SB5-SS-12"		0.00	Sandy clay	1.14	>2.8, <16.8		
3/29/2022	SB-6	SB6-SS-6"		0.00	Clay with sand	1.14	>2.8, <16.8		
3/29/2022	SB-6	SB6-SS-12"		0.00	Clay with sand	1.15	>2.8, <16.8		
3/29/2022	SB-7	SB7-SS-6"		0.00	Clayey sand with fine-grained gravel	1.15	>2.8, <16.8		
Immunoassay Calibrator Data - Kit 6						1.17	NC		
						NA	<0.56		
						1.16	<2.8		
						1.07	<16.8		

Table 3-1. Toxaphene Immunoassay Soil Sample Results

Date	Location ID	Sample ID	Arizona Residential Soil Remediation Level[1]			Toxaphene[3]			
			Arizona Non-Residential Soil Remediation Level[2]			5.0			
			Depth (feet)	PID (ppmv)	Soil Description	16.0			Comments
Toxaphene						Concentration (mg/kg)			
						Immunoassay		Laboratory	
						OD[4]	Result		
AOC No. 1									
3/30/2022	SB-7	SB7-SS-12"	1.00	0.30	Clayey sand	1.12	<2.8		
3/30/2022	SB-8	SB8-SS-6"	0.50	0.00	Sany clay	1.06	***>2.8, <16.8***		
3/30/2022	SB-8	SB8-SS-12"	1.00	0.00	Sandy clay	1.13	<2.8		
3/30/2022	SB-9	SB9-SS-6-0330-SO-N	0.50	0.00	Clay	1.12	<2.8	2.0	Immunoassay and laboratory results correlate
3/30/2022	SB-9	SB9-SS-12-0330-SO-N	1.00	0.00	Clay	0.86	>16.8	4.5	Immunoassay and laboratory results do not correlate
3/30/2022	SB-10	SB10-SS-6-0330-SO-N	0.50	0.00	Sandy clay	1.04	>2.8, <16.8	4.8	Immunoassay and laboratory results correlate
3/30/2022	SB-10	SB10-SS-12"	1.00	0.00	Sandy clay	1.09	>2.8, <16.8		
3/30/2022	SB-11	SB11-SS-6"	0.50	0.00	Sandy clay	1.05	>2.8, <16.8		
3/30/2022	SB-11	SB11-SS-12"	1.00	0.00	Sandy clay	1.10	=2.8		
3/30/2022	SB-12	SB12-SS-6"	0.50	0.00	Clay with sand	1.04	**>2.8, <16.8**		
3/30/2022	SB-12	SB12-SS-12"	1.00	0.00	Clay with sand	1.07	**>2.8, <16.8**		
3/30/2022	SB-13	SB13-SS-6-0330-SO-N	0.50	0.00	Clay with sand	0.54	***>16.8***	***140***	Immunoassay and laboratory results correlate
3/30/2022	SB-13	SB13-SS-12"-0330-SO-N	1.00	0.00	Clay with sand	0.68	***>16.8***	***54***	Immunoassay and laboratory results correlate
3/30/2022	SB-14	SB14-SS-6-0330-SO-N	0.50	0.00	Clayey sand	0.84	***>16.8***	***57***	Immunoassay and laboratory results correlate
3/30/2022	SB-14	SB14-SS-12"	1.00	0.00	Clayey sand	1.10	=2.8		
3/30/2022	SB-15	SB15-SS-6-0330-SO-N	0.50	0.00	Clay	1.11	<2.8	4.3	Immunoassay and laboratory results do not correlate; however, below RSRL.
3/30/2022	SB-15	SB15-SS-12"	1.00	0.00	Sandy clay	1.14	<2.8		
Immunoassay Calibrator Data - Kit 7						1.14	NC		
						NA	<0.56		
						1.10	<2.8		
						1.00	<16.8		

Table 3-1. Toxaphene Immunoassay Soil Sample Results

Date	Location ID	Sample ID	Depth (feet)	PID (ppmv)	Soil Description	Toxaphene[3] Concentration (mg/kg) Immunoassay OD[4]	Toxaphene[3] Concentration (mg/kg) Immunoassay Result	Toxaphene[3] Concentration (mg/kg) Laboratory	Comments
Arizona Residential Soil Remediation Level[1]						5.0			
Arizona Non-Residential Soil Remediation Level[2]						16.0			
Toxaphene									
AOC No. 1									
3/30/2022	SB-16	SB16-SS-6"	0.50	0.00	Sandy clay with gravel	1.15	<2.8		
3/30/2022	SB-16	SB16-SS-12"	1.00	0.00	Sandy clay	1.11	>2.8, <16.8		
3/30/2022	SB-17	SB17-SS-6"	0.50	0.00	Sandy clay	1.11	>2.8, <16.8		
3/30/2022	SB-17	SB17-SS-12"	1.00	0.00	Sandy clay	1.13	>2.8, <16.8		
3/30/2022	SB-18	SB18-SS-6-0330-SO-N	0.50	0.00	Clayey sand	0.85	***>16.8***	***1100***	Immunoassay and laboratory results correlate
3/30/2022	SB-18	SB18-SS-12"	1.00	0.00	Clayey sand	1.02	***>2.8, <16.8***		
3/30/2022	SB-19	SB19-SS-6-0330-SO-N	0.50	0.00	Sandy clay	1.06	>2.8, <16.8	4.7	Immunoassay and laboratory results correlate
3/30/2022	SB-19	SB19-SS-12-0330-SO-N	1.00	0.00	Sandy clay	1.09	>2.8, <16.8	0.34	Immunoassay and laboratory results do not correlate; however, below RSRL
3/30/2022	SB-19	SB19-SS-6"	0.50	0.00	Sandy clay	1.11	>2.8, <16.8		Field duplicate of SB-9-6"
3/30/2022	SB-19	SB19-SS-12" (DUP01)	1.00	0.00	Sandy clay	1.06	>2.8, <16.8	1.0	Field duplicate of SB-19-12". Immunoassay and laboratory results do not correlate; however, below RSRL
AOC No. 4									
3/30/2022	SB-20	SB20-SS-6"	0.50	0.00	Sandy clay	1.15	<2.8		
3/30/2022	SB-20	SB20-SS-12"	1.00	0.00	Sandy clay	1.13	***>2.8, <16.8***		
3/30/2022	SB-21	SB21-SS-6"	0.50	0.00	Sandy clay	1.02	***>2.8, <16.8***		
3/30/2022	SB-21	SB21-SS-12-0330-SO-N	1.00	0.00	Sandy clay	0.69	***>16.8***	***160***	Immunoassay and laboratory results correlate
3/31/2022	SB-22	SB22-SS-6-0331-SO-N	0.50	0.00	Clay with sand	0.94	>16.8	1.1	Immunoassay and laboratory results do not correlate
3/31/2022	SB-22	SB22-SS-12" (DUP-2-0331-SO-FR)	1.00	0.00	Sandy clay	1.06	>2.8, <16.8	1.0	Immunoassay and laboratory results do not correlate; however, below RSRL
3/31/2022	SB-22	SB22-SS-6"	0.50	0.00	Sandy clay	0.90	>16.8		Field duplicate of SB22-SS-6"
Immunoassay Calibrator Data - Kit 8						1.15	NC		
						NA	<0.56		
						1.14	<2.8		
						1.00	<16.8		

Table 3-1. Toxaphene Immunoassay Soil Sample Results

Date	Location ID	Sample ID	Arizona Residential Soil Remediation Level[1]			Toxaphene[3]			Comments
			Arizona Non-Residential Soil Remediation Level[2]			5.0			
			Depth (feet)	PID (ppmv)	Soil Description	16.0			
						Concentration (mg/kg)			
Toxaphene						Immunoassay		Laboratory	
						OD[4]	Result		
AOC No. 4									
3/31/2022	SB-22	SB22-SS-12-0331-SO-N	1.00	0.00	Sandy clay	1.13	<2.8	<0.019	Immunoassay and laboratory results correlate
3/31/2022	SB-23	SB23-SS-6"	0.50	0.00	Sandy clay with fine-grained gravel	1.14	<2.8		
3/31/2022	SB-23	SB23-SS-12"	1.00	0.00	Sandy clay with fine-grained gravel	1.15	<2.8		
3/31/2022	SB-24	SB24-SS-6"	0.50	0.00	Clayey sand with fine-grained gravel	1.14	<2.8		
3/31/2022	SB-24	SB24-SS-12"	1.00	0.00	Clayey sand with fine-grained gravel	1.08	***>2.8, <16.8***		
3/31/2022	SB-25	SB25-SS-6"	0.50	0.00	Clayey sand with fine-grained gravel	1.13	***<2.8***		
3/31/2022	SB-25	SB25-SS-12"	1.00	0.00	Clayey sand	1.07	***>2.8, <16.8***		
3/31/2022	SB-26	SB26-SS-6-0331-SO-N	0.50	0.00	Sandy clay	0.41	***>16.8***	***30***	Immunoassay and laboratory results correlate
3/31/2022	SB-26	SB26-SS-12"	1.00	0.00	Clayey sand	1.00	***>2.8, <16.8***		
3/31/2022	SB-27	SB27-SS-6-0331-SO-N	0.50	0.00	Sandy clay	1.10	=2.8	1.4	Immunoassay and laboratory results do not correlate; however, below RSRL.
3/31/2022	SB-27	SB27-SS-12"	1.00	0.00	Sandy clay	1.08	>2.8, <16.8		
AOC No. 3 Test Pits									
3/28/2022	TP-09	TP9-SS-10-0328-SO-N	10.00			1.08	**>2.8, <16.8**		
3/28/2022	TP-04	TP4-SS-10-0328-SO-N	10.00			1.01	**=16.8**	3.3	Immunoassay and laboratory results do not correlate
3/29/2022	TP-10	TP10-SS-0'-0329-SO-N	0.00			0.64	***>16.8***		
3/28/2022	TP-07	TP7-SS-10'-0328-SO-N	10.00			1.01	**=16.8**	**18**	Immunoassay and laboratory results correlate
3/28/2022	TP-05	TP5-SS-10-0328-SO-N	10.00			1.11	<2.8, >NC		
3/29/2022	TP-03	TP3-SS-10-0329-SO-N	10.00			0.67	**>16.8**	**620**	Immunoassay and laboratory results correlate
Immunoassay Calibrator Data - Kit 9						1.13	NC		
						NA	<0.56		
						1.10	<2.8		
						1.01	<16.8		

Table 3-1. Toxaphene Immunoassay Soil Sample Results

Date	Location ID	Sample ID	Depth (feet)	PID (ppmv)	Soil Description	Toxaphene[3] Concentration (mg/kg) Immunoassay OD[4]	Toxaphene[3] Concentration (mg/kg) Immunoassay Result	Toxaphene[3] Concentration (mg/kg) Laboratory	Comments
Arizona Residential Soil Remediation Level[1]						**5.0**			
Arizona Non-Residential Soil Remediation Level[2]						**16.0**			
Toxaphene									
AOC No. 3 Test Pits									
3/29/2022	TP-10	TP10-SS-10'-0329-SO-N	10.00			1.16	**>2.8, <16.8**		
3/29/2022	TP-02	TP2-SS-5'-0329-SO-N	5.00			1.14	**>2.8, <16.8**		
3/29/2022	TP-02	TP2-SS-0'-0329-SO-N	0.00			0.95	***>16.8***		
3/29/2022	TP-06	TP6-SS-0'-0329-SO-N	0.00			1.10	***>16.8***		
3/29/2022	TP-06	TP6-SS-10'-0329-SO-N	10.00			1.16	>2.8, <16.8	1.0	Immunoassay and laboratory results do not correlate; however, below RSRL.
3/29/2022	TP-01	TP1-SS-0'-0329-SO-N	0.00			0.87	***>16.8***		
3/29/2022	TP-01	TP1-SS-6'-0329-SO-N	6.00			0.98	**>16.8**		
3/28/2022	TP-04	TP4-SS-0'-0328-SO-N	0.00			1.16	***>2.8, <16.8***		
3/28/2022	TP-04	TP4-SS-5'-0328-SO-N	5.00			1.15	>2.8, <16.8		
3/28/2022	TP-07	TP7-SS-0'-0328-SO-N	0.00			1.15	***>2.8, <16.8***		
3/29/2022	TP-08	TP8-SS-10'-0329-SO-N	10.00			1.17	=2.8	0.18	Immunoassay and laboratory results do not correlate; however, below RSRL.
3/30/2022	SB-13	SB13-SS-18-0330-SO-N	1.50	0.00	Sandy clay	1.00	**>16.8**		
3/30/2022	SB-13	SB13-SS-24-0330-SO-N	2.00	0.00	Sandy clay	1.13	=16.8	3.6	Immunoassay and laboratory results do not correlate; however, below RSRL
3/30/2022	SB-09	SB9-SS-6-18-0330-SO-N	1.50	0.00	Clayey sand	1.16	>2.8, <16.8		
3/30/2022	SB-09	SB9-SS-24-0330-SO-N	2.00	0.00	Clayey sand	1.17	=2.8	<0.099	Immunoassay and laboratory results do not correlate; however, below RSRL.
Immunoassay Calibrator Data - Kit 10						1.18	NC		
						NA	<0.56		
Immunoassay Calibrator Data - Kit 11						1.17	<2.8		
						NA	<16.8		

Notes:

1. Arizona 10^{-5} Residential Soil Remediation Level (RSRL)
2. Arizona Non-Residential Soil Remediation Level (NRSRL)
3. Results reported in milligrams per kilogram (mg/kg).
4. Immunoassay sample Optical Density (OD). OD is compared to calibrator data to obtain concentration. NC indicates negative control and NA indicates not analyzed.

Results bolded and shaded indicate concentration exceeds RSRL

Results *bolded* and shaded indicate concentration exceeds NRSRL

Table 3-2
SUMMARY OF SOIL SAMPLE LABORATORY ANALYTICAL DATA - PESTICIDES
Former KK Aerial Applicator Site
Chandler Municipal Airport

Soil Sample ID	Date	Sample Depth (feet below ground surface)	PESTICIDES - EPA Method 8080 or 8081A (mg/kg)						
			Toxaphene	4,4-DDE	4,4-DDT	Alpha-BHC	Beta-BHC	Gamma-BHC (Lindane)	Dieldrin
rSRL			**5**	**20**	**20**	**1.0**	**3.6**	**5.0**	**0.34**
nrSRL			**16**	**70**	**70**	**3.6**	**13**	**17**	**1.1**
Soil Borings									
RW Beck/Dames & Moore 1991 On-Site Soil Samples									
KK-9	1991	0-6"	**120**	**32**	NA	NA	NA	NA	NA
KK-13	1991	0-6"	**190**	18	16.1	NA	NA	NA	NA
KK-14	1991	0-6"	**960**	**63**	**160**	NA	NA	NA	NA
KK-15	1991	0-6"	**850**	**37**	**150**	NA	NA	NA	NA
KK-15	1991	0-8"	**45**	4.9	8.8	NA	NA	NA	NA
KK-15	1991	8"-16"	0.78	0.045	0.137	NA	NA	NA	NA
KK-15	1991	1.5'-2'	0.123	0.005	0.029	NA	NA	NA	NA
KK-15	1991	4.5'-5'	<0.0015	0.002	0.002	NA	NA	NA	NA
KK-15	1991	14.5'-15'	<0.0015	0.002	0.002	NA	NA	NA	NA
KK-16	1991	0-6"	**53**	16	12	NA	NA	NA	NA
KK-16	1991	8"-10"	**22**	2.7	NA	NA	NA	NA	NA
KK-17	1991	0-6"	**86**	4.6	NA	NA	NA	NA	NA
KK-18	1991	0-6"	**160**	9.9	4.2	NA	NA	NA	NA
KK-19	1991	0-6"	**24**	NA	NA	NA	NA	NA	NA
KK-20	1991	0-6"	2.7	NA	NA	NA	NA	NA	NA
RW Beck/Dames & Moore 1991 Off-Site Vertical Extent Soil Samples									
KK-3	1991	0-6"	**130**	**24**	NA	NA	NA	NA	NA
KK-3	1991	0-8"	**8.8**	**0.331**	**0.183**	NA	NA	NA	NA
KK-3	1991	8"-16"	**1.01**	**0.183**	**0.331**	NA	NA	NA	NA
KK-3	1991	1.5'-2'	**0.092**	**0.048**	**0.027**	NA	NA	NA	NA
KK-3	1991	4.5'-5'	<0.0015	<0.005	**0.014**	NA	NA	NA	NA
KK-3	1991	14.5'-15'	<0.0015	<0.005	**0.005**	NA	NA	NA	NA
KK-5	1991	0-6"	**110**	**36**	NA	NA	NA	NA	NA
KK-5	1991	0-8"	**331**	**81**	**108**	NA	NA	NA	NA
KK-5	1991	8"-16"	**15**	**4.7**	**2.3**	NA	NA	NA	NA
KK-5	1991	1.5'-2'	**135**	**41**	**41**	NA	NA	NA	NA
KK-5	1991	4.5'-5'	**2.2**	**0.307**	**0.702**	NA	NA	NA	NA
KK-5	1991	14.5'-15'	<0.0015	**0.017**	**0.024**	NA	NA	NA	NA
KK-11	1991	0-6"	**67**	**10**	**11**	NA	NA	NA	NA
KK-11	1991	0-8"	**9.1**	**2.06**	**1.59**	NA	NA	NA	NA
KK-11	1991	8"-16"	**1.02**	**0.183**	**0.208**	NA	NA	NA	NA
KK-11	1991	1.5'-2'	<0.0015	**0.007**	**0.009**	NA	NA	NA	NA
KK-11	1991	4.5'-5'	<0.0015	<0.001	**0.003**	NA	NA	NA	NA
KK-11	1991	14.5'-15'	<0.0015	<0.004	**0.01**	NA	NA	NA	NA
KK-12	1991	0-6"	**5300**	**780**	**920**	NA	NA	NA	NA
KK-12	1991	0-8"	NA	NA	NA	NA	NA	NA	NA
KK-12	1991	8"-16"	**188**	**27**	**322**	NA	NA	NA	NA
KK-12	1991	1.5'-2'	**3.5**	**9.3**	**6.6**	NA	NA	NA	NA
KK-12	1991	4.5'-5'	<0.0015	**0.01**	**0.074**	NA	NA	NA	NA
KK-12	1991	14.5'-15'	<0.0015	<0.004	**0.011**	NA	NA	NA	NA
KK-12	1991	19.5'-20'	<0.0015	<0.004	**0.009**	NA	NA	NA	NA
KK-12	1991	29.5'-30'	<0.0015	<0.001	<0.001	NA	NA	NA	NA
WSP EE/CA Investigation									

Table 3-2
SUMMARY OF SOIL SAMPLE LABORATORY ANALYTICAL DATA - PESTICIDES
Former KK Aerial Applicator Site
Chandler Municipal Airport

Soil Sample ID	Date	Sample Depth (feet below ground surface)	PESTICIDES - EPA Method 8080 or 8081A (mg/kg)						
			Toxaphene	4,4-DDE	4,4-DDT	Alpha-BHC	Beta-BHC	Gamma-BHC (Lindane)	Dieldrin
rSRL			**5**	**20**	**20**	**1.0**	**3.6**	**5.0**	**0.34**
nrSRL			**16**	**70**	**70**	**3.6**	**13**	**17**	**1.1**
SB1-SS-6-0330-SO-N	03/30/2022	0.5	**0.59**	**0.11**	**0.035**	<0.005	<0.005	<0.005	<0.005
SB1-SS-12-0330-SO-N	03/30/2022	1	**0.17**	**0.027**	<0.005	<0.005	<0.005	<0.005	<0.005
SB2-SS-6-0329-SO-N	03/29/2022	0.5	**260**	**1.2**	**0.45**	<0.0049	**0.11**	<0.0049	<0.0049
SB2-SS-12-0329-SO-N	03/29/2022	1	**4.0**	**1.2**	**0.54**	<0.0049	**0.03**	<0.0049	<0.0049
SB5-SS-6-0329-SO-N	03/29/2022	0.5	**0.38**	**0.043**	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049
SB9-SS-6-0330-SO-N	03/30/2022	0.5	**2.0**	**0.039**	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049
SB9-SS-12-0330-SO-N	03/30/2022	1	**4.5**	**0.13**	<0.005	<0.005	**0.0026**	<0.005	<0.005
SB9-SS-24-0330-SO-N	03/30/2022	2	<0.099	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049
SB10-SS-6-0330-SO-N	03/30/2022	0.5	**4.8**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SB13-SS-6-0330-SO-N	03/30/2022	0.5	**140**	**19**	**110**	**0.18**	**0.88**	**0.30**	<0.005
SB13-SS-12-0330-SO-N	03/30/2022	1	**54**	**7.0**	**39**	**0.14**	**0.67**	**0.22**	<0.005
SB13-SS-24-0330-SO-N	03/30/2022	2	**3.6**	**0.43**	**1.1**	**0.0028**	**0.09**	**0.0047**	<0.005
SB14-SS-6-0330-SO-N	3/30/2022	0.5	**57**	**13**	**4.3**	<0.005	**0.045**	<0.005	<0.005
SB15-SS-6-0330-SO-N	3/30/2022	0.5	**4.3**	**0.33**	**0.10**	<0.005	<0.005	<0.005	<0.005
SB18-SS-6-0330-SO-N	3/30/2022	0.5	**1100**	**57**	**17**	<0.5	<0.5	<0.5	<0.5
SB19-SS-6-0330-SO-N	3/30/2022	0.5	**4.7**	**0.29**	<0.005	<0.005	**0.0084**	<0.005	<0.005
SB19-SS-12-0330-SO-N	3/30/2022	1	**0.34**	**0.0058**	**0.0074**	<0.0049	**0.0240**	<0.0049	<0.0049
DUP-1-0330-SO-FR	3/30/2022	1	**4.1**	**0.27**	**0.074**	<0.0049	**0.0053**	<0.0049	<0.0049
SB21-SS-12-0330-SO-N	3/30/2022	1	**160**	**1.1**	<0.005	<0.005	**0.0099**	<0.005	<0.005
SB22-SS-6-0331-SO-N	3/31/2022	0.5	**1.1**	**0.071**	**0.036**	<0.0049	**0.028**	<0.0049	<0.0049
SB22-SS-12-0331-SO-N	3/31/2022	1	<0.10	**0.015**	<0.005	<0.005	**0.0077**	<0.005	<0.005
DUP-2-0331-SO-FR	3/31/2022	1	**1.0**	**0.063**	**0.031**	<0.0049	**0.031**	<0.0049	<0.0049
SB26-SS-6-0331-SO-N	3/31/2022	0.5	**30**	**0.47**	<0.025	<0.005	**0.0044**	<0.005	<0.005
SB27-SS-6-0331-SO-N	3/31/2022	0.5	**1.4**	**0.029**	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049
SB28-SS-6"-0329-SO-N	3/29/2022	0.5	**0.59**	**0.023**	**0.013**	<0.005	<0.005	<0.005	<0.005
SB30-SS-6"-0328-SO-N	3/28/2022	0.5	**11**	**0.39**	<0.005	<0.005	<0.005	<0.005	<0.005
SB32-SS-6"-0328-SO-N	3/28/2022	0.5	**24**	**1.0**	<0.005	<0.005	<0.005	<0.005	<0.005
SB34-SS-6"-0328-SO-N	3/28/2022	0.5	**97**	**1.2**	<0.005	<0.005	<0.005	<0.005	<0.005
SB37-SS-6"-0328-SO-N	3/28/2022	0.5	**0.088**	**0.0057**	<0.005	<0.005	<0.005	<0.005	<0.005
SB39-SS-6"-0329-SO-N	03/29/2022	0.5	**6.9**	**0.078**	<0.005	<0.005	<0.005	<0.005	<0.005
SB44-SS-6"-0329-SO-N	03/29/2022	0.5	**1.9**	**0.73**	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049
SB46-SS-12"-0329-SO-N	03/29/2022	1	**2.8**	**0.02**	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049
SB47-SS-12"-0329-SO-N	03/29/2022	1	**0.70**	**0.0071**	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049
SB53-SS-6"-0329-SO-N	03/29/2022	0.5	**16**	**0.60**	<0.005	<0.005	<0.005	<0.005	<0.005
SB55-SS-6"-0328-SO-N	3/28/2022	0.5	**56**	**1.6**	<0.12	<0.12	<0.12	<0.12	<0.12
SB57-SS-6"-0328-SO-N	3/28/2022	0.5	**5.6**	**0.66**	**0.25**	<0.05	<0.05	<0.05	<0.05
SB61-SS-6"-0328-SO-N	3/28/2022	0.5	<2.0	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099
SB62-SS-6"-0328-SO-N	3/28/2022	0.5	**8.4**	**0.59**	**0.31**	<0.005	<0.005	<0.005	<0.005
SB63-SS-6"-0328-SO-N	3/28/2022	0.5	**14**	**0.11**	**0.063**	<0.05	<0.05	<0.05	<0.05
SB65-SS-12-0328-SO-N	3/28/2022	1	**1.5**	**0.11**	**0.063**	<0.05	<0.05	<0.05	<0.05
SB67-SS-12"-0328-SO-N	3/28/2022	1	**17**	**5.5**	**0.70**	**0.0056**	<0.0049	<0.0049	<0.0049
SB69-SS-12"-0328-SO-N	3/28/2022	1	**2.5**	**0.072**	**0.17**	<0.0049	<0.0049	<0.0049	<0.0049
SB70-SS-6"-0328-SO-N	3/28/2022	0.5	**5.0**	**0.85**	**0.14**	<0.0049	<0.0049	<0.0049	<0.0049
SB71-SS-6"-0328-SO-N	3/28/2022	0.5	**7.8**	**1.3**	**0.24**	<0.005	<0.005	<0.005	<0.005
AOC 4 Soil Piles									
SP1-SS-113023-SO-N	11/30/2023		<0.400	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
SP2-SS-113023-SO-N	11/30/2023		<0.400	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
SP3-SS-113023-SO-N	11/30/2023		<0.400	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
SP4-SS-113023-SO-N	11/30/2023		**1.07**	**0.0281**	<0.020	<0.020	<0.020	<0.020	<0.020
SP5-SS-113023-SO-N	11/30/2023		<0.400	**0.0302**	<0.020	<0.020	<0.020	<0.020	<0.020
SP6-SS-113023-SO-N	11/30/2023		<0.400	**0.0617**	<0.020	<0.020	<0.020	<0.020	<0.020
SP7-SS-113023-SO-N	11/30/2023		<0.400	**0.0445**	<0.020	<0.020	<0.020	<0.020	<0.020
SP8-SS-0303-SO-N	03/30/2022		**0.11**	**0.0043**	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049
SP9-SS-0303-SO-N	03/30/2022		**0.18**	**0.065**	<0.005	<0.005	<0.005	<0.005	<0.005
SP10-SS-0303-SO-N	03/30/2022		**0.11**	**0.027**	<0.005	<0.005	<0.005	<0.005	<0.005
SP11-SS-113023-SO-N	11/30/2023		<0.400	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
SP12-SS-113023-SO-N	11/30/2023		<0.400	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
SP13-SS-113023-SO-N	11/30/2023		<0.400	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
SP14-SS-113023-SO-N	11/30/2023		<0.400	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
SP15-SS-113023-SO-N	11/30/2023		<0.400	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020

Table 3-2
SUMMARY OF SOIL SAMPLE LABORATORY ANALYTICAL DATA - PESTICIDES
Former KK Aerial Applicator Site
Chandler Municipal Airport

Soil Sample ID	Date	Sample Depth (feet below ground surface)	PESTICIDES - EPA Method 8080 or 8081A (mg/kg)						
			Toxaphene	4,4-DDE	4,4-DDT	Alpha-BHC	Beta-BHC	Gamma-BHC (Lindane)	Dieldrin
rSRL			**5**	**20**	**20**	**1.0**	**3.6**	**5.0**	**0.34**
nrSRL			**16**	**70**	**70**	**3.6**	**13**	**17**	**1.1**
AOC 4 Soil Piles									
SP16-SS-113023-SO-N	11/30/2023		<0.400	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
SP17-SS-113023-SO-N	11/30/2023		<0.400	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
SP19-SS-113023-SO-N	11/30/2023		<0.400	**0.0536**	<0.020	<0.020	<0.020	<0.020	<0.020
SP20-SS-113023-SO-N	11/30/2023		<0.400	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
SP21-SS-113023-SO-N	11/30/2023		<0.400	**0.669**	<0.020	<0.020	<0.020	<0.020	<0.020
SP22-SS-113023-SO-N	11/30/2023		<0.400	**0.0231**	<0.020	<0.020	<0.020	<0.020	<0.020
SP23-SS-113023-SO-N	11/30/2023		<0.400	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
SP24-SS-113023-SO-N	11/30/2023		<0.400	**0.0718**	<0.020	<0.020	<0.020	<0.020	<0.020
AOC 3 Landfill Test Pits									
TP3-SS-10'-0329-SO-N	3/29/2022	10	**620**	**15**	**160**	<0.05	<0.05	<0.05	<0.05
TP4-SS-10'-0329-SO-N	3/29/2022	10	**3.3**	**0.014**	<0.005	<0.005	<0.005	<0.005	<0.005
TP6-SS-10'-0329-SO-N	3/29/2022	10	**1.0**	**0.023**	**0.021**	<0.005	<0.005	<0.005	<0.0049
TP7-SS-10'-0329-SO-N	3/29/2022	10	**18**	**1.0**	**2.3**	<0.005	<0.005	<0.005	<0.0049

Notes:
<0.00600 - Indicates analyte not present above laboratory reporting limit of 0.00600 mg/kg
BOLD Indicates analyte is present
BOLD YELLOW - Indicates analyte is present in concentrations equal to or exceeding ADEQ rSRL
BOLD ORANGE **-** Indicates analyte is present in concentrations equal to or exceeding ADEQ nrSRL
ADEQ - Arizona Department of Environmental Quality
bgs - Below ground surface
EPA - United States Environmental Protection Agency
ID - Identification
mg/kg - milligrams per kilogram
NE - Not Established
rRSL- ADEQ Residential Soil Remediation Level
nrSRL - ADEQ Non-Residential Soil Remediation Level

Table 3-3
SUMMARY OF SOIL SAMPLE LABORATORY ANALYTICAL DATA - PAH
Former KK Aerial Applicator Site
Chandler Municipal Airport

Soil Sample ID	Date	Sample Depth (feet below ground surface)	Polynuclear Aromatic Hydrocarbons - EPA Method 8270 SIM (mg/kg)												
			Anthracene	Acenaphthene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Pyrene
rSRL			**22,000**	**3,700**	**0.69**	**0.069**	**0.69**	**6.9**	**68**	**0.069**	**2,300**	**2,700**	**0.69**	**56**	**2,300**
nrSRL			**240,000**	**29,000**	**21**	**2.1**	**21**	**210**	**2,000**	**2.1**	**22,000**	**26,000**	**21**	**190**	**29,000**
Soil Borings															
SB1-SS-6-0330-SO-N	03/30/2022	0.5	<0.0037	<0.0037	<0.0037	<0.0037	**0.0013**	**0.0011**	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
SB1-SS-12-0330-SO-N	03/30/2022	1	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
SB2-SS-6-0329-SO-N	03/29/2022	0.5	<0.0037	<0.0037	**0.0058**	**0.0020**	**0.0035**	**0.0013**	<0.0037	<0.0037	**0.0034**	<0.0037	NA	<0.0037	<0.0037
SB2-SS-12-0329-SO-N	03/29/2022	1	<0.0037	<0.0037	<0.0037	**0.0026**	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
SB5-SS-6-0329-SO-N	03/29/2022	0.5	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	NA	<0.0038	<0.0038
SB9-SS-12-0330-SO-N	03/30/2022	1	**0.0010**	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	**0.010**	<0.0037	NA	<0.0037	<0.0037
SB13-SS-6-0330-SO-N	03/30/2022	0.5	<0.0037	<0.0037	<0.0037	**0.0014**	**0.0025**	<0.0037	**0.0020**	<0.0037	**0.0017**	<0.0037	NA	<0.0037	**0.0016**
SB13-SS-12-0330-SO-N	03/30/2022	1	**0.00079**	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	**0.0046**	<0.0037	NA	<0.0037	**0.0040**
SB13-SS-24-0330-SO-N	03/30/2022	2	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
SB14-SS-6-0330-SO-N	3/30/2022	0.5	**0.00095**	<0.0037	<0.0037	**0.00075**	**0.0043**	**0.0011**	<0.0037	<0.0037	**0.0013**	<0.0037	NA	<0.0037	<0.0037
SB18-SS-6-0330-SO-N	3/30/2022	0.5	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
SB19-SS-6-0330-SO-N	3/30/2022	0.5	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
SB19-SS-12-0330-SO-N	3/30/2022	12	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
DUP-1-0330-SO-FR	3/30/2022	12	<0.0037	<0.0037	<0.0037	**0.0016**	**0.0034**	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
SB21-SS-12-0330-SO-N	3/30/2022	12	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
SB22-SS-6-0331-SO-N	3/31/2022	0.5	<0.0037	<0.0037	**0.0028**	**0.0044**	**0.0083**	**0.0028**	**0.0054**	<0.0037	**0.0068**	<0.0037	NA	<0.0037	**0.0056**
SB22-SS-12-0331-SO-N	3/31/2022	1	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
DUP-2-0331-SO-FR	3/31/2022	1	<0.0037	<0.0037	**0.0040**	**0.0042**	**0.0086**	**0.0031**	**0.0054**	<0.0037	**0.0095**	<0.0037	NA	<0.0037	**0.0080**
SB26-SS-6-0331-SO-N	3/31/2022	0.5	<0.0037	<0.0037	**0.0021**	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
SB39-SS-6"-0329-SS-N	03/29/2022	0.5	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	**0.001**	<0.0037	NA	<0.0037	<0.0037
SB44-SS-6"-0329-SO-N	03/29/2022	0.5	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	**0.010**	<0.0037	NA	<0.0037	**0.007**
SB46-SS-12"-0329-SO-N	03/29/2022	1	<0.0037	<0.0037	<0.0037	**0.001**	**0.003**	<0.0037	<0.0037	<0.0037	**0.002**	<0.0037	NA	<0.0037	**0.002**
SB47-SS-12"-0329-SO-N	03/29/2022	1	**0.001**	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	**0.004**	<0.0037	NA	**0.002**	**0.004**
SB53-SS-6"-0329-SO-N	03/29/2022	0.5	**0.001**	<0.0037	<0.0037	**0.001**	**0.005**	<0.0037	<0.0037	<0.0037	**0.001**	<0.0037	NA	<0.0037	<0.0037
AOC 4 Soil Piles															
SP1-SS-0303-SO-N	03/30/2022		<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
SP2-SS-0303-SO-N	03/30/2022		<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
SP3-SS-0303-SO-N	03/30/2022		<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
SP4-SS-0303-SO-N	03/30/2022		<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
SP5-SS-0303-SO-N	03/30/2022		<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
SP6-SS-0303-SO-N	03/30/2022		<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
SP7-SS-0303-SO-N	03/30/2022		<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
SP8-SS-0303-SO-N	03/30/2022		<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
SP9-SS-0303-SO-N	03/30/2022		<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
SP10-SS-0303-SO-N	03/30/2022		<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
SP11-SS-0303-SO-N	03/30/2022		<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
SP12-SS-0303-SO-N	03/30/2022		<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
SP13-SS-0303-SO-N	03/30/2022		<0.0037	<0.0037	<0.0037	**0.001**	**0.001**	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
SP14-SS-0303-SO-N	03/30/2022		<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
SP15-SS-0303-SO-N	03/30/2022		<0.0037	<0.0037	**0.008**	**0.007**	**0.010**	**0.004**	<0.0037	**0.001**	**0.009**	<0.0037	NA	<0.0037	**0.008**
SP16-SS-0303-SO-N	03/30/2022		<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
SP17-SS-0303-SO-N	03/30/2022		<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037

Table 3-3
SUMMARY OF SOIL SAMPLE LABORATORY ANALYTICAL DATA - PAH
Former KK Aerial Applicator Site
Chandler Municipal Airport

Soil Sample ID	Date	Sample Depth (feet below ground surface)	Polynuclear Aromatic Hydrocarbons - EPA Method 8270 SIM (mg/kg)												
			Anthracene	Acenaphthene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Pyrene
rSRL			**22,000**	**3,700**	**0.69**	**0.069**	**0.69**	**6.9**	**68**	**0.069**	**2,300**	**2,700**	**0.69**	**56**	**2,300**
nrSRL			**240,000**	**29,000**	**21**	**2.1**	**21**	**210**	**2,000**	**2.1**	**22,000**	**26,000**	**21**	**190**	**29,000**
SP18-SS-0303-SO-N	03/30/2022		<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
SP19-SS-0303-SO-N	03/30/2022		<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
SP20-SS-0303-SO-N	03/30/2022		<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
SP21-SS-0303-SO-N	03/30/2022		<0.0037	<0.0037	**0.003**	**0.005**	**0.004**	**0.001**	**0.005**	<0.0037	**0.002**	<0.0037	NA	<0.0037	**0.004**
AOC 3 Landfill Test Pits															
TP10-SS-0'-0329-SO-N	03/29/2022		<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
TP10-SS-10'-0329-SO-N	03/29/2022		<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
TP1-SS-0'-0329-SO-N	03/29/2022		<0.0037	<0.0037	**0.0031**	**0.0048**	**0.0086**	**0.0031**	**0.0059**	0.0013	**0.0084**	<0.0037	NA	<0.0037	**0.0078**
TP1-SS-6'-0329-SO-N	03/29/2022		<0.0037	<0.0037	**0.0019**	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
TP2-SS-0'-0329-SO-N	03/29/2022		<0.0037	<0.0037	**0.0041**	**0.0077**	**0.013**	**0.0047**	**0.0065**	0.0018	**0.0067**	<0.0037	NA	<0.0037	**0.0065**
TP2-SS-5'-0329-SO-N	03/29/2022		<0.0037	<0.0037	**0.0051**	**0.0091**	**0.0098**	**0.0041**	**0.0061**	0.0018	**0.0051**	<0.0037	NA	<0.0037	**0.0062**
TP3-SS-10'-0329-SO-N	03/29/2022		<0.037	<0.037	**0.012**	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	NA	<0.037	<0.037
TP4-SS-0'-0328-SO-N	03/28/2022		<0.037	<0.037	**0.023**	**0.046**	**0.045**	**0.019**	**0.029**	0.0075	**0.021**	<0.037	NA	<0.037	**0.025**
TP4-SS-10'-0328-SO-N	03/28/2022		<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
TP4-SS-5'-0328-SO-N	03/28/2022		<0.037	<0.037	<0.037	<0.037	**0.011**	<0.037	<0.037	<0.037	<0.037	<0.037	NA	<0.037	<0.037
TP5-SS-10'-0328-SO-N	03/28/2022		<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
TP6-SS-0'-0329-SO-N	03/29/2022		<0.037	0.011	**0.061**	**0.09**	**0.1**	**0.045**	**0.067**	0.018	**0.13**	<0.037	NA	<0.037	**0.12**
TP6-SS-10'-0329-SO-N	03/29/2022		<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
TP7-SS-0-0328-SO-N	03/28/2022		<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	NA	<0.037	<0.037
TP7-SS-10'-0328-SO-N	03/28/2022		<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	NA	<0.037	<0.037
TP8-SS-10'-0329-SO-N	03/29/2022		<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	NA	<0.0037	<0.0037
TP9-SS-10'-0328-SO-N	03/28/2022		<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	NA	<0.037	<0.037

Notes:
<0.00600 - Indicates analyte not present above laboratory reporting limit of 0.00600 mg/kg
BOLD Indicates analyte is present in concentrations greater than laboratory reporting limit
BOLD YELLOW - Indicates analyte is present in concentrations equal to or exceeding ADEQ rSRL
BOLD ORANGE - Indicates analyte is present in concentrations equal to or exceeding ADEQ nrSRL
ADEQ - Arizona Department of Environmental Quality
bgs - Below ground surface
EPA - United States Environmental Protection Agency
ID - Identification
mg/kg - milligrams per kilogram
NE - Not Established
PAH - Polynuclear Aromatic Hydrocarbons
rRSL- ADEQ Residential Soil Remediation Level
nrSRL - ADEQ Non-Residential Soil Remediation Level

Table 3-4
SUMMARY OF SOIL SAMPLE LABORATORY ANALYTICAL DATA - METALS
Former KK Aerial Applicator Site
Chandler Municipal Airport

Soil Sample ID	Metals - EPA Method 6010/7470 (mg/kg)							
	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
rSRL	**10**	**15,000**	**39**	**120,000**	**400**	**23**	**390**	**390**
nrSRL	**10**	**170,000**	**510**	**1,000,000**	**800**	**310**	**5,100**	**5,100**
GPL	**290**	**12,000**	**29**	**590**	**290**	**12**	**290**	**NE**
Soil Borings								
SB1-SS-12-0330-SO-N	**3.1**	**160**	<0.042	**16**	**13**	<0.097	<0.25	<0.012
SB1-SS-6-0330-SO-N	**2.7**	**130**	0.046	**13**	**13**	<0.089	<0.24	<0.012
SB13-SS-6-0330-SO-N	**11**	**110**	**3.4**	**18**	**61**	<0.096	<0.25	<0.012
SB14-SS-6-0330-SO-N	**9.6**	**83**	**0.45**	**21**	**23**	<0.087	<0.25	<0.012
SB5-SS-6-0329-SO-N	**3.1**	**150**	<0.042	**13**	**11**	<0.095	**0.39**	<0.012
SB9-SS-12-0330-SO-N	**5.2**	**160**	<0.042	**17**	**16**	<0.099	<0.24	<0.012
AOC-4 Soil Piles								
SP1-SS-0303-SO-N	**3.6**	**99**	**0.067**	**15**	**13**	<0.096	<0.25	<0.012
SP2-SS-0303-SO-N	**3.1**	**110**	<0.042	**14**	**12**	<0.099	<0.24	<0.012
SP3-SS-0303-SO-N	**2.7**	**120**	<0.042	**14**	**11**	<0.098	<0.25	<0.012
SP4-SS-0303-SO-N	**2.9**	**130**	<0.042	**14**	**12**	<0.093	<0.24	<0.012
SP5-SS-0303-SO-N	**2.5**	**120**	<0.042	**15**	**15**	<0.093	<0.24	<0.012
SP6-SS-0303-SO-N	**1.9**	**91**	<0.042	**11**	**11**	<0.095	<0.25	<0.012
SP7-SS-0303-SO-N	**3.1**	**130**	<0.042	**14**	**14**	<0.096	<0.24	<0.012
SP8-SS-0303-SO-N	**2.8**	**140**	<0.042	**14**	**14**	<0.097	<0.24	<0.012
SP9-SS-0303-SO-N	**2.6**	**110**	**0.045**	**16**	**14**	<0.091	<0.24	<0.012
SP10-SS-0303-SO-N	**2.4**	**99**	<0.042	**14**	**13**	<0.089	<0.24	<0.012
SP11-SS-0303-SO-N	**2.5**	**120**	<0.042	**12**	**13**	<0.092	<0.24	<0.012
SP12-SS-0303-SO-N	**3.0**	**120**	<0.042	**15**	**14**	<0.086	<0.24	<0.012
SP13-SS-0303-SO-N	**3.1**	**110**	<0.042	**13**	**12**	<0.087	<0.25	<0.012
SP14-SS-0303-SO-N	**2.4**	**100**	<0.042	**9.7**	**8.8**	<0.092	<0.25	<0.012
SP15-SS-0303-SO-N	**1.8**	**95**	<0.042	**8.1**	**7.1**	<0.099	<0.24	<0.012
SP16-SS-0303-SO-N	**2.5**	**100**	<0.042	**12**	**11**	<0.094	<0.25	<0.012
SP17-SS-0303-SO-N	**1.9**	**100**	<0.042	**12**	**10**	<0.093	<0.24	<0.012
SP18-SS-0303-SO-N	**2.8**	**120**	<0.042	**14**	**15**	<0.093	<0.25	<0.012
SP19-SS-0303-SO-N	**2.2**	**100**	<0.042	**13**	**14**	<0.098	<0.24	<0.012
SP20-SS-0303-SO-N	**3.8**	**160**	<0.042	**16**	**43**	<0.092	<0.24	<0.012
SP21-SS-0303-SO-N	**2.9**	**130**	<0.042	**16**	**16**	<0.086	<0.24	<0.012

Table 3-4
SUMMARY OF SOIL SAMPLE LABORATORY ANALYTICAL DATA - METALS
Former KK Aerial Applicator Site
Chandler Municipal Airport

Soil Sample ID	Metals - EPA Method 6010/7470 (mg/kg)							
	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
rSRL	**10**	**15,000**	**39**	**120,000**	**400**	**23**	**390**	**390**
nrSRL	**10**	**170,000**	**510**	**1,000,000**	**800**	**310**	**5,100**	**5,100**
GPL	**290**	**12,000**	**29**	**590**	**290**	**12**	**290**	**NE**
AOC-3 Landfill Test Pits								
TP10-SS-0'-0329-SO-N	**4.3**	**160**	**0.046**	**17**	**16**	<0.088	<0.49	<0.40
TP10-SS-10'-0329-SO-N	**2.6**	**68**	<0.099	**12**	**8.4**	<0.087	<0.49	<0.40
TP1-SS-0'-0329-SO-N	**2.3**	**110**	**0.058**	**59**	**210**	<0.085	<0.50	<0.40
TP1-SS-6'-0329-SO-N	**9.2**	**150**	<0.099	**13**	**12**	<0.091	<0.50	<0.40
TP2-SS-0'-0329-SO-N	**4.9**	**87**	<0.10	**9.9**	**13**	<0.097	<0.50	<0.40
TP2-SS-5'-0329-SO-N	**1.8**	**100**	<0.098	**11**	**13**	<0.085	<0.49	<0.39
TP3-SS-10'-0329-SO-N	**4.2**	**140**	**0.15**	**13**	**18**	<0.085	<0.49	<0.40
TP4-SS-0'-0328-SO-N	**3.0**	**100**	**0.082**	**13**	**22**	<0.090	<0.49	<0.39
TP4-SS-10'-0328-SO-N	**2.1**	**100**	<0.10	**11**	**8.2**	<0.089	<0.50	<0.40
TP4-SS-5'-0328-SO-N	**2.3**	**110**	**0.96**	**20**	**83**	<0.088	<0.50	<0.40
TP5-SS-10'-0328-SO-N	**5.1**	**130**	**0.18**	**15**	**13**	<0.088	<0.49	<0.39
TP6-SS-0'-0329-SO-N	**1.2**	**92**	**0.089**	**6.9**	**19**	<0.095	<0.50	<0.40
TP6-SS-10'-0329-SO-N	**8.0**	**140**	<0.099	**15**	**14**	<0.093	<0.49	<0.40
TP7-SS-0-0328-SO-N	**2.7**	**90**	**0.089**	**16**	**25**	<0.096	<0.50	<0.40
TP7-SS-10'-0328-SO-N	**6.9**	**93**	**1.2**	**17**	**23**	<0.092	<0.50	<0.40
TP8-SS-10'-0329-SO-N	**2.7**	**140**	**0.061**	**15**	**12**	<0.093	<0.49	<0.40
TP9-SS-10'-0328-SO-N	**2.3**	**91**	<0.099	**12**	**11**	<0.096	**0.27**	<0.40

Notes:
<0.00600 - Indicates analyte not present above laboratory reporting limit of 0.00600 mg/kg
BOLD Indicates analyte is present in concentrations greater than laboratory reporting limit
BOLD YELLOW - Indicates analyte is present in concentrations equal to or exceeding the lowest of either the ADEQ rSRL or GPL.
BOLD ORANGE - Indicates analyte is present in concentrations exceeding the ADEQ nrSRL

ADEQ - Arizona Department of Environmental Quality
bgs - Below ground surface
EPA - United States Environmental Protection Agency
ID - Identification
mg/kg - milligrams per kilogram
NE - Not Established
rRSLs- ADEQ Residential Soil Remediation Levels
nrRSLs- ADEQ Non-Residential Soil Remediation Levels
GPL - ADEQ minimum Groundwater Protection Level

4 REMOVAL ACTION SELECTION

The scope and objectives of a removal action at the Site are to protect human health and the environment by establishing appropriate cleanup levels for contaminants in the soil and landfill and removing and/or isolating contaminated soils exceeding these levels to the extent practicable. Isolation of contaminated materials exceeding cleanup levels may be achieved by removing and disposing of the soils at an appropriate facility, capping the soils on-Site, or treatment of the contaminated soils.

The potential viable removal action options were preliminarily screened using a matrix approach that evaluates effectiveness, implementability and cost. The higher ranked RAAs were further developed to identify the option that best matches the EE/CA remedial selection criteria. In general, RAAs can be grouped into the following categories: no action, engineering controls, institutional controls, treatment, containment, and removal.

Toxaphene is the primary contaminant present in the soil undergoing removal action at the Site. According to 40 Code of Federal Regulations (CFR) 261.33, toxaphene is characterized as a P123 hazardous waste when it is released to the land in-lieu of its intended use as a pesticide. The historic aerial applicator operations were involved in applying toxaphene to crops in the area using aircraft which is also referred to as "crop dusting". The toxaphene was apparently released to the Site soil as a result of spillage that occurred due to activities that included pesticide mixing, loading to aircraft tanks, and washdown of aircraft. Therefore, excavation of the impacted soil results in the soil being characterized as a P123 listed hazardous waste. If contaminated soil is designated for off-site disposal, it must be managed as hazardous waste and disposed of in a certified RCRA Sub-Title C landfill. However, designation of an area of contamination (AOC) for the purposes of remediation will allow on-site management of the soil. For the purposes of evaluating the RAAs, the entire Site is designated as the AOC.

The RAAs considered for the Site were as follows:

- **Alternative 1: No Action**. A "no action" alternative must be evaluated to provide a baseline for comparison to other alternatives.
- **Alternative 2: On-Site Capping.** Soils exceeding cleanup levels and the landfill may be capped to eliminate exposure to potential receptors. If this area is to be used for airport operations including construction of aircraft parking areas/hangars, this would be considered acceptable as a cap, which would be an engineering control. A Declaration of Environmental Use Restriction (DEUR) with engineering control will be required, which is an institutional control. This RAA will require designating the Site as the AOC.
- **Alternative 3: On-Site Treatment**. Chlorinated pesticides including toxaphene are the only compounds exceeding soil cleanup levels; therefore, treatment using chemical oxidants has proven effective in remediating the contaminants below RSRLs. This RAA will require designating the Site as AOC.
- **Alternative 4A**: **Removal and off-Site Disposal of Landfill Materials in a Permitted Landfill.** Landfill materials would be removed from the Site and transported via truck to a permitted construction/demolition debris landfill. This will require segregating toxaphene impacted soil from the landfill debris.
- **Alternative 4B**: **Removal and off-Site Disposal of Impacted Soils in a Permitted Landfill.** Soils exceeding cleanup levels would be removed from the Site and transported via truck to a permitted Sub-Title C hazardous waste landfill.

The above RAAs were evaluated by their ability to achieve the removal action objectives (RAOs) and meet Applicable, Relevant, and Appropriate Requirements (ARARs). Alternative 1 does not achieve RAOs and does not meet applicable ARARs. Therefore, Alternative 1 was not considered further.

Alternatives 2-4B were all evaluated to achieve the RAOs and meet the ARARs. Therefore, the selection of the preferred removal action from these four was based on short- and long-term effectiveness, implementability, and cost. All four alternatives met short- and long-term effectiveness and implementability. Therefore, selection of the preferred RAA was based on estimated cost and long-term considerations. The RAA evaluation was presented to the City, who made the final selection of the preferred RAA. The selection process is summarized as follows:

- Due to the requirement to dispose of removed soils in a RCRA certified Sub-Title C landfill, Alternative 4B was the costliest of the evaluated alternatives. Therefore, Alternative 4B was not selected.
- There were two options for Alternative 2. The first option was to leave the contaminated soil and landfill in-place and use the planned development of the Site as a soil cap or engineering control. This was identified as the lowest cost alternative. However, the landfill contents would possibly have to be removed for geotechnical engineering issues associated with the planned development. The second option was to place the contaminated soil in an on-Site consolidation cell at the landfill and install a cap as an engineering control. This option was estimated to be more expensive than option 1, but less costly than Alternative 3. Both options for alternative 2 require a DEUR and associated long-term maintenance and reporting requirements. The City decided that even though Alternative 2 represented the lowest cost, leaving the contamination in-place with a DEUR represented a long-term liability. Additionally, if the land use changed in the future, remediation may still be required. Therefore, the City decided not to select Alternative 2.
- Alternative 3 was evaluated to achieve the RAOs and to remediate the contaminated soil on-Site at more than one-third the cost of Alternative 4B. This eliminated the long-term requirement of leaving the contaminated soil in-place with a DEUR. Therefore, the City selected Alternative 3 as the preferred alternative.
- The contents of the landfill consist of demolition debris mixed with toxaphene contaminated soil. The demolition debris consists primarily of large broken pieces of concrete along with other debris. In order to treat the toxaphene contaminated soil below the landfill, the landfill contents must be removed. The toxaphene contaminated soil must also be segregated from the landfill contents for them to be treated by Alternative 3. Due to the potential geotechnical engineering issues discussed previously, the City decided to dispose of the demolition debris off-Site. Therefore, Alternative 4A was selected by the City as the preferred alternative for the demolition debris.

5 REMOVAL ACTION DESIGN/PROCEDURES

As shown on **Figure 3**, the Site has been divided into a grid consisting of 71 cells that for the purposes of this RAP are identified as DUs. Full DUs are approximately 100 ft x 100 ft. There are smaller triangular-shaped cells located along the northwest diagonal boundary of the Site. Due to the scope of work required for the landfill area, the removal action activities will start with excavation of the landfill area as described in **Section 5.2**. As the landfill contents are removed, soil treatment can commence in the northern portion of the Site as described in **Section 5.3**. After the landfill contents have been excavated and total depth is achieved, soil treatment will be implemented on the bottom of the landfill excavation as described in **Section 5.3**.

5.1 GENERAL REQUIREMENTS

5.1.1 HEALTH AND SAFETY

A Health and Safety Plan (HASP) will be prepared that addresses the health and safety hazards of each task conducted by WSP employees for this project, including the requirements and procedures for worker protection (per 29 CFR 1910.120). The HASP will be developed based on the hazards known or suspected to be present at the Site, specifically as they relate to the work to be conducted by WSP employees. The hazards and controls within this HASP do not necessarily address all the hazards associated with subcontractor personnel. Subcontractors may adopt this HASP; however, they will be responsible for reviewing and revising/amending the HASP to ensure that it addresses hazards unique to their operations.

Heavy construction equipment will be required to excavate and move soil and to apply the oxidizing reagent. The heavy equipment will be operated by the selected excavation subcontractor. WSP employees will be providing general oversight of removal action activities ensuring that procedures provided in this RAP are being followed and removal actions are limited to the identified areas of soil impact. WSP employees will also be responsible for collecting confirmation soil samples. Therefore, WSP employees should not be present near operating heavy construction equipment. WSP employees should have no physical contact with contaminated soil; therefore, they should wear Level D personal protection equipment (PPE). Dust control will be provided by wetting disturbed soil; however, if dust is visible, WSP personnel should wear N95 dust masks. When collecting confirmation soil samples, sampling personnel should wear PPE consisting of nitrile gloves and safety glasses/goggles.

Subcontractor personnel operating equipment should have little to no physical contact with contaminated soil. Therefore, they should wear Level D PPE. Dust control will be provided by wetting disturbed soil; however, if dust is visible, subcontractor personnel should wear N95 dust masks. In the event subcontractor personnel must contact contaminated soil, work gloves with nitrile glove liners should be used. Subcontractor personnel will be responsible for adding chemicals to the application tanks and mixing per EN Rx specifications. Personnel that mix the chemicals should wear chemical resistant clothing, goggles, and gloves.

The selected excavation subcontractor will provide sanitation facilities including an emergency shower and eyewash station.

5.1.2 UTILITY LOCATING

Prior to conducting field work, utility locating will be coordinated with the excavation subcontractor, the City, and Arizona 811 (a utility clearance communication center), to clear utilities within the earthwork area. Also, a private utility location service will confirm the presence of utilities within the planned excavation area (see **Appendix G – Standard Operation Procedure [SOP] #1**). Based on private utility locating that was conducted

prior to the EE/CA investigation, underground utilities are not present within the landfill excavation area and most of the treatment area. However, there are underground utilities associated with the communication towers located in the southern portion of the Site. Soil treatment will be performed around these communication towers. Based on private utility locating that was performed during the EE/CA investigation, underground utilities associated with the towers are buried at least four feet deep, which is below the planned treatment depth in this area.

5.1.3 WATER

Water is required for dust control, equipment washing/decontamination, application of chemicals, and wetting of the treated soil. A City fire hydrant located on the extension of Cooper Road at the Site access gate is tentatively designated as the water supply (**Figure 6**). The fire hydrant is located approximately 44 ft from the access gate. Development of Cooper Road is currently being planned. Therefore, the availability of the fire hydrant will be verified at the start of the project. The selected excavation/earthmoving subcontractor will be responsible for accessing the fire hydrant and providing the water supply line (hose or pipe) to the Site. The excavation/earthmoving contractor will obtain the fire hydrant meter the City Water Department and will be billed for water usage. The water supply will be required throughout treatment and until remediation is confirmed, which is expected to require up to 6 months.

5.1.4 DUST CONTROL

Due to the size of the treatment area, a dust control permit will be required by Maricopa County. The dust control permit will be obtained by the earthmoving subcontractor. Dust generation is also an issue of concern for airport operations and a health and safety issue for workers. Liquids will be applied to the soil during soil treatment (**Section 5.3**); therefore, this is expected to meet dust control requirements. Soil to be treated will be wetted to provide dust control. Water will also be applied to the treated soil to facilitate chemical oxidation. Soil will also be wetted during excavation of the landfill area to control dust generation. The landfill materials will also be wetted during screening to segregate debris from soil to control dust generation.

Dust monitoring is not expected to be required. Water will be applied if dust is observed during activities.

5.1.5 STORMWATER POLLUTION PROTECTION

Due to the size of the treatment area, a Stormwater Pollution Protection Plan and Permit (SWPPPP) will be required. The SWPPPP will be obtained by the excavation/earthmoving subcontractor. Soil, either contaminated or non-contaminated, cannot leave the Site. To place Best Management Practices (BMPs) at this Site, drainage features near the Site should be confirmed on the airport premises. Based on a desktop review of aerial imagery, it appears the only MS4 connectivity to the Site are Cooper Road at the southeastern corner of the Site and the drainage ditch located between the access road and taxiway along the diagonal northwest boundary of the Site. A short strip of gravel exists at the southeastern gate. There are two canals within the vicinity; one to the west of the Site is roughly 0.5 miles away and one to the east of the site is 1.5 miles away. Neither canal is listed as an Outstanding Arizona Water or impaired water. The southeast gate will be used as the ingress/egress point for construction traffic. General BMPs should ensure minimum track out.

1. Extend and refresh existing rock strip with larger rocks at the southeast gate.
2. A tire wash/equipment decontamination station will be located on DUs 70 and 71 as shown on **Figure 6**. The tire washing station will have secondary containment or drain into a lined pit/container to capture water. Water will be allowed to evaporate.
3. A rumble strip will be used at ingress/egress.
4. Barrier around the Site perimeter – straw wattles (staked 6' into the ground), silt fencing, or a berm.
5. Cover any inlets on the airport side, ideally with magnetic inlet covers or filter fabric with a regular cleaning schedule.

6 Manage watering truck to ensure large puddles do not accumulate which can cake onto equipment.

7 Suggested: Weekly inspection schedule and general SWPPP training for all contractors on-site.

5.1.6 EQUIPMENT DECONTAMINATION

Equipment decontamination is discussed in **Appendix G – SOP #2**.

5.1.7 INVESTIGATION DERIVED WASTE MANAGEMENT

The objective of the removal action is to minimize the quantity of investigation derived waste (IDW) that must be disposed off-Site. Where possible, IDW such as decontamination fluids and soil removed during decontamination will remain on-Site. Management of specific IDW is discussed in the following subsections.

5.1.7.1 LARGE EQUIPMENT DECONTAMINATION

Large equipment consists of excavators, loaders, dump trucks, and soil mixing equipment. Support vehicles such as pickup trucks should not enter the soil treatment area. To minimize/eliminate track out of soil, tire washing of large equipment will be required by the SWPPPP prior to the equipment leaving the Site. Residual soil will also be removed from the equipment using pressure washing. As shown on **Figure 6**, a large equipment decontamination pad will be located on DUs 70 and 71 prior to those DUs undergoing soil treatment. This will include a tire wash. A decontamination pad will be constructed to contain decontamination fluids and removed soil. Decontamination fluids will either be allowed to evaporate or transferred to soil treatment DUs that have not yet been treated. Accumulated residual soil will be placed on a soil treatment DU that has not yet been treated. The quantity of large equipment decontamination IDW is expected to decrease after soil treatment of the landfill area has been completed. The last DUs that will be treated are 70 and 71. The decontamination pad will be moved to an adjacent area while DUs 70 and 71 are treated. By the time DUs 71 and 72 are treated, enough soil treatment confirmation data would have been collected to demonstrate the effectiveness of the treatment in achieving the remedial goals. Any soils or liquids remaining after treatment of DUs 71 and 72 will be placed on those cells.

The decontamination pad will remain on-Site and in use until analytical data confirms the remedial goals have been achieved for all DUs. After the removal action is completed, the equipment pad materials will be washed onto the treated soil and disposed off-Site as solid waste.

5.1.7.2 SAMPLING EQUIPMENT DECONTAMINATION

Equipment that will be used to collect confirmation soil samples will consist of hand augers or disposable sampling equipment. This equipment will be decontaminated at the sampling location. Decontamination fluids will not be contained and will be allowed to collect on the treated soil.

5.1.7.3 FIELD SCREENING SUPPLIES

The samples that are field screened for toxaphene using the immunoassay kits will be extracted in the field using methanol. The extracts will be included with the confirmation samples that are submitted to the Eurofins Environment Testing America Phoenix, Arizona Laboratory (Eurofins). The extracts will be disposed by Eurofins.

5.1.7.4 PERSONAL PROTECTION EQUIPMENT

Field personnel are expected to have minimal contact with contaminated pre-treated soil. Most contact with soil will occur after treatment and during confirmation sampling. PPE that will require off-Site disposal should be limited to nitrile gloves. These will be disposed off-Site as solid waste.

5.2 LANDFILL AREA

Remediation of the landfill area will require removing soil that is contaminated and stockpiling the soil on portions of the Site that are contaminated and have not yet been treated. The planned area to stockpile contaminated soil is shown on **Figure 6**. Excavation of the landfill will commence on the first day of the removal

action. The landfill covers an area of 40,656.60 sqft or 0.93 acres; however, as shown on **Figure 6** it is irregular in shape. To allow access for soil treatment equipment and to provide excavation safety, the sides of the excavation will be sloped 1.5 ft horizontal to 1 ft vertical (1.5:1). Therefore, an approximate 280 ft x 280 ft area will be excavated around the landfill (**Figure 6**). The excavation is assumed to be 10 ft deep. Therefore, an estimated 29,200 cuyds of material will be removed from the excavation. Of this volume, the landfill materials constitute approximately 15,000 cuyds (50% of which is soil). Asbestos containing materials (ACM) or other hazardous materials were not encountered during the EECA. Should additional ACM be encountered, a qualified Asbestos Hazard Emergency Response Act (AHERA) investigator will be present on-Site during the landfill excavation. The top two (2) ft of soil is contaminated with toxaphene. The following steps will be performed:

1. Removal of the soil piles located north of the landfill area (**Figures 2-4**). The soil piles consist of an estimated 4,200 cuyds of soil. These soil piles do not contain contaminants (**Section 3.3**). The City has decided to use the soil piles to backfill the landfill excavation. Based on analytical results presented in **Section 3.3**, the soil piles do not contain hazardous compounds above RSRLs. Therefore, the soil piles are suitable for on-Site use as backfill material and will be removed and temporarily stockpiled in the southwest corner of the Site (**Figure 6**).
2. The top two ft of soil from the 280 ft x 280 ft area (5,800 cuyds) will be removed and stockpiled in the area of cells 30, 35, and 36 shown on **Figure 6**. These soils will then be moved to portions of cells 17, 18, 23, 27, 31, 36, 37, 38, 39, 40, 41, 43, 44, 45, 46, and 47 shown on **Figure 6** and treated as described in **Section 5.3.2**.
3. Excavated soil to the edge of the landfill contents as indicated by the presence of concrete chunks is considered to not be contaminated. The estimated volume is 8,400 cuyds. This soil will be stockpiled in the southwest corner of the Site as shown on **Figure 6** to be used as backfill for the excavation.
4. The landfill contents will be removed and taken to the area of contaminated soil located to the west of the landfill excavation (**Figure 6**). The contents will be screened to segregate contaminated soil from the demolition debris. The demolition debris will be washed with water during segregation to remove residual soil.
    a. The estimated 7,500 cuyds of demolition debris (assumed to be mainly concrete) will be transported to a certified construction debris landfill for disposal. As a contingency, 10-20 additional materials potentially containing asbestos may be encountered and 30-60 samples will be collected for asbestos analysis. If friable asbestos is found, it will be disposed in a designated landfill. The materials will also be tested for the presence of pesticides and other contaminants per landfill acceptance criteria. If toxaphene is detected above 5.0 mg/kg, the material will be washed again until toxaphene is below 5.0 mg/kg.
    b. The estimated 7,500 cuyds of soil will be spread on portions of cells 17, 18, 23, 27, 31, 36, 37, 38, 39, 40, 41, 43, 44, 45, 46, and 47 shown on **Figure 6**. This soil will be treated as described in **Section 5.3.2**.
5. The bottom approximate 250 ft x 250 ft area of the excavation will be treated to a depth of two feet (4,600 cuyds) as described in **Section 5.3.2**.
6. After a waiting period of approximately 30 days, confirmation samples will be collected as discussed in **Section 6.0**.

The landfill excavation area will remain open following soil remediation and will be backfilled to specified grading and compaction specifications during future Site construction.

5.3 SOIL TREATMENT

5.3.1 TREATABILITY STUDY

EN Rx performed a treatability study to design the dosing required to achieve the soil cleanup goal of less than 5.0 mg/kg for toxaphene. EN Rx required a minimum of seven (7) kilograms or approximately 15 pounds (lbs) of soil

from two areas of the Site for the treatability study. WSP selected the locations of surface soil samples SB-18 and SB-26 that were reported with 1,100 and 30 mg/kg of toxaphene, respectively. Sample SB-18 was reported with the highest concentration of toxaphene in the EE/CA investigation samples. This sample was also detected with 57 mg/kg of 4,4-DDE, which exceeds the 10^{-5} RSRL of 20 mg/kg and is the highest 4,4-DDE concentration reported in the EE/CA investigation samples. The treatability samples were collected on September 14, 2022 and were shipped to EN Rx. The results of the treatability study are provided as **Appendix G**.

5.3.2 DESIGN

Remedial actions have the potential for releasing contaminants from the soil or producing hazardous daughter products. This is often a concern with use of chemical oxidants. Two commonly used chemical oxidants for chlorinated compounds are permanganate and persulfate. These products are strong oxidants that degrade chlorinated compounds to inert products that include water, carbon dioxide, and free chlorine. Permanganate is a mined product and can potentially contain other heavy metals in addition to manganese. Manganese and other heavy metals may be released to the soil above RSRLs. Hexavalent chromium (CrVI) is of concern because it is a known human carcinogen. Activated persulfate will leave residual sulfate in the soil. Here is not a RSRL for sulfate; however, sulfate can possibly impact groundwater above the secondary drinking water standard making it a potential groundwater contaminant. Based on these concerns, the EN Rx reagent was selected to perform the removal action.

The exact constituents of SSO and Synergist-D are proprietary. The only two metals/elements that are present are sodium (Na) and chloride (Cl). Product safety data sheets (SDSs) for the SSO and Synergist-D are included as Appendix H. For the cells expected to have the highest COC concentrations, sodium hydroxide (NaOH) may be added as a pH buffer. Therefore, a SDS for NaOH is also included in Appendix H. There are no other harmful byproducts. Oxidation is viewed to be completed and the residuals are just the Na and Cl, and the hydrogen peroxide is lost as oxygen and water. The pH of the Synergist-D is 3 to 4 (depends how it is mixed), and the SSO has a pH of 10. Because of the concentrations of the amendments needed at the site, we expect the soil to initially have high pH, Na, and Cl until well mixed into each table. For instance, 0-8 inches gets a stronger treatment but is blended into 8-24 inches to dilute Na and Cl.

As shown in **Table 3-4**, heavy metals are not present above RSRLs in the soil to be treated. Strong oxidants can convert trivalent chromium (CrIII) in the soil to CrVI. The RSRL for CrVI is 30 mg/kg. As shown in **Table 3-4**, only one soil sample (TP1-SS-0'-0329-SO-N) was detected with a total chromium (59 mg/kg) exceeding the CrVI RSRL of 30 mg/kg. For this one sample, the production of CrVI above the RSRL of 30 mg/kg will require that more than 51% of the total chromium is converted to CrVI, which is unlikely. All other collected soil samples were reported with less than 30 mg/kg of total chromium. Therefore, production of CrVI above the RSRL resulting from the application of the EN Rx reagent is not of concern.

Assuming a depth of two feet, the volume of toxaphene contaminated soil outside the landfill excavation area is approximately 18,200 cubic yards. The volume of soil per treatment cell is provided in **Table 5-1**. Including the impacted soil removed from the landfill area, an estimated 34,734 cubic yards of soil is contaminated with toxaphene above 5.0 mg/kg. This is the volume of soil that is considered in the treatment design. Based on the results of the treatability study, the total treatment dosage for the entire site is 230,000 lbs. of Solid Singlet Oxygen (SSO) oxidizer and 16,125 lbs. of Synergist-D activator. The proposed treatment dosage for the contaminated soil outside the landfill excavation area is 132,680 lbs. of SSO and 9,700 lbs. of Synergist -D and the proposed treatment dosage for the contaminated soil within the landfill excavation area (0-12 feet total depth) is 97,320 lbs. of SSO and 6,325 lbs. of Synergist -D. The EN Rx reagent application treatment plan design will be completed in several stages:

- Pre-watering the Site as necessary for dust control and pre-treatment Site moisture conditioning to bring the soil into optimum moisture content for the chemical reaction during the soil remediation treatment application process.
- On-site construction of the EN Rx chemical reagent mixing, storage, and transfer pumping systems.

- The anticipated treatment processing path / area sequences will be designed to facilitate maximum length of treatment passes, coverage of irregular boundary edges, and accelerate sprinkler installation post-treatment to reduce dependence on water trucks.
- GPS systems (Trimble dual mast L1/L2 RTK or similar) will be utilized on the RM 500 and excavators to maintain accuracy of the treatment areas depth and coverage. The dual mast system calculates attitude and vector. Every machine that is equipped with GPS for site preparation work will be measured to the nearest hundredth of a foot.
- The upper two feet of impacted soil (5,800 cu yds) within the landfill excavation outline (280-feet x 280-feet) will be removed for the continued excavation and segregation of the remaining landfill material **(Figure 6)**. Once the upper two feet of impacted soil in the landfill area is removed, the soil will be transported to portions of the proposed staging cells and spread to a depth of approximately two feet on portions of cells 38, 39, 40, 41, 43,44, 45, 46, and 47 **(Figure 6)** for treatment.
- Continued treatment of the Site and the excavation of the remaining materials from the landfill will occur at the same time. The excavated landfill material will be staged and segregated on portions of cells 30 -31 and 35-36 and the segregated contaminated soil (7,500 cu yds) will then be placed on portions of cells 17, 18, 23, 27, 31, 36, 37, 38, 39, 40, 41, 43, 44, 45, 46, and 47 for treatment **(Figure 6)**. The soil will be placed in approximate 1-foot lifts for treatment.
- Once the landfill has been excavated to ten feet and all the materials removed, the bottom two-feet of the excavation (approximately 250-feet x 250-feet) will be treated with EN Rx reagents (SSO and Synergist-D) to address any contaminated soil. This soil will be blended thoroughly, and the moisture content will be maintained to allow for a complete chemical reaction.
- The targeted areas (cells) with the highest concentrations of toxaphene will be treated after the initial upper two feet of the landfill area is completed.
- The remaining areas requiring treatment outside of the landfill to two feet will then be addressed based on the remedial design plan.
- Any areas requiring re-treatment after confirmation sampling is completed will be addressed.
- Post treatment moisture content of the remediation soil will be completed to maintain optimum moisture content (above 15%) for the required chemical reactions either by water trucks or a water sprinkler array.

EN Rx has recommended an application utilized at a recent toxaphene soil remediation project performed by EN Rx in California that incorporated a Caterpillar RM 500 roadbed soil stabilization machine (RM 500) coupled with lined water trucks that were used to transfer the reagent batches to the RM 500 during application. The approach will use the RM 500 to pulverize and homogenize the remediation area to prepare the soil for the addition of the remediation compounds and the area will also be moisture conditioned to reduce dust and bring the soil into optimum moisture content for the chemical reaction.

The treatment plan incorporating a constant depth "mixing table" in the remediation area based on **Figures 3 and 6** will be completed prior to the addition of chemical reagents. The design will involve dry mixing of the 2-ft thick treatment area soil (two treatment zones 0 to 8-inches and 16 to 24-inches) with the RM 500 or equivalent followed by precise GPS controlled wet passes utilized for mixing while injecting the chemical activator to allow for maximum contact between the reagent and the impacted soil. The RM 500 application provides a very uniform, controllable application throughout the treatment zone and decreases required handling/mixing of the impacted material. The only limitation is that the maximum treatment depth of the RM 500 is 18-inches and will involve the temporary removal and stockpiling of the first approximately 8-inches of un-treated material within a cell/DU to treat the second pass with the RM 500 to reach the target depth of 24-inches (discussed in greater detail below).

Designing the anticipated treatment processing path/area sequences to facilitate maximum length of treatment passes, coverage of irregular boundary edges, and accelerated sprinkler installation post-treatment to reduce dependence on water trucks will be utilized. Monitoring the treatment area to confirm soil densities and soil moisture will be conducted by WSP personnel. Process and moisture monitoring before, during, and after reagent

application, and daily maintenance of the moisture content of the remediation soil to maintain optimum moisture content (above 15%) for the required chemical reactions to be completed.

The proposed EN Rx treatment plan is designed around the utilization of the RM 500 roadbed stabilizer, which is equipped with an eight-foot-wide and two feet in diameter drum containing 209 carbide teeth with a maximum depth of 18-inches. The drum is operated in a reverse direction to the forward path, and a 16-nozzle spray bar positioned on top of the drum sprays reagent fed from the transfer truck with a high pressure pump up to 100 gallon/minute.

Based on the required Site treatment zone total depth of 2-feet for each cell / DU and the maximum depth limitations of the RM 500 being 18-inches, two proposed treatment zones will be completed, an initial 8-inch treatment cut followed by a 16-inch treatment pass. The initial treatment zone of 8 inches is intentional for two remediation design reasons. This is the depth required to be temporarily removed for the RM-500 to complete its second treatment pass and achieve the total treatment depth of 24 inches. The analytical data identified that in general, greater contaminant concentrations are apparent in the upper 8 inches of the treatment zone and are more consistent with fate and transport of Toxaphene. In all cases, an 8-inch treatment pass will be completed before treatment of the lower soil interval. To reduce application time, the RM 500 will be backed up after each pass with the supply truck attached, and then moved over 7.5 feet for the next pass. This 6-inch overlap will ensure precise coverage of all soils and will be continuously monitored by an on-board GPS unit to the nearest centimeter.

The initial dry treatment of SSO with specific dosage requirements calculated per treatment cell / DU will be applied to the area prior to the first dry pass by the RM 500. This will allow for better blending and distribution of the SSO within the soil matrix during mixing and the soil will be pulverized and homogenized which typically increases the mixing / treatment zone thickness during the aeration operation.

Following the initial dry blending and mixing pass, a second "water only" RM 500 pass may be necessary (based on the soil moisture levels during treatment) over the treatment zone which will continue to blend and hydrate the SSO oxidant into the soil matrix that also increases the overall moisture content for treatment. If the Synergist-D activator can be added with enough water for a single pass application, that is preferable.

In general, the proposed design for the Synergist-D activator chemical handling, mixing and transfer system is composed of two 500-gallon poly tanks (water trailers) each connected to a local water supply. The water trailers are connected to 5 hp gas powered centrifugal pumps / 2-in – transfer pumps. These provide 50-100 gallons per minute recirculation mixing and discharge of the reagent to a two-inch common header and J-stand fill point over the 3,000- gallon lined water trucks. This will be used for mixing the concentrated Synergist-D activator. The concentrated Synergist – D mixture will be transferred into the 3,000-gallon tanker trucks which will be approximately 50% full of water. Once the Synergist – D mixture is transferred the remainder of the required fresh water is added to the tanker truck to dilute and mix thoroughly prior to the activator application treatment pass.

Each of the 3,000-gallon Synergist-D batches are designed to treat multiple 100 ft passes (this may be adjusted in the field based on the treatment site layout, contaminant concentration or adjust the speed the operation). In general, for the 8-inch treatment passes, 3,000 gallons of reagent will treat approximately 375 ft of soil. Similarly, the deeper 16-inch treatment pass to 24" total depth, 3,000 gallons will treat approximately a 125 ft pass. The application flow rate will be computer controlled proportional to the forward speed so that a selected gal/sq yard rate is always precisely and automatically maintained. Once the "wet passes" are complete per treatment cell / DU it is estimated to bring the treated soil moisture content to approximately 17% in these areas.

The specific treatment design approach per in-situ treatment cell/DU will include:

- The upper 8-inch portion of 50% of the treatment cell/DU will be scraped and temporarily stockpiled on the un-treated half of the specific cell/DU.
- A specific RM 500 reagent treatment application will be completed for the deeper treatment depth (8-24 inches) on the initial half of the treatment cell/DU.
- Once the remaining deeper soil interval has been completely treated, the initial shallow zone un-treated soil will then be placed back on top of the treated deeper zone.

- The upper 8-inch portion of second half of the un-treated treatment cell/DU will then be scraped and temporarily stockpiled on the untreated upper portion of the first half of the specific cell/DU while the 2nd half deeper treatment depth (8-24-inches) is completed.
- Once the 2nd half of the remaining deeper soil interval has been completely treated the initial shallow zone treated soil will then be placed back on top of the 2nd half treatment cell /DU treated deeper zone.
- The upper 8-inches of the entire treatment cell /DU will then be treated.

A similar approach will be performed for the soil removed from the landfill area. However, as shown on **Table 5-1**, the estimated soil thickness at each cell is 4.37 ft. Therefore, after one ft of soil is placed on a cell, that cell will be treated. Treatment will be performed on each additional one ft interval that is placed until a depth of approximately 4.37 ft is reached. The final interval may be slightly larger than one ft.

This EN Rx reagent soil treatment application will be completed at each of the proposed cells/DU's across the Site. After each of the treatment cells/DU areas are completed, the soil must be kept moist to obtain optimum treatment activation. This will initially be performed using the watering trucks. Subsequent watering either by spraying from a truck or via the irrigation sprinklers will be necessary to compensate for evaporation and maintaining soil moisture content for optimum treatment activation.

After completion of each of the larger grid treatment areas, a hydrant fed irrigation water line system will be installed with main lines and sprinkler laterals on 60-ft centers. Soil moisture monitoring will be performed at least three times per week to provide data to direct daily moisture maintenance using the sprinkler system. Moisture control watering will continue through completion of all confirmation compliance sampling to ensure reaction of any residual EN Rx reagents. After a minimum waiting period of 30 days, confirmation samples will be collected as discussed in **Section 6.0**.

TABLE 5-1 SOIL TREATMENT INFORMATION						
Cells	**Number**	**Grid Size**	**Area Each (sq ft)**	**Depth Each (ft)**	**Soil Volume cuyds (each)**	**Total Soil Volume (cuyds)**
In-Situ Soil						
13, 19, 20, 21, 35, 57, and 62	7	Full, 100'x100'	10,000	2	741.75	5192.25
8 & 9	1	Enlarged Full	11,049.45	2	818.48	818.48
14 & 15	1	Enlarged Full	11,606.79	2	859.76	859.76
17 & 30	1	Partial	9,795.27	2	725.58	725.58
34 & 40	1	Partial	9,853.57	2	729.89	729.89
2	1	Partial	5,589.72	2	414.05	414.05
4	1	Partial	3,506.99	2	259.78	259.78
5	1	Partial	3,907.36	2	289.43	289.43
7	1	Partial	2,547.92	2	188.73	188.73
11	1	Partial	898.74	2	66.57	66.57
12	1	Partial	6,600.71	2	488.94	488.94
18	1	Partial	6,694.51	2	495.89	495.89
22	1	Partial	3,832.77	2	283.91	283.91
23	1	Partial (outside landfill excavation)	2,960.51	2	219.30	219.30
24	1	Partial (outside landfill excavation)	6,341.18	2	469.72	469.72
25	1	Partial (outside landfill excavation)	6,341.16	2	469.72	469.72
26	1	Partial (outside landfill excavation)	6,089.58	2	451.08	451.08
27	1	Partial (outside landfill excavation)	2,578.84	2	191.03	191.03
29	1	Partial	2,330.79	2	172.65	172.65
31	1	Partial	3,043.35	2	225.43	225.43
32	1	Partial	1,910.78	2	141.54	141.54
33	1	Partial	4,265.62	2	315.97	315.97
36	1	Partial	9,697.50	2	718.33	718.33
38 & 39	1	Partial	5,784.84	2	428.51	428.51
40 & 41	1	Partial	7,368.49	2	545.81	545.81
47	1	Partial	2,248.73	2	166.57	166.57
53	1	Partial	6,191.56	2	458.63	458.63
56 & 61	1	Partial (outside landfill excavation)	4,618.12	2	342.08	342.08
63	1	Partial (outside landfill excavation)	7,444.68	2	551.46	551.46
64	1	Partial	3,445.67	2	255.23	255.23
65	1	Partial	3,069.23	2	227.35	227.35
66 & 71	1	Partial	3,853.34	2	285.43	285.43
67	1	Partial	6,790.15	2	502.97	502.97
68	1	Partial	2,224.01	2	164.74	164.74
70	1	Partial	4,201.02	2	311.19	311.19
Total						**18,428.02**

TABLE 5-1 SOIL TREATMENT INFORMATION						
Cells	**Number**	**Grid Size**	**Area Each (sq ft)**	**Depth Each (ft)**	**Soil Volume cuyds (each)**	**Total Soil Volume (cuyds)**
In-situ Soil Bottom of Landfill						
24 & 25	1	Partial	1,137.59	2	84.27	84.27
27 & 58	1	Partial	2,134.20	2	158.09	158.09
54	1	Partial	9,830.60	2	728.19	728.19
55	1	Partial	8,827.91	2	653.92	653.92
59	1	Partial	9,851.48	2	729.74	729.74
60	1	Partial	7,575.47	2	561.15	561.15
64 & 65	1	Partial	1,299.37	2	96.25	96.25
Total						**3,011.60**
Soil Removed from Landfill						
17	1	Partial	1,524.28	4.37	246.71	246.71
18	1	Partial	2,224.05	4.37	359.97	359.97
23	1	Partial	4,877.70	4.37	789.46	789.46
27	1	Partial	1,777.21	4.37	287.65	287.65
31 & 36	1	Partial	7,262.12	4.37	1,175.39	1,175.39
38	1	Partial	4,945.55	4.37	800.45	800.45
39	1	Partial	4,653.02	4.37	753.10	753.10
40	1	Partial	8,971.57	4.37	1,452.06	1,452.06
41	1	Partial	3,121.41	4.37	505.21	505.21
43	1	Partial	5,000.00	4.37	809.26	809.26
44, 45 & 46	3	Full, 100'x100'	10,000	4.37	1,619	4,855.56
47	1	Partial	7,781.78	4.37	1,259.50	1,259.50
Total			**82,138.67**			**13,294.30**

6 REMEDIATION CONFIRMATION SAMPLING AND ANALYSIS PLAN

The remediation confirmation SAP was developed in accordance with guidance provided by the VRP DQP (ADEQ, 2021).

6.1 DATA QUALITY OBJECTIVES

The Data Quality Objectives (DQOs) for the remediation confirmation sampling were developed based on the EPA *Guidance on Systematic Planning Using the Data Quality Objectives Process* (EPA 2006a). In the guidance, the following seven steps were identified to develop site-specific DQOs:

1. State the Problem
2. Identify the Goal of the Confirmation Sampling
3. Identify Decision Inputs
4. Define Boundaries
5. Develop the Analytical Approach
6. Specify Performance and Acceptance Criteria
7. Develop the Plan for Obtaining Data

Each of the above steps to develop the site-specific DQOs are discussed in the following sub-sections.

6.1.1 PROBLEM STATEMENT

The City is planning to develop the Site as part of Chandler Municipal Airport. As previously discussed, the City has decided to remediate the toxaphene contamination in the soil to below the RSRL of 5.0 mg/kg. Therefore, the goal of the removal action is to: 1) obtain Site closure with no further action eliminating the requirement for a DEUR with engineering control, 2) allow development of the Site, and 3) eliminate exposure of future Site workers to COPCs.

Soil sampling and analyses will be performed to confirm remediation of the contaminants of concern (COCs), particularly toxaphene, within the identified contaminated area. Depth-specific composite soil samples will be collected from each DU within the area of toxaphene soil contamination and will initially be field-screened for toxaphene using immunoassay kits provided by Beacon Analytical Systems, Inc. (Beacon). All soil samples to confirm remediation will be submitted to Eurofins, an Arizona licensed analytical laboratory, for confirmation analysis using EPA Method 8081A.

6.1.2 CONFIRMATION SAMPLING GOAL

The principal decision of the removal action is Site closure to unrestricted use with no further action. Therefore, confirmation soil samples must be reported with toxaphene, DDE, and DDT below their respective 10^{-5} RSRLs.

6.1.3 DECISION INPUTS

The key decision inputs are concentrations of COPCs after ISCO treatment and comparison to RSRLs.

6.1.3.1 CONTAMINANTS OF POTENTIAL CONCERN

The following organochlorine pesticides were detected above 10^{-5} RSRLs by the EE/CA investigation and are identified as COCs:

- Toxaphene (5.0 mg/kg)
- DDT (20 mg/kg)
- DDE (20 mg/kg)

6.1.3.2 REMOVAL ACTION CONFIRMATION APPROACH

The focus of the removal action confirmation sampling for the Site is to gather data necessary to confirm that COPCs have been remediated below 10^{-5} RSRLs. The removal action confirmation goals will be achieved using a sampling strategy that subdivides the Site into DUs.

6.1.4 REMOVAL ACTION BOUNDARY

The removal action boundary is shown on **Figures 3 through 7** and encompasses the area identified with toxaphene concentrations above 5.0 mg/kg, which is approximately 322,743.73 sqft or 7.41 acres and includes the landfill area. **Figures 3 through 7** show the DUs that are completely or partially within the area of soil contaminated with toxaphene. Maximum sample depth will be 24-inches.

6.1.5 ANALYTICAL APPROACH

Confirmation of remediation within the removal action boundary Site will be based on the collection and analysis of composite soil samples from each impacted DU. The locations of confirmation samples are shown on **Figure 7**. The confirmation decision rules are presented in the following subsections.

6.1.5.1 LANDFILL

During the EECA investigation, potential asbestos containing materials were encountered in the landfill. These materials were tested for asbestos and found to not contain friable asbestos. Should additional materials be encountered during landfill excavation, samples will be collected. Samples will be labeled, and appropriate chain-of-custody documentation will be completed. Samples will be delivered to Fiberquant Analytical Services in Phoenix, Arizona, for visual inspection and microscopic analysis. Samples will be analyzed using polarized light microscopy (PLM) coupled with dispersion staining as outlined in USEPA Method 600/R-93/116.

The percentage quantification of individual sample constituents will be determined by visual estimation. Under regulations promulgated by USEPA, ACMs are defined as those materials that contain more than one percent (1%) of specified asbestiform minerals. Bulk samples determined to contain more than 1% of specified asbestiform minerals are referred to as "positive." All the bulk samples collected during the inspection were analyzed. Material samples that were less than 5% asbestos-containing by PLM were analyzed using the point count method.

The designated landfill may require that the demolition materials removed from the landfill be tested for additional compounds, including pesticides. Therefore, the materials will be analyzed to meet landfill acceptance criteria.

6.1.5.2 SOIL TREATMENT AREA

This area includes the treated surface soil and soil below the landfill materials. Except for the treated soil removed from the landfill, up to five discreet soil samples will be collected from 0-1 ft and from 1-2 ft from each treated DU, including the soil below the landfill materials. For the soils removed from the landfill area, up to five discreet soil samples will be collected from 0-2 ft and from 2-4 ft from each treated DU. A smaller number of samples will be collected from smaller size DUs as shown on **Figure 7**. For each DU that has been treated, the soil samples collected from shallow interval will be composited into one sample and the soil samples collected from

the deeper interval will be composited into one sample. All soil samples will be screened in the field using immunoassay kits. A total of 116 samples, including eight samples below the landfill materials, are estimated to be collected and field screened. The immunoassay kits provided by Beacon Analytical Services for toxaphene will be used to screen samples as less than (<) 2.0 ppm and greater than (>) 10 ppm as described in **Appendix D – SOP #3**. The confirmation decision rules are presented as follows:

- If the field screen result for a sample is >10 ppm and confirmed a week later by a second result, that DU will be re-treated and re-screened.
- If the field screen result for a sample is between 2.0 and 10 ppm, a confirmation sample will be collected a week later. If the result remains between 2.0 and 10 ppm, that sample will be submitted to Eurofins and analyzed for organochlorine pesticides by EPA Method 8081A on a 10-day turnaround. Analysis of toxaphene, DDE, and DDT will be requested; therefore, verbal results are expected to be available within five days. If toxaphene, DDE, or DDT exceed their respective 10^{-5} RSRLs, then that DU will be re-treated and re-screened.
- If the toxaphene field screen result for a sample is <2.0 ppm, that cell will be considered remediated. The sample will be submitted to Eurofins for confirmation analysis by EPA Method 8081A.

Closure to unrestricted use with NFA is the remedial goal. Therefore, all soil samples used to confirm remediation will be analyzed for toxaphene, DDE, and DDT by Eurofins using EPA Method 8081A. All samples will be analyzed on a 10-day turnaround.

6.1.6 PERFORMANCE AND ACCEPTANCE CRITERIA

A potential source of decision error relates to the selection of sampling locations that minimize the possibility of underestimating COPC concentrations. Considering soil is being treated within each impacted DU, composite sampling is being utilized to minimize these errors. Collected soil samples will be field screened for toxaphene. The immunoassay kits screen toxaphene concentrations at 2.0 and 10 ppm or mg/kg. Decision errors will be eliminated by analyzing soil samples for organochlorine pesticides by EPA Method 8081A per the decision rules presented in **Section 6.1.5**. Decision error analysis will also be managed through the incorporation of quality control (QC) procedures in the collection, analysis, and interpretation of data. These include the evaluation of data quality indicators (DQIs), the verification of laboratory data, and procedural controls on sample handling, labeling, custody, and documentation.

6.1.6.1 DATA QUALITY INDICATORS

DQIs (accuracy, precision, completeness, representativeness, and comparability) refer to QC criteria established for various aspects of data gathering, sampling or analyses. In defining DQIs for this project, the level of uncertainty associated with each measurement must be defined. The values that are to be assigned to the quantitative DQIs (accuracy, precision, and completeness) and statements concerning the qualitative indicators (representativeness and comparability) are determined by the ultimate decision presented in **Section 6.1.2**.

Eurofins is licensed by the Arizona Department of Health Services to analyze samples for compliance purposes. **Table 6-1** provides the Eurofins DQIs.

Table 6-1 Data Quality Indicator Table

DATA QUALITY INDICATORS (DQIS)	MATRIX	PARAMETER	MEASUREMENT PERFORMANCE CRITERIA	QC SAMPLE AND/OR ACTIVITY USED TO ASSESS MEASUREMENT PERFORMANCE	QC FOR FIELD (F), LABORATORY (L), OR BOTH (F&L)
Precision	Soil	Pesticides,	RPD ≤ 40% for both field samples when ≥ the RL[1]	Field duplicates	F & L

DATA QUALITY INDICATORS (DQIS)	MATRIX	PARAMETER	MEASUREMENT PERFORMANCE CRITERIA	QC SAMPLE AND/OR ACTIVITY USED TO ASSESS MEASUREMENT PERFORMANCE	QC FOR FIELD (F), LABORATORY (L), OR BOTH (F&L)
Precision	Soil	Pesticides	RPD ≤ 40% for both field samples when ≥ the RL	LCS/LCSD[2] MS/MSD[3]	L
Accuracy	Soil	Pesticides	Spike recovery ± 50%	LCS/LCSD MS/MSD	L
Accuracy	Soil	Pesticides	Contamination – no target compounds ≥ the RL	Field blanks, equipment blanks, trip blanks, instrument blanks	F & L
Representativeness	Soil	Pesticides	Appropriate sample design and SOPs developed through DQO process;	Data verification, reconciliation with DQOs and data usability evaluation will be conducted (Section 6.1.6.2)	F
Completeness	Soil	Pesticides	95%	Number of valid samples relative to field sample plan	F
Comparability	Soil	Pesticides	Appropriate sample design developed through DQO process; one laboratory and one analytical method used for each type of analysis; SOPs for sample collection and analysis will be followed – data verification	Data verification will be conducted (**Section 6.1.6.2**) during the investigation and after data are received from the laboratory. Field audits will be conducted to ensure the SOPs are being followed.	F & L
Sensitivity	Soil	Pesticides	± 20% at RL	Laboratory standard blank at RL	L

1. RL – Reporting Limit
2. LCS/LCSD - Laboratory Control Sample/Laboratory Control Sample Duplicate
3. MS/MSD – Matrix Spike/Matrix Spike Duplicate

6.1.6.2 *DATA VALIDATION AND USABILITY*

Eurofins will internally perform data review and reporting as specified in their Laboratory QA Manuals.

Due to the limited scope, limited duration, and investigative nature of this project, data validation is not proposed, and a Tier 1 cursory review of the QC data will be performed for the project. Data verification will be performed by the Project Manager. The data verification consists of an Evaluation Tier 1A review of the laboratory reports to identify analytical issues or deficiencies that might affect quality and the user decisions based on the data. The data verification will consist of the elements presented below and will be performed on 100% of the data.

Table 6-2 Data Verification Table

Completed	Review Item
	Case Narrative Have any anomalies, deficiencies, and QC problems been identified in the case narrative? What corrective action, if any, was taken?
	Chain of custody Documentation Are the original chain of custody forms with identification numbers and laboratory receipt signatures present?
	Sample Analysis results Are sample analysis results included for environmental samples, with quantitation limits (include dilutions and re-analyses)?
	QC Summary Is the following Information included?
	Method blanks, continuing calibration blanks, and preparation blanks.
	Surrogate percent recoveries.
	Internal standard percent recoveries.
	Matrix Spike percent recoveries.
	Laboratory duplicate relative percent recoveries.
	Laboratory QC check sample, laboratory control sample recoveries.
	Field duplicates, if identified, reproducibility will be evaluated.
	Acceptance criteria, if not already established by the method DQI.
	Definitions for any laboratory data qualifiers used.
	Specifically review the following:
	Was a check for timeliness and errors conducted, including requested deliverables, preservation, holding times, and chain of custody?
	Was a duplicate sample MS/MSD and MS/MSD/post digest spike reviewed against precision and accuracy criteria specified by the method or by project DQIs?
	Were compound quantitation and reported detection limits reviewed, checking reporting limits against contract required limits?
	Does the Laboratory Report include the following information?
	Case narrative including, but not limited to, an overall summary of data acceptability and comparison to DQIs and data quality initiatives, a list of recommended changes, a summary of all laboratory contracts, in which communications with the laboratory, if any, would be identified, and any other problems associated with the actual analysis which might impact the sample integrity or data quality?
	Tabulated summary of all data results supplied electronically by email or on a compact disc in a commonly used software format.

Other Quality Assurance/Quality Control (QA/QC) assessments (such as review of raw laboratory data, surveillance, peer review, management systems review, readiness review, technical systems audit, performance

evaluation, etc.) will not be performed for this project because sampling activities are of limited scope and duration.

6.1.7 DATA COLLECTION PLAN

The development of an optimal plan for this project has included the identification of key decisions to be made, a comprehensive review of previous investigation results, and an evaluation of decision uncertainty. The design for the removal action and confirmation sampling has been optimized by using existing Site data to develop an accurate conceptual site exposure model (CSEM). This approach results in a data collection scheme that efficiently collects the data needed to confidently confirm remediation while managing and mitigating uncertainties associated with the supporting data. The Field Sampling Plan (FSP) is provided in **Section 6.2**.

6.2 FIELD SAMPLING PLAN

The planned sample points are shown on **Figure 7**. Soil sampling will be performed in accordance with **SOP #3 in Appendix F**.

6.2.1 SAMPLE POINTS, LOCATIONS, TYPES, AND ANALYSES

Within each contaminated DU that is treated including the native soil at the bottom of the landfill area, discreet grab soil samples will be collected from 0-1 ft and 1-2 ft bgs using decontaminated stainless steel trowels (**Appendix F – SOP #3**). The grab samples from each depth interval within a DU will be composited into a single soil sample, specifically there will be one composite soil sample from the shallow interval (0-1 ft or 0-2 ft bgs) and one composite soil sample from the deeper interval (1-2 ft or bgs). The planned sample locations are shown on **Figure 7** and are summarized in **Table 6-3**.

Table 6-3 Confirmation Sample Locations Per Decision Unit

DECISION UNIT(S)	NUMBER OF LOCATIONS AND SAMPLE INTERVALS	TOTAL NUMBER OF SAMPLES AT EACH INTERVAL	TOTAL NUMBER OF COMPOSITE SAMPLES	COMMENTS
2, 4-5, 8, 13, 14, 18, 19, 20, 21, 30, 34, 35, 36, 57, and 62	80 locations (16 DUs x 5 locations) and 2 sample intervals	80	32	Near full DUs.
54, 55, 59, and 60	20 locations (4 DUs x 5 locations) and 2 sample intervals	20	8	Bottom of landfill excavation
12, 39, 41, 47-53, and 67	44 locations (11 DUs x 4 locations) and 2 sample intervals	44	22	Partial DUs
63	4 locations and 2 sample intervals	4	2	Partial DU due to landfill excavation
7, 22, 29, 31, 32, 33, 68, 70, and 71	27 locations (9 DUs x 3 locations) and 2 sample intervals	27	18	Partial DUs

DECISION UNIT(S)	NUMBER OF LOCATIONS AND SAMPLE INTERVALS	TOTAL NUMBER OF SAMPLES AT EACH INTERVAL	TOTAL NUMBER OF COMPOSITE SAMPLES	COMMENTS
56, 58, 64, 65	12 locations (4 DUs x 3 locations) and 2 Sample Intervals	12	8	Partial DUs due to landfill excavation
LANDFILL SOILS TREATMENT CELLS				
17, 18, and 27	6 locations (3 DUs x 2 locations) and 2 sample intervals	2	6	Partial DUs
31	4 locations and 2 sample intervals	4	2	Partial DU
28	5 locations and 2 sample intervals	5	2	Partial DU
38 and 43	8 locations (2 DUs x 4 locations) and 2 sample intervals	8	4	Partial DUs
39 and 41	6 locations (2 DUs x 3 locations) and 2 sample intervals	6	4	Partial DUs
44, 45, 46, and 47	20 locations (4 DUs x 5 locations) and 2 sample intervals	20	8	Near full DUs

A 4-ounce glass sample jar provided by Eurofins will be filled with composited soil. A total of 236 soil locations will be sampled, resulting in a total of 116 composite soil samples. Using a decontaminated trowel at each discreet sample location shown on **Figure 7**, scoops of soil will be obtained until the sample jar is approximately 75 percent full. Rocks will be removed from the soil. The jar will then be sealed and shaken until the soil is thoroughly mixed. A 10-gram aliquot obtained from the glass jar will then be screened for toxaphene in the field using Beacon Analytical Services immunoassay kits per **Appendix F – SOP #3.** Per the Analytical Approach provided in **Section 6.1.5.1**, all samples used for remediation confirmation will be analyzed by Eurofins for toxaphene, DDE, and DDT by EPA Method 8081A. Samples will be analyzed on a 10-day turnaround.

6.2.2 QUALITY CONTROL ACTIVITIES

Quality control activities and samples are discussed in the following subsections.

- **Equipment Decontamination.** Stainless steel trowels will be decontaminated following completion of sample locations within each DU. Equipment decontamination is described in **Appendix F – SOP #2.** To confirm equipment decontamination, three equipment blank samples will be collected. The equipment blank samples will be collected by pouring laboratory-grade deionized water over the decontaminated trowel and collecting the water in a 1-liter bottle for analysis of organochlorine pesticides by EPA Method 8081A.
- **Replicate Samples**. Ten replicate samples will be collected in the same manner as the primary samples and field-screened for toxaphene using the immunoassay kits. Three replicate samples will be submitted to Eurofins and analyzed for toxaphene, DDE, and DDT.

— **Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples**. A total of two soil samples will be designated for laboratory matrix spike/matrix spike duplicate analysis.

6.2.3 SPECIAL SAMPLE REQUIREMENTS

Immunoassay field screening of samples must be performed in an indoor and air-conditioned space. The indoor ambient temperature must be 18 degrees Celsius (°C) to 37°C or 64 degrees Fahrenheit (°F) to 81°F. WSP will discuss with Airport staff the availability and use of an office in the airport operations center to perform field screening and a refrigerator to keep samples cool.

6.2.4 ANALYTICAL METHODS REQUIREMENTS AND FIELD SAMPLING TABLE

The soil treatment area analytical method requirements are provided in **Table 6-4** and the soil treatment area field sampling table is provided as **Table 6-5**.

Table 6-4 Soil Treatment Analytical Method Requirements

ANALYTE	MATRIX	ANALYTICAL METHOD	LABORATORY NAME	SCREENING CRITERIA OR REGULATORY LEVEL	LABORATORY OR METHOD REPORTING LIMIT	UNITS OF REPORTING LIMIT
Toxaphene	Soil	4041	Field screen	5.0	2.0 and 10	ppm or mg/kg
Toxaphene	Soil	8081A	Eurofins	5.0	0.099	mg/kg
DDE	Soil	8081A	Eurofins	20	0.0049	mg/kg
DDT	Soil	8081A	Eurofins	20	0.0049	mg/kg

Table 6-5 Soil Treatment Field Sampling Table

MATRIX	ANALYTE AND METHOD	NO. OF SAMPLES	NO. OF DUPLICATES	NO. OF FIELD BLANKS	NO. MS/MSD	SAMPLE VOLUME	CONTAINER	PRESERVATION	HOLDING TIME
Soil	Toxaphene Field Screen	116	10	0	0	10 g[1]	4-oz[2] glass jar	4°C[3] ± 2°C	14 days to extract, analyze upon extraction
Soil	Toxaphene, DDE, DDT 8081B	116	10	0	2	4-oz[3]	4-oz glass jar	4°C ± 2°C	14 days to extract, analyze extract within 40 days – 3-day turnaround will be requested.
Water	Pesticides 8081B	0	0	3	0	1-liter	1-liter amber bottle	4°C ± 2°C	7 days to extract, analyze extract within 40 days

1. g – gram
2. oz – ounce

6.2.5 FIELD SAMPLING REQUIREMENTS

SOPs for the planned fieldwork are included in **Appendix F** and are cited in this RAP where applicable.

6.2.6 SAMPLE HANDLING AND CUSTODY REQUIREMENTS

Sample handling and custody requirements are provided in **Appendix F – SOP #4**. Soil samples to be composited to prepare field screening samples will be picked up by the field manager and taken to the office in the Chandler Municipal Airport. Based on the field screening results and per the Analytical Approach provided in **Section 6.1.5.1**, all soil samples used for remediation confirmation will be analyzed by Eurofins for toxaphene, DDE, and DDT by EPA Method 8081A. Samples will be analyzed on a 10-day turnaround.

6.2.7 FIELD INSTRUMENT, EQUIPMENT AND SUPPLIES; TESTING AND MAINTENANCE

The requirements for the Beacon Analytical Services immunoassay kits are provided in **Appendix D – SOP #3.**

6.2.8 ASSESSMENT/OVERSIGHT

Identification of problems related to technical performance will be the responsibility of City and WSP technical staff working on the project. The Sampling Team Leader will assess any problems that arise in the field and make modifications to technical procedures, if needed, and will communicate with the Project Manager and any technical staff. Any changes in technical procedures will be documented in field notes and highlighted in reports related to the project.

6.2.9 DATA REVIEW, VALIDATION, AND USABILITY

Data review, validation, and usability is discussed in detail in **Section 6.1.6.2**.

6.2.10 DOCUMENTATION AND RECORDS

Appropriate documentation including field notes and measurements will be recorded in a field notebook which will be maintained electronically in a field tablet by the WSP designated Sampling Team Leader. Field documentation and record procedures are provided in **Appendix F – SOP #5**. A field sampling form to record immunoassay toxaphene concentrations and corresponding laboratory results will also be completed electronically. Original copies of Chain of Custody, raw data, and analytical results will be maintained Eurofins. The WSP designated Sampling Team Leader will be responsible for summarizing daily activities, which will be submitted daily by email to the WSP PM and City PM and made available to VRP upon request. The summary will include the following:

- Name of Sampling Team Leader and Team Members;
- Number of soil samples collected;
- Locations of samples;
- On-site measurements made and results obtained at each location (including times);
- Disposition of all samples (where they were delivered for analysis);
- Photocopies of Chain of Custody;
- Noteworthy observations at each sampling location; and
- Field instrument calibration

The summary will also include the field sampling form completed to the date the summary is submitted. New samples will be highlighted.

6.2.11 DATA CERTIFICATION

WSP will sign a certification statement and must ensure that data quality meets project objectives. The final Removal Action Completion Report (RACR) stamped by a registered professional does not constitute certification. The following statement certifying data representativeness, comparability, completeness, and usability must be signed in the final RACR where the data are presented:

I, [name and professional registration] do certify:

a. Data are appropriate to address study objectives (methods, method detection limits [MDLs], parameters).

b. Data were collected in accordance with the project SAP/FSP.

c. Sample design (i.e., representativeness) was developed and executed according to professional standards for environmental work.

d. Field and laboratory QC meet objectives (duplicate reproducibility, spike recoveries, field, and lab blanks), appropriate data flags used in data tables, and unusable or rejected data are flagged appropriately.

e. Deviations or exceptions of any of the above are specifically noted in the body of the RACR.

7 REMOVAL ACTION SCHEDULE

This RAP is subject to a 30-day public comment period in accordance with Arizona Revised Statutes § 49-176(D). After approval of this RAP is received from the City and ADEQ VRP, a request for proposal including the removal action design will be submitted to qualified soil remediation subcontractors for bidding and scheduling purposes. The soil remediation contractor that represents the best value in regard to qualifications, schedule, and cost will be selected by WSP and approved by the City. WSP will then prepare the scope of work, schedule, and project budget based on the WSP rates provided in *State of Arizona Contract No. CTR055988, Assessment and Remediation of Hazardous and Regulated Substances and Materials*. The scope of work, schedule, and budget will be submitted for City Council approval. Upon City Council approval, a start date for the removal action will be scheduled. To allow for RAP approval, selection of the soil remediation subcontractor, preparation of the scope of work, budget, and schedule, and City Council approval, the tentative start date is January 2024. Based on the design presented in Section 5, up to six months may be required to complete field work. EN Rx estimates approximately two days will be required to treat each full cell. There are 28 full cells, equaling up to 56 days. There are 38 partial DUs. The average time to treat each partial DU is one day, or an additional 38 days. Therefore, 94 treatment days are estimated. The field work timeline is from setup/start to finish including soil treatment, post treatment watering for chemical reaction time, collection of post-treatment samples, and any possible re-treatment. The initial schedule is included as **Appendix I**. A revised schedule will be submitted to the City and VRP after the soil remediation contractor is scheduled.

8 REPORTING

8.1 PROGRESS TECHNICAL MEMOS

A Progress Technical Memo including a revised project schedule will be submitted monthly via email to the VRP Project Manager beginning at the start of the removal action. Progress reports will include a summary of Site activities for the previous month and including a list of DUs that have been treated, a summary of sampling and analysis, problems encountered, and actions taken to rectify such problems, the estimated percent remediation completed and anticipated activities for the next month. Based on the estimated three-month field program, four Progress Technical Memos will be submitted.

8.2 REMOVAL ACTION COMPLETION REPORT

Following confirmation that the remedial goals have been achieved and that the removal action has been completed, WSP will prepare a RACR. The report will provide a summary of field activities and will include analytical results for confirmation soil samples. The RACR will be submitted via email to the City for review, comment, and approval within 45 days of receipt of all laboratory analytical results. The schedule assumes 15 working days for the City to review the RACR. After City approval, the final RACR will be submitted to the ADEQ VRP and will allow 45 calendar days for VRP review and comment. If changes are requested, a Revised RACR will be submitted within 14 days of receipt of changes/comments from the VRP.

8.3 NO FURTHER ACTION REPORT

Upon achieving the remediation levels and controls determined pursuant to Arizona Revised Statutes (A.R.S.) §49-175(B), the City will request ADEQ provide a determination that no further action (NFA) is needed for the Site. This is done by completing and submitting the VRP NFA Report Form. The NFA Report summarizes the RACR and provides the Draft NFA Public Notice.

BIBLIOGRAPHY

- Arizona Department of Environmental Quality (ADEQ). 2013, Revised 2017. VRP Work Plan Checklist.
- ADEQ. 2021. VRP Data Quality Plan for Work Plan/SAP Development.
- Dames & Moore, 1991. Chandler Municipal Airport Expansion Project, prepared by Dames & Moore, June 10.
- United States Environmental Protection Agency (EPA). 2006. *Guidance on Systematic Planning Using the Data Quality Objectives Process*. EPA/240/B-06/001. February
- Wood Environment & Infrastructure Solutions, Inc. (Wood E&IS). 2022. Engineering Evaluation/Cost Analysis Report, K&K Aerial Applicator Site, Chandler, Arizona. September 13, 2022

APPENDIX

FIGURES

Job No.	1420212046
PM:	JNC
Date:	10/12/2022
Scale:	1" = 1000'

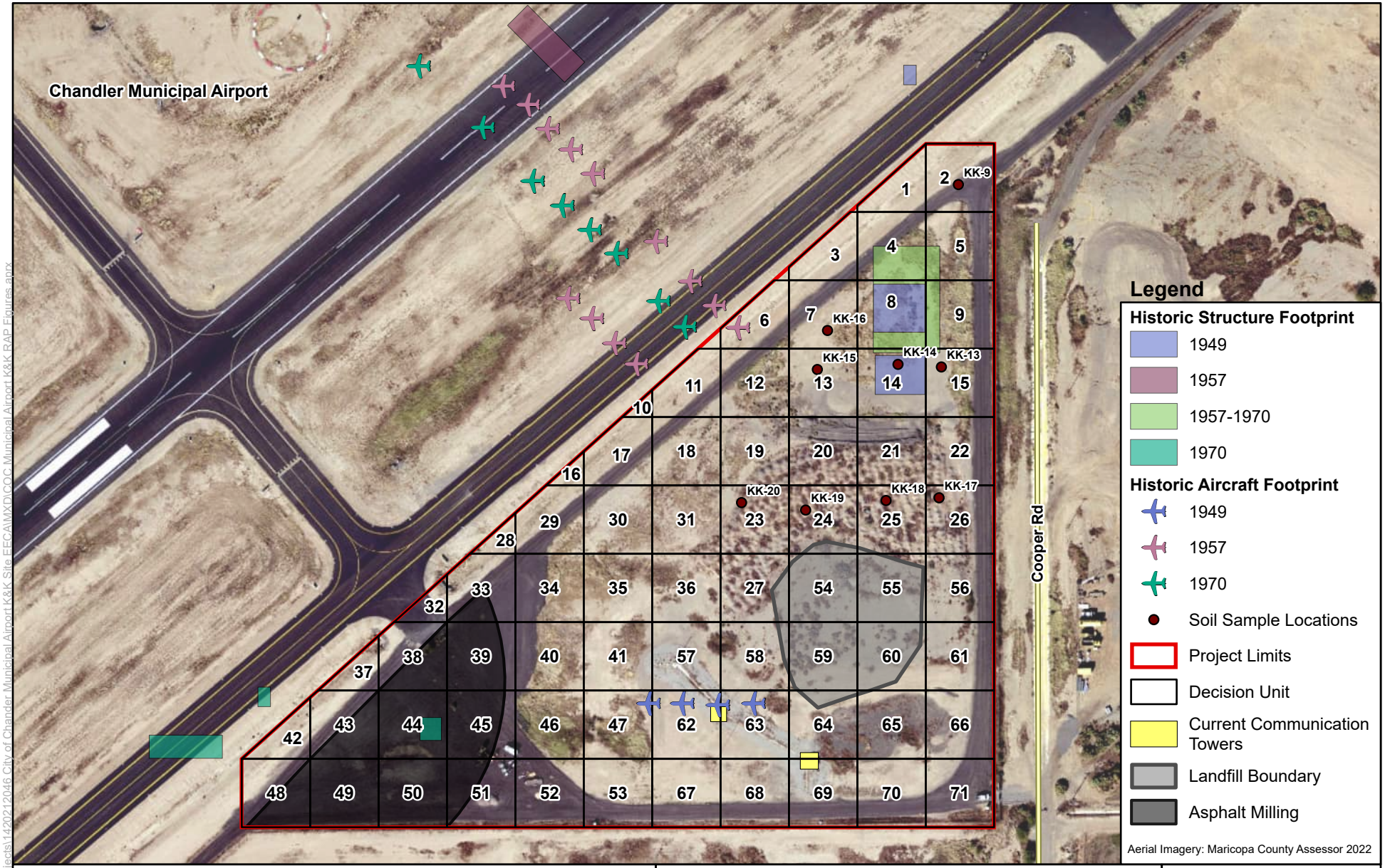
N

City of Chandler Municipal Airport
K & K Aerial Applicator Site
Chandler, Arizona

Site Location

FIGURE 1

wsp



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Scale:	1" = 200 feet

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City of Chandler Municipal Airport
K & K Aerial Applicator Site
Chandler, Arizona

Locations of Decision Units and Current and Historic Features

FIGURE **2**

wsp

Path: Y:\Projects\2021 Projects\1420212046 City of Chander Municipal Airport K&K Site EEC\MXD\COC Municipal Airport K&K RAP Figures.aprx

Legend

- Project Limits
- Soil Boring Location
- Test Pit Location
- Decision Unit
- Landfill Boundary

Toxaphene Concentration

- 5.0 mg/kg (RSRL) *322,743.73 sqft*
- 16.0 mg/kg (NRSRL) *171,345.97 sqft*

Aerials2022

Notes:

SB-19	Soil Boring Identification
2.8 – 16.8	Toxaphene immunoassay result in mg/kg
4.7	Toxaphene laboratory result in mg/kg (if applicable)
	Bold results exceed RSRL (5.0 mg/kg)
	Bold and Italic results exceed NRSRL (16.0 mg/kg)
TP-1	Test Pit Identification
mg/kg	milligrams per kilogram
Sqft	Square feet
RSRL	Arizona Residential Soil Remediation Level
NRSRL	Arizona Non-Residential Soil Remediation Level

Aerial Imagery: Maricopa County Assessor 2022

0 125 250 Feet

N

City of Chandler Municipal Airport
K & K Aerial Applicator Site
Chandler, Arizona

Figure **3**

Extent of Toxaphene Contamination in Soil

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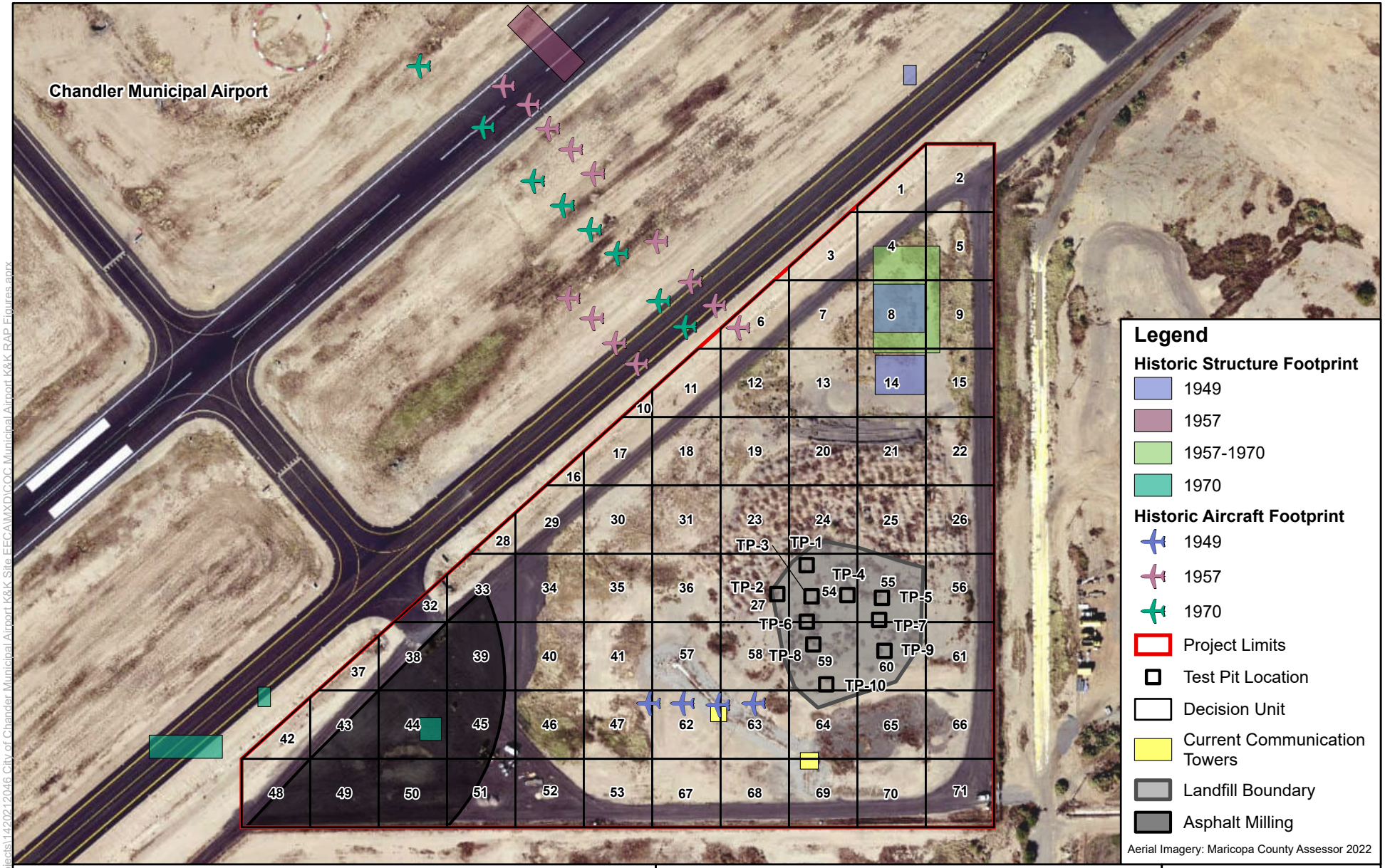

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City of Chandler Municipal Airport
K & K Aerial Applicator Site
Chandler, Arizona

Test Pit Locations and Current and Historic Features

FIGURE **4**

wsp

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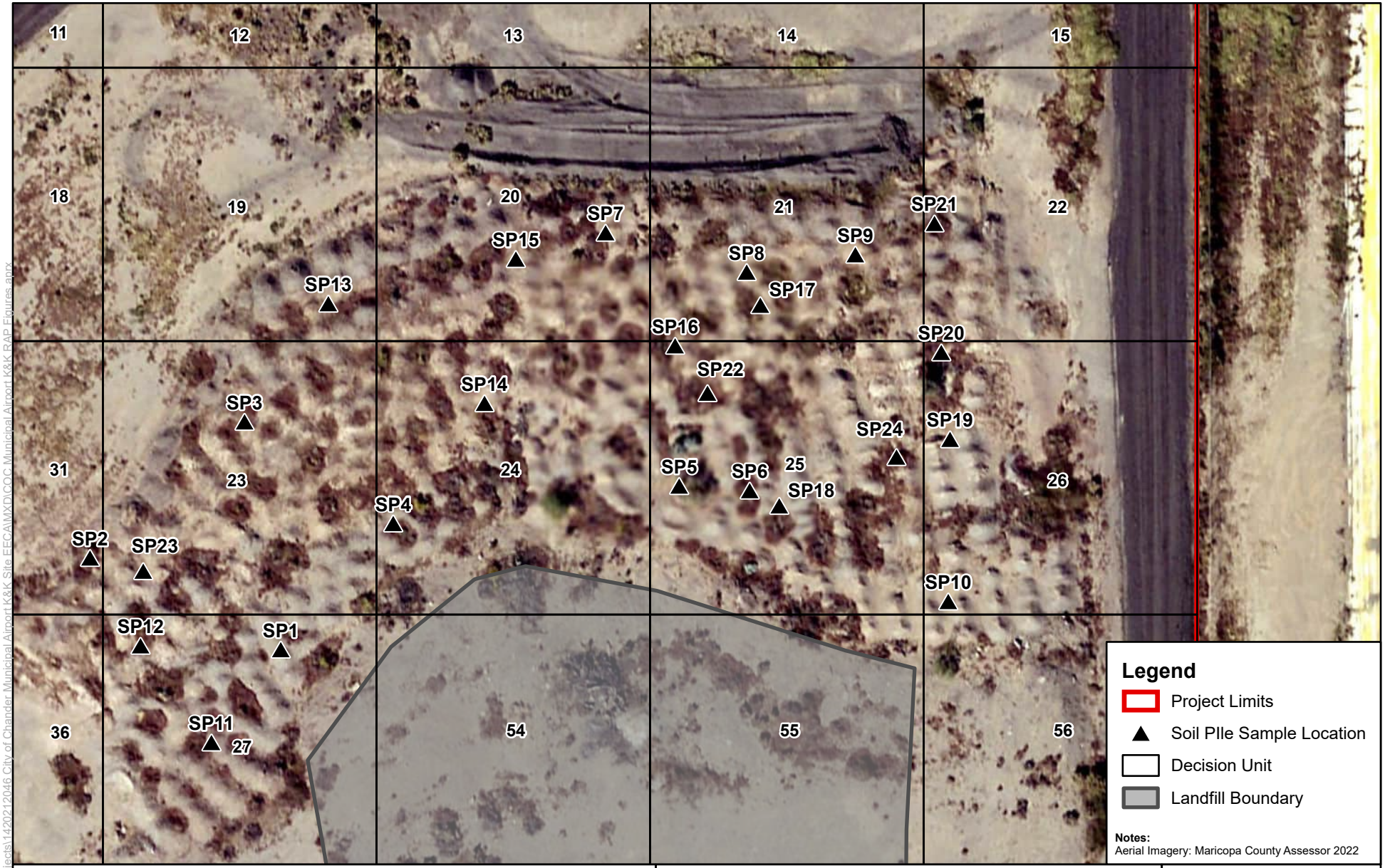

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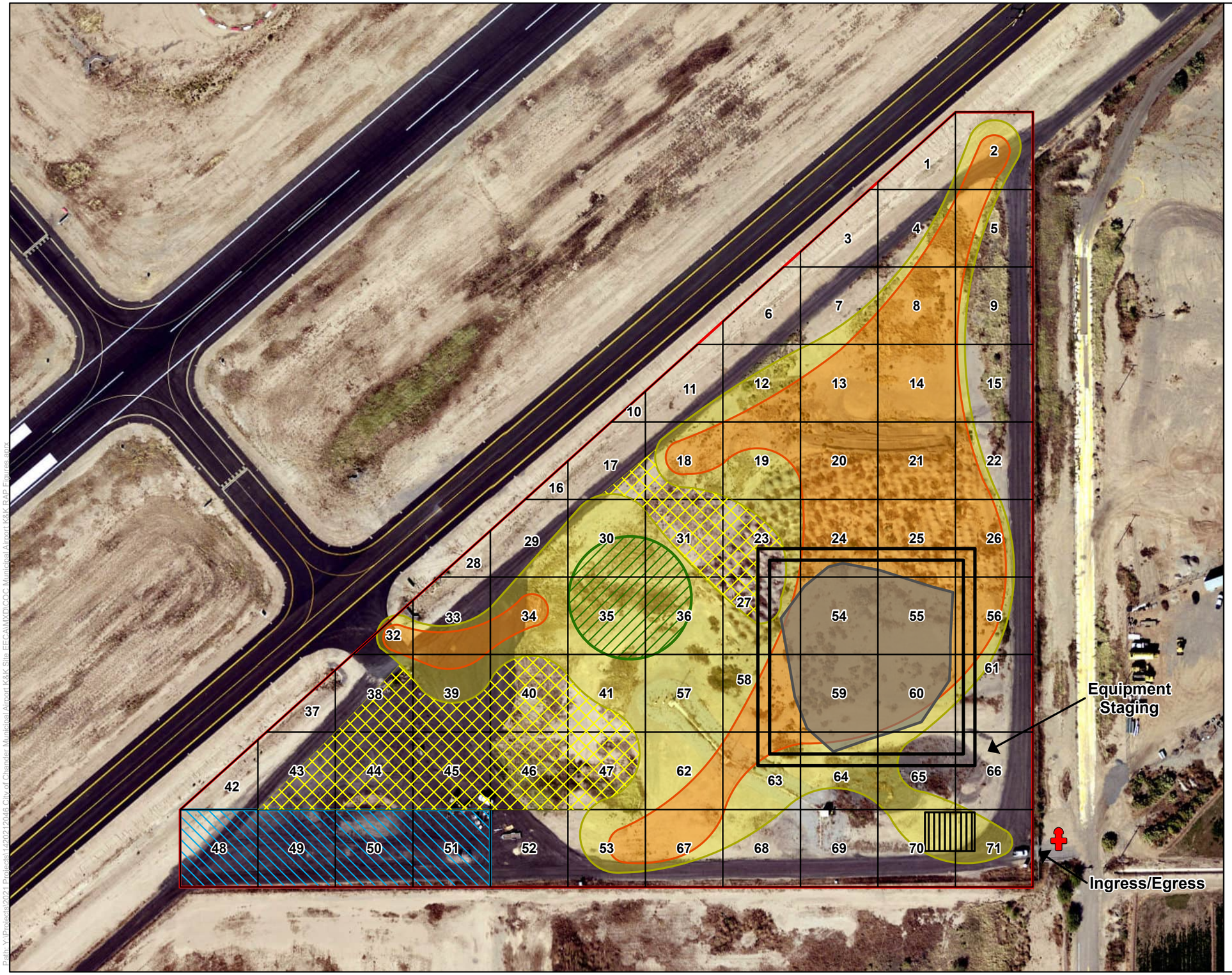
City of Chandler Municipal Airport
K & K Aerial Applicator Site
Chandler, Arizona

Soil Pile Sample Locations

FIGURE
5

wsp



Legend

- Project Limits
- Decision Unit
- Landfill Boundary
- Excavation Area
- Water Supply (Fire Hydrant)
- Tire Wash/ Decontamination
- Landfill Contents Segregation Area
- Non-Contaminated Soil Stockpile Area
- Landfill Soil Treatment Area

Toxaphene Concentration

- 5.0 mg/kg (RSRL) *322,743.73 sqft*
- 16.0 mg/kg (NRSRL) *171,345.97 sqft*
- Excavation Area

Notes:

1	Decision Unit Identification
mg/kg	milligrams per kilogram
Sqft	Square feet
RSRL	Arizona Residential Soil Remediation Level
NRSRL	Arizona Non-Residential Soil Remediation Level

Aerial Imagery: Maricopa County Assessor 2022

0 125 250 Feet

N

City of Chandler Municipal Airport
K & K Aerial Applicator Site
Chandler, Arizona

Figure **6**

Excavation, Soil Stockpile, and Staging Areas

Job No.	1420212046
PM:	JNC
Date:	12/4/2023
Scale:	1"= 125 feet

Path: Y:\Projects\2021 Projects\1420212046 City of Chander Municipal Airport K&K Site EECA\MXD\COC Municipal Airport K&K RAP Figures.aprx

Legend

- Project Limits
- Decision Unit
- Confirmatory Grab Soil Sample Location
- Confirmatory Landfill Excavation Grab Soil Sample Location
- Landfill Boundary
- Landfill Soil Treatment Area
- Excavation Area

Toxaphene Concentration

- 5.0 mg/kg (RSRL) *322,743.73 sqft*
- 16.0 mg/kg (NRSRL) *171,345.97 sqft*

Notes:

1	Decision Unit Identification
mg/kg	milligrams per kilogram
Sqft	Square feet
RSRL	Arizona Residential Soil Remediation Level
NRSRL	Arizona Non-Residential Soil Remediation Level

Aerial Imagery: Maricopa County Assessor 2022

0 125 250 Feet

N

City of Chandler Municipal Airport
K & K Aerial Applicator Site
Chandler, Arizona

Figure **7**

Confirmation Soil Sample Locations

Job No.	1420212046
PM:	JNC
Date:	12/4/2023
Scale:	1"= 125 feet

APPENDIX

A ADEQ COMMENTS TO RAP

Sent via Email

September 1, 2023
VRP 24-010

City of Chandler – Management Services Department
Mr. Jon Sherrill
Post Office Box 4008, MS 607
Chandler, Arizona 85224-4008

Re: Review of Removal Action Plan
Former K&K Aerial Applicator
2700 South Cooper Road
Chandler, Arizona 85286
Site Code: 514031-00

Dear Mr. Sherrill:

The Arizona Department of Environmental Quality (ADEQ), Voluntary Remediation Program (VRP) has reviewed the July 26, 2023 *Removal Action Plan* (the Work Plan) prepared by WSP USA Environment & Infrastructure Inc. (WSP) on behalf of the City of Chandler for the Former K&K Aerial Applicator site (the Site). The Work Plan proposes in-situ treatment, excavation, and disposal of landfill materials in addition to collection of post-treatment/excavation soil confirmation samples at the Site. The VRP has the following comments that must be addressed in a revised Work Plan:

General Comments

1. Please note the VRP did not evaluate Section 4 and has no comment on the remedy selection.
2. The VRP is unable to determine whether the vertical extent of contamination across the Site has been characterized. A revised Work Plan should include the following:
    a. A table of historical sampling results.
    b. A figure depicting historical sampling locations and results.
    c. A cross-section figure depicting historical sampling locations and results.
    d. A discussion and conclusion regarding vertical extent definition and/or any data gaps that could be filled during remediation.
3. The VRP requests the City of Chandler propose contingency sampling and analysis should unexpected materials be found during landfill excavation. Please add this to a revised Work Plan.
4. The VRP does not concur with the use of immunoassay tests for post-treatment/excavation soil confirmation samples in each Decision Unit because they are generally used for field screening, not for confirmation analysis, and are not an approved Arizona Department of Health Services (ADHS) method. A revised Work Plan should propose laboratory analysis of post-

treatment/excavation soil confirmation samples from an accredited ADHS fixed-based laboratory to calculate the concentrations of contaminants of concern (COCs) remaining in soil.

Specific Comments

1. Section 4.0 states that the contents of the landfill are being disposed. As such, additional samples of the waste sent for disposal should be collected. The VRP recommends collecting one composite sample of soil for each roll off or per haul truck.
2. In Section 4.0, paragraph 3 states the shallow soils will be treated as containing P123 listed waste. Therefore, for any soil residues excavated and sent to a hazardous waste landfill, the treatment must meet Land Disposal Restrictions for non-wastewaters. The Work Plan proposes use of the Area of Contamination policy, so the City of Chandler may not generate any soils for off-site disposal and may not be an issue. However, rinsates that are generated from the cleanup of equipment should be sampled, and a contained-out demonstration made to show that toxaphene is not present at levels above Maximum Contaminant Levels, the most stringent use scenario for water that is generated.
3. Section 5.2 states that the landfill excavation area will remain open following remediation and will be backfilled during future site construction. Please provide more detail on the backfill source and sampling protocol.
4. Section 5.2 should state a qualified person will oversee the landfill excavation and evaluate the material removed is disposed of appropriately. For example, if friable asbestos is discovered, it must be disposed in certain designated landfills; or drums of reagents would have to be sampled and perhaps managed as hazardous waste requiring the City of Chandler to obtain an EPA ID and the waste manifested offsite.
5. In Section 5.3, please provide the constituent makeup of the amendments being utilized, in addition to any by-products and end products of the reactions to determine what residuals may be present and if additional constituents should be monitored or sampled after treatment (e.g. residual amendments, by-products, pH, metals).
6. Section 6.1.3.1 states that toxaphene, DDT, and DDE are Contaminants of Potential Concern (COPC). Historical sampling results has demonstrated these contaminants have been confirmed through laboratory analysis to be present at the Site at levels exceeding residential Soil Remediation Levels, therefore they should be considered COCs.
7. The VRP requests the City of Chandler add metals analysis to Section 6.2 for the landfill portion of the Site as no historic analysis was conducted.
8. The progress reports described in Section 8.1 can be submitted in the form of a simple email sent to the VRP at the beginning of the month, describing the activity performed in the previous month and what is expected to be completed in the coming month.
9. Please note the Work Plan is subject to a 30-day public comment period in accordance with Arizona Revised Statutes § 49-176(D). This should be added to Sections 1.3 and 7 of the Work Plan.

How to Respond and Submit

The City of Chandler shall revise the Work Plan addressing the comments herein. Please submit a redline/strikeout revised Work Plan by October 2, 2023 via email.

Please contact me if you would like to hold a meeting to discuss this letter or have any questions. I can be reached at osuch.nichole@azdeq.gov or 602-771-4847.

Sincerely,

Nichole Osuch

Nichole Osuch, PMP
Project Manager
Voluntary Remediation Program

Cc: Mr. James Clarke, WSP – *via email*

ARIZONA DEPARTMENT
OF
ENVIRONMENTAL QUALITY

Katie Hobbs
Governor

Karen Peters
Cabinet Executive Officer
Executive Deputy Director

Sent via Email

November 17, 2023
VRP 24-051

City of Chandler – Management Services Department
Mr. Jon Sherrill
Post Office Box 4008, MS 607
Chandler, Arizona 85224-4008

Re: Review of Revised Removal Action Plan
Former K&K Aerial Applicator
2700 South Cooper Road
Chandler, Arizona 85286
Site Code: 514031-00

Dear Mr. Sherrill:

The Arizona Department of Environmental Quality (ADEQ), Voluntary Remediation Program (VRP) has reviewed the October 16, 2023 *Revised Removal Action Plan* (the Revised Work Plan) prepared by WSP USA Environment & Infrastructure Inc. (WSP) on behalf of the City of Chandler for the Former K&K Aerial Applicator site (the Site). The Work Plan proposes in-situ soil treatment, excavation, and disposal of landfill materials in addition to collection of post-treatment/excavation soil confirmation samples at the Site. The VRP has the following comment that must be addressed in a revised Work Plan:

Section 3.3 states that 21 soil samples were collected from the soil piles of unknown origin. Out of these 21 samples, only 10 of the 21 were field screened for toxaphene using immunoassay kits. Of the 10 samples, only three were sent to a fixed based laboratory for toxaphene analysis where laboratory analytical results did not correlate to immunoassay kit results. The presence of toxaphene, albeit at low concentrations, suggest these soils have been impacted. The VRP now understands that these soil piles will be used at the Site to backfill the landfill area after material removal, however, only three samples with analytical results from a fixed based laboratory from approximately 4,200 cubic yards of soil are inadequate to characterize pesticides in the soil piles or approve their use as backfill. Therefore, the VRP requests the City of Chandler collect an additional 21 random, four-part composite samples from the soil piles and send to a fixed based laboratory for pesticide analysis (EPA Method 8081). The additional soil samples will provide confirmation that the City of Chandler's proposal to use these soil piles as backfill for the landfill area is appropriate and meet applicable residential Soil Remediation Levels in support of a No Further Action determination.

Recommendation

The VRP recommends the soil pile samples are collected prior to removal and stockpiling in the southwest portion of the Site, as stated in Section 5.2.

How to Respond and Submit

The City of Chandler shall revise the Work Plan addressing the comment above. The City of Chandler may send an email acknowledging the comment and that the sampling will be incorporated into a final revised Work Plan. Please send an electronic copy of the final revised Work Plan via email to my attention.

Please contact me if you would like to hold a meeting to discuss this letter or have any questions. I can be reached at osuch.nichole@azdeq.gov or 602-771-4847.

Sincerely,

Nichole Osuch

Nichole Osuch, PMP
Project Manager
Voluntary Remediation Program

Cc: Mr. James Clarke, WSP – *via email*

APPENDIX

B WSP RESPONSE TO ADEQ COMMENTS

RESPONSE TO ADEQ COMMENTS DATED SEPTEMBER 01, 2023
REMOVAL ACTION PLAN
FORMER K&K AERIAL APPLICATOR
2700 S. COOPER ROAD, CHANDLER, AZ 85286
ADEQ VRP SITE CODE: 514031-00

Item	Page(s)	Section	Paragraph(s)	ADEQ Comment	WSP/Chandler Response to Comment (RTC)
General Comments					
1				Please note the VRP did not evaluate Section 4 and has no comment on the remedy selection.	Acknowledged
2	4-26	3.0		The VRP is unable to determine whether the vertical extent of contamination across the Site has been characterized. A revised Work Plan should include the following: a. A table of historical sampling results. b. A figure depicting historical sampling locations and results. c. A cross-section figure depicting historical sampling locations and results. d. A discussion and conclusion regarding vertical extent definition and/or any data gaps that could be filled during remediation.	It is known that organochlorine pesticides that include the compounds of concern toxaphene, DDE and DDT are not vertically mobile in soil. An investigation of the Site was performed by RW Beck and Dames & Moore in 1991. A copy of the Dames & Moore report dated June 10, 1991 that includes soil sample locations and analytical results is included as Appendix D to the RAP. On-site boring KK-15 was drilled and sampled to a depth of 15 feet. The location is shown on Figure 2 of the RAP. Off-site borings at KK-3 KK-5, KK-11were drilled to a depth of 15 feet at off-Site locations that were detected with elevated concentrations of toxaphene. The boring at off-Site location KK-12 was drilled, as requested by ADEQ, to a depth of 99 feet or to ground water, whichever occurred first. Off-Site borings KK-3, KK-5, KK-11, and KK-12 were drilled and sampled to the west of the Site where the current runways and taxiways are located. Soil samples were collected over the following intervals: 0"-8", 8"-16", 1.5'-2.0', 4.5'-5.0', and 14.5'-15.0'. The largest concentrations of Toxaphene, DDT and DDE were observed at off-Site sample point KK-12 in the R. W. Beck investigation. In anticipation of possibly encountering contamination at greater depths at this point, samples were also collected at 19.5'-20' and 29.5'-30' from KK-12. Table 3-2 has been added to the RAP that includes the analytical results for the soil

Item	Page(s)	Section	Paragraph(s)	ADEQ Comment	WSP/Chandler Response to Comment (RTC)
					borings. Based on the results of the investigation, Dames & Moore concluded that the toxaphene, DDT, and DDE soil contamination did not extend beyond two feet deep. The results of the 1991 site investigation were used to design the Engineering Evaluation/Cost Analysis (EECA) investigation performed by WSP (formerly Wood). A copy of the EECA Report will be identified as a Appendix to the RAP. The EECA Report includes the soil sample analytical data collected during the EECA including tables of field screening and laboratory analytical results and maps showing sample locations. To address the ADEQ comment, the RAP has been revised to include the following: • Figure 2 of the RAP has been revised to show the on-Site R.W Beck/Dames & Moore soil sample/boring locations. • The following tables: o Table 3-1 presenting the EECA investigation immunoassay sample results and corresponding laboratory toxaphene results. o Table 3-2 presenting the RW Beck/Dames & Moore and EECA sample laboratory pesticide results. o Table 3-3 presenting polynuclear aromatic hydrocarbon analytical results for soil samples collected during the EECA investigation. o Table 3-4 presenting metals analytical results for soil samples collected during the EECA investigation.

Item	Page(s)	Section	Paragraph(s)	ADEQ Comment	WSP/Chandler Response to Comment (RTC)
					• A discussion and conclusion regarding vertical extent definition and/or any data gaps that could be filled during remediation. • A cross section showing a 2-feet deep soil thickness across the area is not provided.
3	32 19	5.2 6.1.5.1	1 & Bullet 4a	The VRP requests the City of Chandler propose contingency sampling and analysis should unexpected materials be found during landfill excavation. Please add this to a revised Work Plan.	During the investigation portion of the EECA, 10 test pits were excavated through the landfill to identify the demolition material. The sampling approach is described in Section 4.5.2 of the EECA Report, pages 24-25. Appendix F of the EECA Report is a photolog of the landfill investigation showing materials that were encountered. Section 4.6.2 of the EECA, page 27 provides the analyses that were performed on soil below and within the landfill and on the landfill demolition materials. Section 5.2 of the EECA, pages 30-32 provide the results of the landfill investigation. The demolition debris consists predominantly of broken concrete. No unexpected materials should be encountered during the landfill excavation. However, as a contingency, the RAP is revised to assume that 10-20 additional materials are found and that 30-60 asbestos samples will be collected.
4	37 39 43 5	6.1.1 6.1.5.2 6.2.1 SOP #3	2 2 2 3	The VRP does not concur with the use of immunoassay tests for post-treatment/excavation soil confirmation samples in each Decision Unit because they are generally used for field screening, not for confirmation analysis, and are not an approved Arizona Department of Health Services (ADHS) method. A revised Work Plan should propose laboratory analysis of post-treatment/excavation soil confirmation samples from an accredited ADHS fixed-based laboratory to calculate the concentrations of contaminants of concern (COCs) remaining in soil.	Field screening methods are typically used for remediation confirmation because real-time results are obtained at lower cost than fixed-base laboratory analyses. This includes use of photoionization detectors (PIDs) for VOCs, field gas chromatography (GC), x-ray fluorescence (XRF) for metals, and immunoassay for several contaminants including chlorinated pesticides such as toxaphene. This allows rapid decision-making in the field regarding re-treatment. Field screening results should be confirmed using a selected number of fixed-base laboratory analyses. To address the VRP concerns

Item	Page(s)	Section	Paragraph(s)	ADEQ Comment	WSP/Chandler Response to Comment (RTC)
					and to obtain a letter of No Further Action, all remediation confirmation samples will be analyzed by Pace for pesticides by EPA Method 8081A. Pace is an accredited ADHS fixed-base analytical laboratory.
Specific Comments					
1	28 32 32	4.0 5.2 5.2	Bullet 4 1 Item 4a	Section 4.0 states that the contents of the landfill are being disposed. As such, additional samples of the waste sent for disposal should be collected. The VRP recommends collecting one composite sample of soil for each roll off or per haul truck.	According to General Comment 1, ADEQ did not evaluate Section 4. However, to respond to this comment, Bullet 4 on Page 9 refers to the demolition materials and not soil used to bury those materials. This is clarified on Page 10, last Bullet and on Page 14, Section 5.2, Item 4. The demolition debris, which consists predominantly of broken concrete, will be segregated from the soil by screening. This material was analyzed as described in General Comment RTC #3. No impacted soil will be disposed off-site. The soil will be treated using the EN Rx reagent. No changes are made to the RAP. As provided in RTC to General Comment #3, additional samples will be collected for asbestos should additional materials be encountered. The RAP has been revised to include a qualified Asbestos Hazard Emergency Response Act (AHERA) building inspector to oversee excavation of the landfill and that additional samples may be collected for asbestos analysis.
2				In Section 4.0, paragraph 3 states the shallow soils will be treated as containing P123 listed waste. Therefore, for any soil residues excavated and sent to a hazardous waste landfill, the treatment must meet Land Disposal Restrictions for non-wastewaters. The Work Plan proposes use of the Area of Contamination policy, so the City of Chandler may not generate any soils for off-site disposal and may not be an issue. However, rinsates that are generated from the cleanup of equipment should be sampled, and a contained-out demonstration made to show that toxaphene is not present at levels above	Because the toxaphene was released to the soil as a result of mixing, spillage, and equipment washdown and not applied as a pesticide per manufacturers specifications, it is classified as a P123 listed waste. This means that impacted soil that is disposed off-site must be sent to a hazardous waste landfill. This includes any residual soil from equipment decontamination. Therefore, residual soil from equipment decontamination will be treated on-site and will not leave the site. The same will be done with residual rinsates resulting from decontamination of equipment. The rinsates will either be allowed to

Item	Page(s)	Section	Paragraph(s)	ADEQ Comment	WSP/Chandler Response to Comment (RTC)
				Maximum Contaminant Levels, the most stringent use scenario for water that is generated.	evaporate or will be placed on soil undergoing treatment. No rinsates will be disposed off-site. It should be noted that toxaphene is not readily soluble in water. No changes are made to the RAP.
3				Section 5.2 states that the landfill excavation area will remain open following remediation and will be backfilled during future site construction. Please provide more detail on the backfill source and sampling protocol.	This is correct. There are specific soil compaction specifications required for airport operations. Therefore, the landfill excavation will be backfilled to the designed soil compaction specifications during future site construction. The backfill soil may be obtained from treated on-site soils, clean on-site soils, or imported soil. No changes are made to the RAP.
4	32 32	5.2 5.2	1 Item 4a	Section 5.2 should state a qualified person will oversee the landfill excavation and evaluate the material removed is disposed of appropriately. For example, if friable asbestos is discovered, it must be disposed in certain designated landfills; or drums of reagents would have to be sampled and perhaps managed as hazardous waste requiring the City of Chandler to obtain an EPA ID and the waste manifested offsite.	As indicated in the RTC to General Comment #3, 10 test pits were excavated through the landfill during the EECA investigation to evaluate if the materials contained asbestos or hazardous materials. As indicated in Section 5.2 of the EECA Report, the landfill materials consisted of an estimated 50% soil and 50% demolition debris made up predominantly of broken concrete. Forty-eight samples were analyzed for asbestos, which was not present. No other potential hazardous materials were identified or observed in the test pits. The soil is characterized as impacted with toxaphene. Therefore, the soil will be segregated from the construction debris and treated using the EN Rx reagent. However, The RAP has been revised to include a qualified asbestos investigator to oversee excavation of the landfill. If ACM is encountered, it will be disposed in a designated landfill. Additionally, samples of the materials will be analyzed to meet landfill requirements. This will likely require analysis of samples for the presence of toxaphene.
5	33	5.3.2	1-3	In Section 5.3, please provide the constituent makeup of the amendments being utilized, in addition to any by-products and end products of the reactions to determine what residuals may be	The exact product constituents are proprietary. The only two metals/elements that are present are sodium (Na) and chloride (Cl). Product safety data sheets (SDSs) for the SSO and Synergist-D are included in

Item	Page(s)	Section	Paragraph(s)	ADEQ Comment	WSP/Chandler Response to Comment (RTC)
				present and if additional constituents should be monitored or sampled after treatment (e.g. residual amendments, by-products, pH, metals).	the revised RAP as Appendix H. For the cells expected to have the highest COC concentrations, sodium hydroxide (NaOH) may be added as a pH buffer. Therefore, a SDS for NaOH is also included in the revised RAP as Appendix H. There are no other harmful byproducts. Oxidation is viewed to be completed and the residuals are just the Na and Cl, and the hydrogen peroxide is lost as oxygen and water. The pH of the Synergist-D is 3 to 4 (depends how it is mixed), and the SSO has a pH of 10. Because of the concentrations of the amendments needed at the site, we expect the soil to initially have high pH, Na, and Cl until well mixed into each table. For instance, 0-8 inches gets a stronger treatment but is blended into 8-24 inches to dilute Na and Cl. Information on the EN Rx reagent has been added to Section 5.3.2 of the Revised RAP. A statement has also been included to discuss potential production of by-products and/or end products.
6	37 19	6.1.1 6.1.3.1	2 1	Section 6.1.3.1 states that toxaphene, DDT, and DDE are Contaminants of Potential Concern (COPC). Historical sampling results has demonstrated these contaminants have been confirmed through laboratory analysis to be present at the Site at levels exceeding residential Soil Remediation Levels, therefore they should be considered COCs.	Agreed. This is changed to contaminants of concern (COCs) in the revised RAP
7	38	6.1.5.1	3	The VRP requests the City of Chandler add metals analysis to Section 6.2 for the landfill portion of the Site as no historic analysis was conducted.	As discussed in Section 5.2.3 of the EECA Report, 17 soil samples were collected from the landfill and analyzed for metals. As shown in Table 3-4 included in the Revised RAP, metals were not detected above their respective RSRLs or GPLs. As indicated in Section 5.2.6 of the EECA Report, five items with painted surfaces were found. Paint chip samples were analyzed for the presence of lead-based paint. Painted materials are accepted by

Item	Page(s)	Section	Paragraph(s)	ADEQ Comment	WSP/Chandler Response to Comment (RTC)
					construction/demolition debris landfills. As indicated previously, the landfill materials consist predominantly of broken concrete. Section 6.2 is associated with the remediation confirmation samples. Therefore, Section 6.2 has not been revised. However, a statement has been added to Section 6.1.5.1 to indicate that samples of the landfill demolition debris will be analyzed per landfill acceptance criteria.
8				The progress reports described in Section 8.1 can be submitted in the form of a simple email sent to the VRP at the beginning of the month, describing the activity performed in the previous month and what is expected to be completed in the coming month.	Agreed. No change required for the RAP.
9	2 47	1.3 7	2 1	Please note the Work Plan is subject to a 30-day public comment period in accordance with Arizona Revised Statutes § 49-176(D). This should be added to Sections 1.3 and 7 of the Work Plan.	This is added to Sections 1.3 and 7 of the Revised RAP. Please note that the 30-day public comment period is included in the schedule attached as Appendix D.

RESPONSE TO ADEQ COMMENTS DATED NOVEMBER 17, 2023
REMOVAL ACTION PLAN
FORMER K&K AERIAL APPLICATOR
2700 S. COOPER ROAD, CHANDLER, AZ 85286
ADEQ VRP SITE CODE: 514031-00

Item	Page(s)	Section	Paragraph(s)	ADEQ Comment	WSP/Chandler Response to Comment (RTC)
General Comments					
1	9 33	3.3.1 5.2	2 Item 1	Section 3.3 states that 21 soil samples were collected from the soil piles of unknown origin. Out of these 21 samples, only 10 of the 21 were field screened for toxaphene using immunoassay kits. Of the 10 samples, only three were sent to a fixed based laboratory for toxaphene analysis where laboratory analytical results did not correlate to immunoassay kit results. The presence of toxaphene, albeit at low concentrations, suggest these soils have been impacted. The VRP now understands that these soil piles will be used at the Site to backfill the landfill area after material removal, however, only three samples with analytical results from a fixed based laboratory from approximately 4,200 cubic yards of soil are inadequate to characterize pesticides in the soil piles or approve their use as backfill. Therefore, the VRP requests the City of Chandler collect an additional 21 random, four-part composite samples from the soil piles and send to a fixed based laboratory for pesticide analysis (EPA Method 8081). The additional soil samples will provide confirmation that the City of Chandler's proposal to use these soil piles as backfill for the landfill area is appropriate and meet applicable residential Soil Remediation Levels in support of a No Further Action determination. <u>Recommendation</u> The VRP recommends the soil pile samples are collected prior to removal and stockpiling in the	Acknowledged. Twenty 4-part composite samples were collected from the soil pile area on 11/30/23 and submitted to Pace Analytical for analysis of organochlorine pesticides by EPA Method 8081A. The results were received on 12/13/23. The only organochlorine pesticides detected were toxaphene in one sample and 4,4-DDE in eight samples. The reported concentrations were well below the 10^{-5} RSRLs for toxaphene (5.0 mg/kg) and 4,4-DDE (20 mg/kg. As requested, the additional sampling and results are included in Section 3.3.1 of the Final Revised RAP. No changes are made to the soil pile management plan provided in Section 5.2 of the RAP.

Item	Page(s)	Section	Paragraph(s)	ADEQ Comment	WSP/Chandler Response to Comment (RTC)
				southwest portion of the Site, as stated in Section 5.2. <u>How to Respond and Submit</u> The City of Chandler shall revise the Work Plan addressing the comment above. The City of Chandler may send an email acknowledging the comment and that the sampling will be incorporated into a final revised Work Plan. Please send an electronic copy of the final revised Work Plan via email to my attention.	

APPENDIX

C EXAMPLE PUBLIC NOTICE SIGN

ENVIRONMENTAL REMEDIATION NOTICE

Voluntary Remediation Site Program Site

Site Code 514031-00

Project Start Date: April 2024

The City of Chandler Is Conducting Environmental Remediation.

This work is performed under the

Arizona Department of the Environmental Quality

Voluntary Remediation Program.

For more information please contact:		
Site Contact	Jon Sherrill	(480) 782-2387
ADEQ Contact	Nichole Osuch	(602) 771-4847
Remediation Contact	Jim Clarke, WSP	(602) 526-7954

APPENDIX

D DAMES & MOORE 1991 REPORT

APPENDIX

E WOOD EE/CA REPORT

APPENDIX

F PACE ANALYTICAL REPORT

ANALYTICAL REPORT

December 13, 2023

WSP (Formely Wood E&I)-Phoenix, AZ

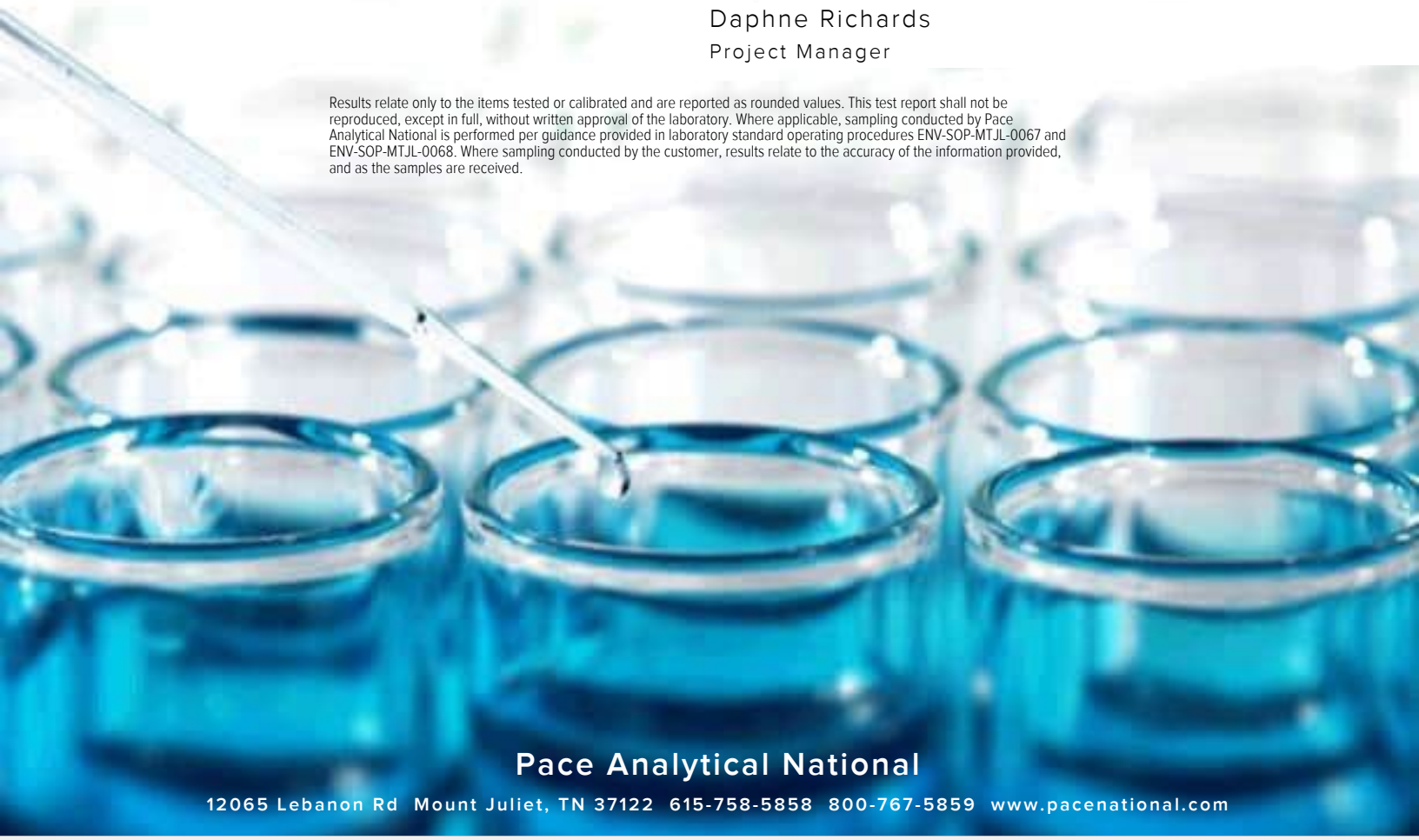
Sample Delivery Group:	L1683747
Samples Received:	12/02/2023
Project Number:	
Description:	K&K

Report To: Jim Clarke
4600 East Washington Street, Ste 600
Phoenix, AZ 85034

Entire Report Reviewed By:

Daphne R Richards

Daphne Richards
Project Manager



Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

TABLE OF CONTENTS

SAMPLE SUMMARY

SP1-SS-113023-SO-N L1683747-01 Solid

Collected by: JS | Collected date/time: 11/30/23 11:40 | Received date/time: 12/02/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Pesticides (GC) by Method 8081B	WG2183639	1	12/06/23 08:59	12/06/23 18:26	LTB	Mt. Juliet, TN

SP2-SS-113023-SO-N L1683747-02 Solid

Collected by: JS | Collected date/time: 11/30/23 11:30 | Received date/time: 12/02/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Pesticides (GC) by Method 8081B	WG2183639	1	12/06/23 08:59	12/06/23 18:36	LTB	Mt. Juliet, TN

SP3-SS-113023-SO-N L1683747-03 Solid

Collected by: JS | Collected date/time: 11/30/23 11:25 | Received date/time: 12/02/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Pesticides (GC) by Method 8081B	WG2183639	1	12/06/23 08:59	12/06/23 18:46	LTB	Mt. Juliet, TN

SP4-SS-113023-SO-N L1683747-04 Solid

Collected by: JS | Collected date/time: 11/30/23 12:00 | Received date/time: 12/02/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Pesticides (GC) by Method 8081B	WG2183640	1	12/06/23 09:02	12/06/23 22:59	DLH	Mt. Juliet, TN

SP5-SS-113023-SO-N L1683747-05 Solid

Collected by: JS | Collected date/time: 11/30/23 12:40 | Received date/time: 12/02/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Pesticides (GC) by Method 8081B	WG2183640	1	12/06/23 09:02	12/06/23 23:08	MFM	Mt. Juliet, TN

SP6-SS-113023-SO-N L1683747-06 Solid

Collected by: JS | Collected date/time: 11/30/23 12:45 | Received date/time: 12/02/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Pesticides (GC) by Method 8081B	WG2183640	1	12/06/23 09:02	12/06/23 23:17	MFM	Mt. Juliet, TN

SP7-SS-113023-SO-N L1683747-07 Solid

Collected by: JS | Collected date/time: 11/30/23 11:00 | Received date/time: 12/02/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Pesticides (GC) by Method 8081B	WG2183640	1	12/06/23 09:02	12/06/23 23:26	MFM	Mt. Juliet, TN

SP11-SS-113023-SO-N L1683747-08 Solid

Collected by: JS | Collected date/time: 11/30/23 12:10 | Received date/time: 12/02/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Pesticides (GC) by Method 8081B	WG2183640	1	12/06/23 09:02	12/06/23 23:35	MFM	Mt. Juliet, TN

SAMPLE SUMMARY

SP12-SS-113023-SO-N L1683747-09 Solid

Collected by: JS | Collected date/time: 11/30/23 12:05 | Received date/time: 12/02/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Pesticides (GC) by Method 8081B	WG2183640	1	12/06/23 09:02	12/06/23 23:44	MFM	Mt. Juliet, TN

SP13-SS-113023-SO-N L1683747-10 Solid

Collected by: JS | Collected date/time: 11/30/23 11:15 | Received date/time: 12/02/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Pesticides (GC) by Method 8081B	WG2183640	1	12/06/23 09:02	12/06/23 23:52	MFM	Mt. Juliet, TN

SP14-SS-113023-SO-N L1683747-11 Solid

Collected by: JS | Collected date/time: 11/30/23 12:35 | Received date/time: 12/02/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Pesticides (GC) by Method 8081B	WG2183640	1	12/06/23 09:02	12/07/23 00:01	MFM	Mt. Juliet, TN

SP15-SS-113023-SO-N L1683747-12 Solid

Collected by: JS | Collected date/time: 11/30/23 11:10 | Received date/time: 12/02/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Pesticides (GC) by Method 8081B	WG2183640	1	12/06/23 09:02	12/07/23 00:10	MFM	Mt. Juliet, TN

SP16-SS-113023-SO-N L1683747-13 Solid

Collected by: JS | Collected date/time: 11/30/23 10:45 | Received date/time: 12/02/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Pesticides (GC) by Method 8081B	WG2183640	1	12/06/23 09:02	12/07/23 00:19	MFM	Mt. Juliet, TN

SP17-SS-113023-SO-N L1683747-14 Solid

Collected by: JS | Collected date/time: 11/30/23 10:35 | Received date/time: 12/02/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Pesticides (GC) by Method 8081B	WG2183640	1	12/06/23 09:02	12/07/23 01:21	MFM	Mt. Juliet, TN

SP20-SS-113023-SO-N L1683747-15 Solid

Collected by: JS | Collected date/time: 11/30/23 10:05 | Received date/time: 12/02/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Pesticides (GC) by Method 8081B	WG2183640	1	12/06/23 09:02	12/07/23 00:28	MFM	Mt. Juliet, TN

SP21-SS-113023-SO-N L1683747-16 Solid

Collected by: JS | Collected date/time: 11/30/23 10:10 | Received date/time: 12/02/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Pesticides (GC) by Method 8081B	WG2183640	10	12/06/23 09:02	12/07/23 22:47	MFM	Mt. Juliet, TN

SAMPLE SUMMARY

SP22-SS-113023-SO-N L1683747-17 Solid

Collected by: JS
Collected date/time: 11/30/23 13:05
Received date/time: 12/02/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Pesticides (GC) by Method 8081B	WG2183640	1	12/06/23 09:02	12/07/23 00:46	MFM	Mt. Juliet, TN

SP23-SS-113023-SO-N L1683747-18 Solid

Collected by: JS
Collected date/time: 11/30/23 13:10
Received date/time: 12/02/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Pesticides (GC) by Method 8081B	WG2183640	1	12/06/23 09:02	12/07/23 00:55	MFM	Mt. Juliet, TN

SP24-SS-113023-SO-N L1683747-19 Solid

Collected by: JS
Collected date/time: 11/30/23 10:25
Received date/time: 12/02/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Pesticides (GC) by Method 8081B	WG2183640	1	12/06/23 09:02	12/07/23 01:03	MFM	Mt. Juliet, TN

SP19-SS-113023-SO-N L1683747-20 Solid

Collected by: JS
Collected date/time: 11/30/23 10:00
Received date/time: 12/02/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Pesticides (GC) by Method 8081B	WG2183640	1	12/06/23 09:02	12/07/23 01:12	MFM	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Daphne Richards
Project Manager

Pesticides (GC) by Method 8081B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Aldrin	ND		0.0200	1	12/06/2023 18:26	WG2183639
Alpha BHC	ND		0.0200	1	12/06/2023 18:26	WG2183639
Beta BHC	ND		0.0200	1	12/06/2023 18:26	WG2183639
Delta BHC	ND		0.0200	1	12/06/2023 18:26	WG2183639
Gamma BHC	ND		0.0200	1	12/06/2023 18:26	WG2183639
Chlordane	ND		0.300	1	12/06/2023 18:26	WG2183639
4,4-DDD	ND		0.0200	1	12/06/2023 18:26	WG2183639
4,4-DDE	ND		0.0200	1	12/06/2023 18:26	WG2183639
4,4-DDT	ND		0.0200	1	12/06/2023 18:26	WG2183639
Dieldrin	ND		0.0200	1	12/06/2023 18:26	WG2183639
Endosulfan I	ND		0.0200	1	12/06/2023 18:26	WG2183639
Endosulfan II	ND		0.0200	1	12/06/2023 18:26	WG2183639
Endosulfan sulfate	ND		0.0200	1	12/06/2023 18:26	WG2183639
Endrin	ND		0.0200	1	12/06/2023 18:26	WG2183639
Endrin aldehyde	ND		0.0200	1	12/06/2023 18:26	WG2183639
Endrin ketone	ND		0.0200	1	12/06/2023 18:26	WG2183639
Hexachlorobenzene	ND		0.0200	1	12/06/2023 18:26	WG2183639
Heptachlor	ND		0.0200	1	12/06/2023 18:26	WG2183639
Heptachlor epoxide	ND		0.0200	1	12/06/2023 18:26	WG2183639
Methoxychlor	ND		0.0200	1	12/06/2023 18:26	WG2183639
Toxaphene	ND		0.400	1	12/06/2023 18:26	WG2183639
(S) Decachlorobiphenyl	*77.6*		*10.0-135*		*12/06/2023 18:26*	WG2183639
(S) Tetrachloro-m-xylene	*77.6*		*10.0-139*		*12/06/2023 18:26*	WG2183639

Pesticides (GC) by Method 8081B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Aldrin	ND		0.0200	1	12/06/2023 18:36	WG2183639
Alpha BHC	ND		0.0200	1	12/06/2023 18:36	WG2183639
Beta BHC	ND		0.0200	1	12/06/2023 18:36	WG2183639
Delta BHC	ND		0.0200	1	12/06/2023 18:36	WG2183639
Gamma BHC	ND		0.0200	1	12/06/2023 18:36	WG2183639
Chlordane	ND		0.300	1	12/06/2023 18:36	WG2183639
4,4-DDD	ND		0.0200	1	12/06/2023 18:36	WG2183639
4,4-DDE	ND		0.0200	1	12/06/2023 18:36	WG2183639
4,4-DDT	ND		0.0200	1	12/06/2023 18:36	WG2183639
Dieldrin	ND		0.0200	1	12/06/2023 18:36	WG2183639
Endosulfan I	ND		0.0200	1	12/06/2023 18:36	WG2183639
Endosulfan II	ND		0.0200	1	12/06/2023 18:36	WG2183639
Endosulfan sulfate	ND		0.0200	1	12/06/2023 18:36	WG2183639
Endrin	ND		0.0200	1	12/06/2023 18:36	WG2183639
Endrin aldehyde	ND		0.0200	1	12/06/2023 18:36	WG2183639
Endrin ketone	ND		0.0200	1	12/06/2023 18:36	WG2183639
Hexachlorobenzene	ND		0.0200	1	12/06/2023 18:36	WG2183639
Heptachlor	ND		0.0200	1	12/06/2023 18:36	WG2183639
Heptachlor epoxide	ND		0.0200	1	12/06/2023 18:36	WG2183639
Methoxychlor	ND		0.0200	1	12/06/2023 18:36	WG2183639
Toxaphene	ND		0.400	1	12/06/2023 18:36	WG2183639
(S) Decachlorobiphenyl	*62.0*		*10.0-135*		*12/06/2023 18:36*	WG2183639
(S) Tetrachloro-m-xylene	*63.6*		*10.0-139*		*12/06/2023 18:36*	WG2183639

Pesticides (GC) by Method 8081B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Aldrin	ND		0.0200	1	12/06/2023 18:46	WG2183639
Alpha BHC	ND		0.0200	1	12/06/2023 18:46	WG2183639
Beta BHC	ND		0.0200	1	12/06/2023 18:46	WG2183639
Delta BHC	ND		0.0200	1	12/06/2023 18:46	WG2183639
Gamma BHC	ND		0.0200	1	12/06/2023 18:46	WG2183639
Chlordane	ND		0.300	1	12/06/2023 18:46	WG2183639
4,4-DDD	ND		0.0200	1	12/06/2023 18:46	WG2183639
4,4-DDE	ND		0.0200	1	12/06/2023 18:46	WG2183639
4,4-DDT	ND		0.0200	1	12/06/2023 18:46	WG2183639
Dieldrin	ND		0.0200	1	12/06/2023 18:46	WG2183639
Endosulfan I	ND		0.0200	1	12/06/2023 18:46	WG2183639
Endosulfan II	ND		0.0200	1	12/06/2023 18:46	WG2183639
Endosulfan sulfate	ND		0.0200	1	12/06/2023 18:46	WG2183639
Endrin	ND		0.0200	1	12/06/2023 18:46	WG2183639
Endrin aldehyde	ND		0.0200	1	12/06/2023 18:46	WG2183639
Endrin ketone	ND		0.0200	1	12/06/2023 18:46	WG2183639
Hexachlorobenzene	ND		0.0200	1	12/06/2023 18:46	WG2183639
Heptachlor	ND		0.0200	1	12/06/2023 18:46	WG2183639
Heptachlor epoxide	ND		0.0200	1	12/06/2023 18:46	WG2183639
Methoxychlor	ND		0.0200	1	12/06/2023 18:46	WG2183639
Toxaphene	ND		0.400	1	12/06/2023 18:46	WG2183639
(S) Decachlorobiphenyl	*72.1*		*10.0-135*		*12/06/2023 18:46*	WG2183639
(S) Tetrachloro-m-xylene	*72.2*		*10.0-139*		*12/06/2023 18:46*	WG2183639

Pesticides (GC) by Method 8081B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Aldrin	ND		0.0200	1	12/06/2023 22:59	WG2183640
Alpha BHC	ND		0.0200	1	12/06/2023 22:59	WG2183640
Beta BHC	ND		0.0200	1	12/06/2023 22:59	WG2183640
Delta BHC	ND		0.0200	1	12/06/2023 22:59	WG2183640
Gamma BHC	ND		0.0200	1	12/06/2023 22:59	WG2183640
Chlordane	ND		0.300	1	12/06/2023 22:59	WG2183640
4,4-DDD	ND		0.0200	1	12/06/2023 22:59	WG2183640
4,4-DDE	0.0281		0.0200	1	12/06/2023 22:59	WG2183640
4,4-DDT	ND		0.0200	1	12/06/2023 22:59	WG2183640
Dieldrin	ND		0.0200	1	12/06/2023 22:59	WG2183640
Endosulfan I	ND		0.0200	1	12/06/2023 22:59	WG2183640
Endosulfan II	ND		0.0200	1	12/06/2023 22:59	WG2183640
Endosulfan sulfate	ND		0.0200	1	12/06/2023 22:59	WG2183640
Endrin	ND		0.0200	1	12/06/2023 22:59	WG2183640
Endrin aldehyde	ND		0.0200	1	12/06/2023 22:59	WG2183640
Endrin ketone	ND		0.0200	1	12/06/2023 22:59	WG2183640
Hexachlorobenzene	ND		0.0200	1	12/06/2023 22:59	WG2183640
Heptachlor	ND		0.0200	1	12/06/2023 22:59	WG2183640
Heptachlor epoxide	ND		0.0200	1	12/06/2023 22:59	WG2183640
Methoxychlor	ND		0.0200	1	12/06/2023 22:59	WG2183640
Toxaphene	1.07		0.400	1	12/06/2023 22:59	WG2183640
(S) Decachlorobiphenyl	*93.7*		*10.0-135*		*12/06/2023 22:59*	WG2183640
(S) Tetrachloro-m-xylene	*78.5*		*10.0-139*		*12/06/2023 22:59*	WG2183640

Pesticides (GC) by Method 8081B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Aldrin	ND		0.0200	1	12/06/2023 23:08	WG2183640
Alpha BHC	ND		0.0200	1	12/06/2023 23:08	WG2183640
Beta BHC	ND		0.0200	1	12/06/2023 23:08	WG2183640
Delta BHC	ND		0.0200	1	12/06/2023 23:08	WG2183640
Gamma BHC	ND		0.0200	1	12/06/2023 23:08	WG2183640
Chlordane	ND		0.300	1	12/06/2023 23:08	WG2183640
4,4-DDD	ND		0.0200	1	12/06/2023 23:08	WG2183640
4,4-DDE	0.0302		0.0200	1	12/06/2023 23:08	WG2183640
4,4-DDT	ND		0.0200	1	12/06/2023 23:08	WG2183640
Dieldrin	ND		0.0200	1	12/06/2023 23:08	WG2183640
Endosulfan I	ND		0.0200	1	12/06/2023 23:08	WG2183640
Endosulfan II	ND		0.0200	1	12/06/2023 23:08	WG2183640
Endosulfan sulfate	ND		0.0200	1	12/06/2023 23:08	WG2183640
Endrin	ND		0.0200	1	12/06/2023 23:08	WG2183640
Endrin aldehyde	ND		0.0200	1	12/06/2023 23:08	WG2183640
Endrin ketone	ND		0.0200	1	12/06/2023 23:08	WG2183640
Hexachlorobenzene	ND		0.0200	1	12/06/2023 23:08	WG2183640
Heptachlor	ND		0.0200	1	12/06/2023 23:08	WG2183640
Heptachlor epoxide	ND		0.0200	1	12/06/2023 23:08	WG2183640
Methoxychlor	ND		0.0200	1	12/06/2023 23:08	WG2183640
Toxaphene	ND		0.400	1	12/06/2023 23:08	WG2183640
(S) Decachlorobiphenyl	*61.7*		*10.0-135*		*12/06/2023 23:08*	WG2183640
(S) Tetrachloro-m-xylene	*70.7*		*10.0-139*		*12/06/2023 23:08*	WG2183640

Pesticides (GC) by Method 8081B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Aldrin	ND		0.0200	1	12/06/2023 23:17	WG2183640
Alpha BHC	ND		0.0200	1	12/06/2023 23:17	WG2183640
Beta BHC	ND		0.0200	1	12/06/2023 23:17	WG2183640
Delta BHC	ND		0.0200	1	12/06/2023 23:17	WG2183640
Gamma BHC	ND		0.0200	1	12/06/2023 23:17	WG2183640
Chlordane	ND		0.300	1	12/06/2023 23:17	WG2183640
4,4-DDD	ND		0.0200	1	12/06/2023 23:17	WG2183640
4,4-DDE	0.0617		0.0200	1	12/06/2023 23:17	WG2183640
4,4-DDT	ND		0.0200	1	12/06/2023 23:17	WG2183640
Dieldrin	ND		0.0200	1	12/06/2023 23:17	WG2183640
Endosulfan I	ND		0.0200	1	12/06/2023 23:17	WG2183640
Endosulfan II	ND		0.0200	1	12/06/2023 23:17	WG2183640
Endosulfan sulfate	ND		0.0200	1	12/06/2023 23:17	WG2183640
Endrin	ND		0.0200	1	12/06/2023 23:17	WG2183640
Endrin aldehyde	ND		0.0200	1	12/06/2023 23:17	WG2183640
Endrin ketone	ND		0.0200	1	12/06/2023 23:17	WG2183640
Hexachlorobenzene	ND		0.0200	1	12/06/2023 23:17	WG2183640
Heptachlor	ND		0.0200	1	12/06/2023 23:17	WG2183640
Heptachlor epoxide	ND		0.0200	1	12/06/2023 23:17	WG2183640
Methoxychlor	ND		0.0200	1	12/06/2023 23:17	WG2183640
Toxaphene	ND		0.400	1	12/06/2023 23:17	WG2183640
(S) Decachlorobiphenyl	*69.7*		*10.0-135*		*12/06/2023 23:17*	WG2183640
(S) Tetrachloro-m-xylene	*77.1*		*10.0-139*		*12/06/2023 23:17*	WG2183640

Pesticides (GC) by Method 8081B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Aldrin	ND		0.0200	1	12/06/2023 23:26	WG2183640
Alpha BHC	ND		0.0200	1	12/06/2023 23:26	WG2183640
Beta BHC	ND		0.0200	1	12/06/2023 23:26	WG2183640
Delta BHC	ND		0.0200	1	12/06/2023 23:26	WG2183640
Gamma BHC	ND		0.0200	1	12/06/2023 23:26	WG2183640
Chlordane	ND		0.300	1	12/06/2023 23:26	WG2183640
4,4-DDD	ND		0.0200	1	12/06/2023 23:26	WG2183640
4,4-DDE	0.0445		0.0200	1	12/06/2023 23:26	WG2183640
4,4-DDT	ND		0.0200	1	12/06/2023 23:26	WG2183640
Dieldrin	ND		0.0200	1	12/06/2023 23:26	WG2183640
Endosulfan I	ND		0.0200	1	12/06/2023 23:26	WG2183640
Endosulfan II	ND		0.0200	1	12/06/2023 23:26	WG2183640
Endosulfan sulfate	ND		0.0200	1	12/06/2023 23:26	WG2183640
Endrin	ND		0.0200	1	12/06/2023 23:26	WG2183640
Endrin aldehyde	ND		0.0200	1	12/06/2023 23:26	WG2183640
Endrin ketone	ND		0.0200	1	12/06/2023 23:26	WG2183640
Hexachlorobenzene	ND		0.0200	1	12/06/2023 23:26	WG2183640
Heptachlor	ND		0.0200	1	12/06/2023 23:26	WG2183640
Heptachlor epoxide	ND		0.0200	1	12/06/2023 23:26	WG2183640
Methoxychlor	ND		0.0200	1	12/06/2023 23:26	WG2183640
Toxaphene	ND		0.400	1	12/06/2023 23:26	WG2183640
(S) Decachlorobiphenyl	*74.1*		*10.0-135*		*12/06/2023 23:26*	WG2183640
(S) Tetrachloro-m-xylene	*76.0*		*10.0-139*		*12/06/2023 23:26*	WG2183640

Pesticides (GC) by Method 8081B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Aldrin	ND		0.0200	1	12/06/2023 23:35	WG2183640
Alpha BHC	ND		0.0200	1	12/06/2023 23:35	WG2183640
Beta BHC	ND		0.0200	1	12/06/2023 23:35	WG2183640
Delta BHC	ND		0.0200	1	12/06/2023 23:35	WG2183640
Gamma BHC	ND		0.0200	1	12/06/2023 23:35	WG2183640
Chlordane	ND		0.300	1	12/06/2023 23:35	WG2183640
4,4-DDD	ND		0.0200	1	12/06/2023 23:35	WG2183640
4,4-DDE	ND		0.0200	1	12/06/2023 23:35	WG2183640
4,4-DDT	ND		0.0200	1	12/06/2023 23:35	WG2183640
Dieldrin	ND		0.0200	1	12/06/2023 23:35	WG2183640
Endosulfan I	ND		0.0200	1	12/06/2023 23:35	WG2183640
Endosulfan II	ND		0.0200	1	12/06/2023 23:35	WG2183640
Endosulfan sulfate	ND		0.0200	1	12/06/2023 23:35	WG2183640
Endrin	ND		0.0200	1	12/06/2023 23:35	WG2183640
Endrin aldehyde	ND		0.0200	1	12/06/2023 23:35	WG2183640
Endrin ketone	ND		0.0200	1	12/06/2023 23:35	WG2183640
Hexachlorobenzene	ND		0.0200	1	12/06/2023 23:35	WG2183640
Heptachlor	ND		0.0200	1	12/06/2023 23:35	WG2183640
Heptachlor epoxide	ND		0.0200	1	12/06/2023 23:35	WG2183640
Methoxychlor	ND		0.0200	1	12/06/2023 23:35	WG2183640
Toxaphene	ND		0.400	1	12/06/2023 23:35	WG2183640
(S) Decachlorobiphenyl	*65.8*		*10.0-135*		*12/06/2023 23:35*	WG2183640
(S) Tetrachloro-m-xylene	*68.9*		*10.0-139*		*12/06/2023 23:35*	WG2183640

Pesticides (GC) by Method 8081B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Aldrin	ND		0.0200	1	12/06/2023 23:44	WG2183640
Alpha BHC	ND		0.0200	1	12/06/2023 23:44	WG2183640
Beta BHC	ND		0.0200	1	12/06/2023 23:44	WG2183640
Delta BHC	ND		0.0200	1	12/06/2023 23:44	WG2183640
Gamma BHC	ND		0.0200	1	12/06/2023 23:44	WG2183640
Chlordane	ND		0.300	1	12/06/2023 23:44	WG2183640
4,4-DDD	ND		0.0200	1	12/06/2023 23:44	WG2183640
4,4-DDE	ND		0.0200	1	12/06/2023 23:44	WG2183640
4,4-DDT	ND		0.0200	1	12/06/2023 23:44	WG2183640
Dieldrin	ND		0.0200	1	12/06/2023 23:44	WG2183640
Endosulfan I	ND		0.0200	1	12/06/2023 23:44	WG2183640
Endosulfan II	ND		0.0200	1	12/06/2023 23:44	WG2183640
Endosulfan sulfate	ND		0.0200	1	12/06/2023 23:44	WG2183640
Endrin	ND		0.0200	1	12/06/2023 23:44	WG2183640
Endrin aldehyde	ND		0.0200	1	12/06/2023 23:44	WG2183640
Endrin ketone	ND		0.0200	1	12/06/2023 23:44	WG2183640
Hexachlorobenzene	ND		0.0200	1	12/06/2023 23:44	WG2183640
Heptachlor	ND		0.0200	1	12/06/2023 23:44	WG2183640
Heptachlor epoxide	ND		0.0200	1	12/06/2023 23:44	WG2183640
Methoxychlor	ND		0.0200	1	12/06/2023 23:44	WG2183640
Toxaphene	ND		0.400	1	12/06/2023 23:44	WG2183640
(S) Decachlorobiphenyl	*71.9*		*10.0-135*		*12/06/2023 23:44*	WG2183640
(S) Tetrachloro-m-xylene	*75.9*		*10.0-139*		*12/06/2023 23:44*	WG2183640

Pesticides (GC) by Method 8081B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Aldrin	ND		0.0200	1	12/06/2023 23:52	WG2183640
Alpha BHC	ND		0.0200	1	12/06/2023 23:52	WG2183640
Beta BHC	ND		0.0200	1	12/06/2023 23:52	WG2183640
Delta BHC	ND		0.0200	1	12/06/2023 23:52	WG2183640
Gamma BHC	ND		0.0200	1	12/06/2023 23:52	WG2183640
Chlordane	ND		0.300	1	12/06/2023 23:52	WG2183640
4,4-DDD	ND		0.0200	1	12/06/2023 23:52	WG2183640
4,4-DDE	ND		0.0200	1	12/06/2023 23:52	WG2183640
4,4-DDT	ND		0.0200	1	12/06/2023 23:52	WG2183640
Dieldrin	ND		0.0200	1	12/06/2023 23:52	WG2183640
Endosulfan I	ND		0.0200	1	12/06/2023 23:52	WG2183640
Endosulfan II	ND		0.0200	1	12/06/2023 23:52	WG2183640
Endosulfan sulfate	ND		0.0200	1	12/06/2023 23:52	WG2183640
Endrin	ND		0.0200	1	12/06/2023 23:52	WG2183640
Endrin aldehyde	ND		0.0200	1	12/06/2023 23:52	WG2183640
Endrin ketone	ND		0.0200	1	12/06/2023 23:52	WG2183640
Hexachlorobenzene	ND		0.0200	1	12/06/2023 23:52	WG2183640
Heptachlor	ND		0.0200	1	12/06/2023 23:52	WG2183640
Heptachlor epoxide	ND		0.0200	1	12/06/2023 23:52	WG2183640
Methoxychlor	ND		0.0200	1	12/06/2023 23:52	WG2183640
Toxaphene	ND		0.400	1	12/06/2023 23:52	WG2183640
(S) Decachlorobiphenyl	*64.7*		*10.0-135*		*12/06/2023 23:52*	WG2183640
(S) Tetrachloro-m-xylene	*69.7*		*10.0-139*		*12/06/2023 23:52*	WG2183640

Pesticides (GC) by Method 8081B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Aldrin	ND		0.0200	1	12/07/2023 00:01	WG2183640
Alpha BHC	ND		0.0200	1	12/07/2023 00:01	WG2183640
Beta BHC	ND		0.0200	1	12/07/2023 00:01	WG2183640
Delta BHC	ND		0.0200	1	12/07/2023 00:01	WG2183640
Gamma BHC	ND		0.0200	1	12/07/2023 00:01	WG2183640
Chlordane	ND		0.300	1	12/07/2023 00:01	WG2183640
4,4-DDD	ND		0.0200	1	12/07/2023 00:01	WG2183640
4,4-DDE	0.0345		0.0200	1	12/07/2023 00:01	WG2183640
4,4-DDT	ND		0.0200	1	12/07/2023 00:01	WG2183640
Dieldrin	ND		0.0200	1	12/07/2023 00:01	WG2183640
Endosulfan I	ND		0.0200	1	12/07/2023 00:01	WG2183640
Endosulfan II	ND		0.0200	1	12/07/2023 00:01	WG2183640
Endosulfan sulfate	ND		0.0200	1	12/07/2023 00:01	WG2183640
Endrin	ND		0.0200	1	12/07/2023 00:01	WG2183640
Endrin aldehyde	ND		0.0200	1	12/07/2023 00:01	WG2183640
Endrin ketone	ND		0.0200	1	12/07/2023 00:01	WG2183640
Hexachlorobenzene	ND		0.0200	1	12/07/2023 00:01	WG2183640
Heptachlor	ND		0.0200	1	12/07/2023 00:01	WG2183640
Heptachlor epoxide	ND		0.0200	1	12/07/2023 00:01	WG2183640
Methoxychlor	ND		0.0200	1	12/07/2023 00:01	WG2183640
Toxaphene	ND		0.400	1	12/07/2023 00:01	WG2183640
(S) Decachlorobiphenyl	*73.3*		*10.0-135*		*12/07/2023 00:01*	WG2183640
(S) Tetrachloro-m-xylene	*80.2*		*10.0-139*		*12/07/2023 00:01*	WG2183640

Pesticides (GC) by Method 8081B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Aldrin	ND		0.0200	1	12/07/2023 00:10	WG2183640
Alpha BHC	ND		0.0200	1	12/07/2023 00:10	WG2183640
Beta BHC	ND		0.0200	1	12/07/2023 00:10	WG2183640
Delta BHC	ND		0.0200	1	12/07/2023 00:10	WG2183640
Gamma BHC	ND		0.0200	1	12/07/2023 00:10	WG2183640
Chlordane	ND		0.300	1	12/07/2023 00:10	WG2183640
4,4-DDD	ND		0.0200	1	12/07/2023 00:10	WG2183640
4,4-DDE	ND		0.0200	1	12/07/2023 00:10	WG2183640
4,4-DDT	ND		0.0200	1	12/07/2023 00:10	WG2183640
Dieldrin	ND		0.0200	1	12/07/2023 00:10	WG2183640
Endosulfan I	ND		0.0200	1	12/07/2023 00:10	WG2183640
Endosulfan II	ND		0.0200	1	12/07/2023 00:10	WG2183640
Endosulfan sulfate	ND		0.0200	1	12/07/2023 00:10	WG2183640
Endrin	ND		0.0200	1	12/07/2023 00:10	WG2183640
Endrin aldehyde	ND		0.0200	1	12/07/2023 00:10	WG2183640
Endrin ketone	ND		0.0200	1	12/07/2023 00:10	WG2183640
Hexachlorobenzene	ND		0.0200	1	12/07/2023 00:10	WG2183640
Heptachlor	ND		0.0200	1	12/07/2023 00:10	WG2183640
Heptachlor epoxide	ND		0.0200	1	12/07/2023 00:10	WG2183640
Methoxychlor	ND		0.0200	1	12/07/2023 00:10	WG2183640
Toxaphene	ND		0.400	1	12/07/2023 00:10	WG2183640
(S) Decachlorobiphenyl	*74.5*		*10.0-135*		*12/07/2023 00:10*	WG2183640
(S) Tetrachloro-m-xylene	*77.5*		*10.0-139*		*12/07/2023 00:10*	WG2183640

Pesticides (GC) by Method 8081B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Aldrin	ND		0.0200	1	12/07/2023 00:19	WG2183640
Alpha BHC	ND		0.0200	1	12/07/2023 00:19	WG2183640
Beta BHC	ND		0.0200	1	12/07/2023 00:19	WG2183640
Delta BHC	ND		0.0200	1	12/07/2023 00:19	WG2183640
Gamma BHC	ND		0.0200	1	12/07/2023 00:19	WG2183640
Chlordane	ND		0.300	1	12/07/2023 00:19	WG2183640
4,4-DDD	ND		0.0200	1	12/07/2023 00:19	WG2183640
4,4-DDE	0.0237		0.0200	1	12/07/2023 00:19	WG2183640
4,4-DDT	ND		0.0200	1	12/07/2023 00:19	WG2183640
Dieldrin	ND		0.0200	1	12/07/2023 00:19	WG2183640
Endosulfan I	ND		0.0200	1	12/07/2023 00:19	WG2183640
Endosulfan II	ND		0.0200	1	12/07/2023 00:19	WG2183640
Endosulfan sulfate	ND		0.0200	1	12/07/2023 00:19	WG2183640
Endrin	ND		0.0200	1	12/07/2023 00:19	WG2183640
Endrin aldehyde	ND		0.0200	1	12/07/2023 00:19	WG2183640
Endrin ketone	ND		0.0200	1	12/07/2023 00:19	WG2183640
Hexachlorobenzene	ND		0.0200	1	12/07/2023 00:19	WG2183640
Heptachlor	ND		0.0200	1	12/07/2023 00:19	WG2183640
Heptachlor epoxide	ND		0.0200	1	12/07/2023 00:19	WG2183640
Methoxychlor	ND		0.0200	1	12/07/2023 00:19	WG2183640
Toxaphene	ND		0.400	1	12/07/2023 00:19	WG2183640
(S) Decachlorobiphenyl	*73.5*		*10.0-135*		*12/07/2023 00:19*	WG2183640
(S) Tetrachloro-m-xylene	*73.8*		*10.0-139*		*12/07/2023 00:19*	WG2183640

Pesticides (GC) by Method 8081B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Aldrin	ND		0.0200	1	12/07/2023 01:21	WG2183640
Alpha BHC	ND		0.0200	1	12/07/2023 01:21	WG2183640
Beta BHC	ND		0.0200	1	12/07/2023 01:21	WG2183640
Delta BHC	ND		0.0200	1	12/07/2023 01:21	WG2183640
Gamma BHC	ND		0.0200	1	12/07/2023 01:21	WG2183640
Chlordane	ND		0.300	1	12/07/2023 01:21	WG2183640
4,4-DDD	ND		0.0200	1	12/07/2023 01:21	WG2183640
4,4-DDE	ND		0.0200	1	12/07/2023 01:21	WG2183640
4,4-DDT	ND		0.0200	1	12/07/2023 01:21	WG2183640
Dieldrin	ND		0.0200	1	12/07/2023 01:21	WG2183640
Endosulfan I	ND		0.0200	1	12/07/2023 01:21	WG2183640
Endosulfan II	ND		0.0200	1	12/07/2023 01:21	WG2183640
Endosulfan sulfate	ND		0.0200	1	12/07/2023 01:21	WG2183640
Endrin	ND		0.0200	1	12/07/2023 01:21	WG2183640
Endrin aldehyde	ND		0.0200	1	12/07/2023 01:21	WG2183640
Endrin ketone	ND		0.0200	1	12/07/2023 01:21	WG2183640
Hexachlorobenzene	ND		0.0200	1	12/07/2023 01:21	WG2183640
Heptachlor	ND		0.0200	1	12/07/2023 01:21	WG2183640
Heptachlor epoxide	ND		0.0200	1	12/07/2023 01:21	WG2183640
Methoxychlor	ND		0.0200	1	12/07/2023 01:21	WG2183640
Toxaphene	ND		0.400	1	12/07/2023 01:21	WG2183640
(S) Decachlorobiphenyl	*70.6*		*10.0-135*		*12/07/2023 01:21*	WG2183640
(S) Tetrachloro-m-xylene	*72.4*		*10.0-139*		*12/07/2023 01:21*	WG2183640

Pesticides (GC) by Method 8081B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Aldrin	ND		0.0200	1	12/07/2023 00:28	WG2183640
Alpha BHC	ND		0.0200	1	12/07/2023 00:28	WG2183640
Beta BHC	ND		0.0200	1	12/07/2023 00:28	WG2183640
Delta BHC	ND		0.0200	1	12/07/2023 00:28	WG2183640
Gamma BHC	ND		0.0200	1	12/07/2023 00:28	WG2183640
Chlordane	ND		0.300	1	12/07/2023 00:28	WG2183640
4,4-DDD	ND		0.0200	1	12/07/2023 00:28	WG2183640
4,4-DDE	ND		0.0200	1	12/07/2023 00:28	WG2183640
4,4-DDT	ND		0.0200	1	12/07/2023 00:28	WG2183640
Dieldrin	ND		0.0200	1	12/07/2023 00:28	WG2183640
Endosulfan I	ND		0.0200	1	12/07/2023 00:28	WG2183640
Endosulfan II	ND		0.0200	1	12/07/2023 00:28	WG2183640
Endosulfan sulfate	ND		0.0200	1	12/07/2023 00:28	WG2183640
Endrin	ND		0.0200	1	12/07/2023 00:28	WG2183640
Endrin aldehyde	ND		0.0200	1	12/07/2023 00:28	WG2183640
Endrin ketone	ND		0.0200	1	12/07/2023 00:28	WG2183640
Hexachlorobenzene	ND		0.0200	1	12/07/2023 00:28	WG2183640
Heptachlor	ND		0.0200	1	12/07/2023 00:28	WG2183640
Heptachlor epoxide	ND		0.0200	1	12/07/2023 00:28	WG2183640
Methoxychlor	ND		0.0200	1	12/07/2023 00:28	WG2183640
Toxaphene	ND		0.400	1	12/07/2023 00:28	WG2183640
(S) Decachlorobiphenyl	*65.7*		*10.0-135*		*12/07/2023 00:28*	WG2183640
(S) Tetrachloro-m-xylene	*67.4*		*10.0-139*		*12/07/2023 00:28*	WG2183640

Pesticides (GC) by Method 8081B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Aldrin	ND		0.200	10	12/07/2023 22:47	WG2183640
Alpha BHC	ND		0.200	10	12/07/2023 22:47	WG2183640
Beta BHC	ND		0.200	10	12/07/2023 22:47	WG2183640
Delta BHC	ND		0.200	10	12/07/2023 22:47	WG2183640
Gamma BHC	ND		0.200	10	12/07/2023 22:47	WG2183640
Chlordane	ND		3.00	10	12/07/2023 22:47	WG2183640
4,4-DDD	ND		0.200	10	12/07/2023 22:47	WG2183640
4,4-DDE	0.669		0.200	10	12/07/2023 22:47	WG2183640
4,4-DDT	ND		0.200	10	12/07/2023 22:47	WG2183640
Dieldrin	ND		0.200	10	12/07/2023 22:47	WG2183640
Endosulfan I	ND		0.200	10	12/07/2023 22:47	WG2183640
Endosulfan II	ND		0.200	10	12/07/2023 22:47	WG2183640
Endosulfan sulfate	ND		0.200	10	12/07/2023 22:47	WG2183640
Endrin	ND		0.200	10	12/07/2023 22:47	WG2183640
Endrin aldehyde	ND		0.200	10	12/07/2023 22:47	WG2183640
Endrin ketone	ND		0.200	10	12/07/2023 22:47	WG2183640
Hexachlorobenzene	ND		0.200	10	12/07/2023 22:47	WG2183640
Heptachlor	ND		0.200	10	12/07/2023 22:47	WG2183640
Heptachlor epoxide	ND		0.200	10	12/07/2023 22:47	WG2183640
Methoxychlor	ND		0.200	10	12/07/2023 22:47	WG2183640
Toxaphene	12.7		4.00	10	12/07/2023 22:47	WG2183640
(S) Decachlorobiphenyl	*83.6*		*10.0-135*		*12/07/2023 22:47*	WG2183640
(S) Tetrachloro-m-xylene	*70.9*		*10.0-139*		*12/07/2023 22:47*	WG2183640

Sample Narrative:

L1683747-16 WG2183640: Dilution due to matrix.

Pesticides (GC) by Method 8081B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Aldrin	ND		0.0200	1	12/07/2023 00:46	WG2183640
Alpha BHC	ND		0.0200	1	12/07/2023 00:46	WG2183640
Beta BHC	ND		0.0200	1	12/07/2023 00:46	WG2183640
Delta BHC	ND		0.0200	1	12/07/2023 00:46	WG2183640
Gamma BHC	ND		0.0200	1	12/07/2023 00:46	WG2183640
Chlordane	ND		0.300	1	12/07/2023 00:46	WG2183640
4,4-DDD	ND		0.0200	1	12/07/2023 00:46	WG2183640
4,4-DDE	0.0231		0.0200	1	12/07/2023 00:46	WG2183640
4,4-DDT	ND		0.0200	1	12/07/2023 00:46	WG2183640
Dieldrin	ND		0.0200	1	12/07/2023 00:46	WG2183640
Endosulfan I	ND		0.0200	1	12/07/2023 00:46	WG2183640
Endosulfan II	ND		0.0200	1	12/07/2023 00:46	WG2183640
Endosulfan sulfate	ND		0.0200	1	12/07/2023 00:46	WG2183640
Endrin	ND		0.0200	1	12/07/2023 00:46	WG2183640
Endrin aldehyde	ND		0.0200	1	12/07/2023 00:46	WG2183640
Endrin ketone	ND		0.0200	1	12/07/2023 00:46	WG2183640
Hexachlorobenzene	ND		0.0200	1	12/07/2023 00:46	WG2183640
Heptachlor	ND		0.0200	1	12/07/2023 00:46	WG2183640
Heptachlor epoxide	ND		0.0200	1	12/07/2023 00:46	WG2183640
Methoxychlor	ND		0.0200	1	12/07/2023 00:46	WG2183640
Toxaphene	ND		0.400	1	12/07/2023 00:46	WG2183640
(S) Decachlorobiphenyl	*79.0*		*10.0-135*		*12/07/2023 00:46*	WG2183640
(S) Tetrachloro-m-xylene	*82.4*		*10.0-139*		*12/07/2023 00:46*	WG2183640

Pesticides (GC) by Method 8081B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Aldrin	ND		0.0200	1	12/07/2023 00:55	WG2183640
Alpha BHC	ND		0.0200	1	12/07/2023 00:55	WG2183640
Beta BHC	ND		0.0200	1	12/07/2023 00:55	WG2183640
Delta BHC	ND		0.0200	1	12/07/2023 00:55	WG2183640
Gamma BHC	ND		0.0200	1	12/07/2023 00:55	WG2183640
Chlordane	ND		0.300	1	12/07/2023 00:55	WG2183640
4,4-DDD	ND		0.0200	1	12/07/2023 00:55	WG2183640
4,4-DDE	ND		0.0200	1	12/07/2023 00:55	WG2183640
4,4-DDT	ND		0.0200	1	12/07/2023 00:55	WG2183640
Dieldrin	ND		0.0200	1	12/07/2023 00:55	WG2183640
Endosulfan I	ND		0.0200	1	12/07/2023 00:55	WG2183640
Endosulfan II	ND		0.0200	1	12/07/2023 00:55	WG2183640
Endosulfan sulfate	ND		0.0200	1	12/07/2023 00:55	WG2183640
Endrin	ND		0.0200	1	12/07/2023 00:55	WG2183640
Endrin aldehyde	ND		0.0200	1	12/07/2023 00:55	WG2183640
Endrin ketone	ND		0.0200	1	12/07/2023 00:55	WG2183640
Hexachlorobenzene	ND		0.0200	1	12/07/2023 00:55	WG2183640
Heptachlor	ND		0.0200	1	12/07/2023 00:55	WG2183640
Heptachlor epoxide	ND		0.0200	1	12/07/2023 00:55	WG2183640
Methoxychlor	ND		0.0200	1	12/07/2023 00:55	WG2183640
Toxaphene	ND		0.400	1	12/07/2023 00:55	WG2183640
(S) Decachlorobiphenyl	*75.7*		*10.0-135*		*12/07/2023 00:55*	WG2183640
(S) Tetrachloro-m-xylene	*77.9*		*10.0-139*		*12/07/2023 00:55*	WG2183640

Pesticides (GC) by Method 8081B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Aldrin	ND		0.0200	1	12/07/2023 01:03	WG2183640
Alpha BHC	ND		0.0200	1	12/07/2023 01:03	WG2183640
Beta BHC	ND		0.0200	1	12/07/2023 01:03	WG2183640
Delta BHC	ND		0.0200	1	12/07/2023 01:03	WG2183640
Gamma BHC	ND		0.0200	1	12/07/2023 01:03	WG2183640
Chlordane	ND		0.300	1	12/07/2023 01:03	WG2183640
4,4-DDD	ND		0.0200	1	12/07/2023 01:03	WG2183640
4,4-DDE	0.0718		0.0200	1	12/07/2023 01:03	WG2183640
4,4-DDT	ND		0.0200	1	12/07/2023 01:03	WG2183640
Dieldrin	ND		0.0200	1	12/07/2023 01:03	WG2183640
Endosulfan I	ND		0.0200	1	12/07/2023 01:03	WG2183640
Endosulfan II	ND		0.0200	1	12/07/2023 01:03	WG2183640
Endosulfan sulfate	ND		0.0200	1	12/07/2023 01:03	WG2183640
Endrin	ND		0.0200	1	12/07/2023 01:03	WG2183640
Endrin aldehyde	ND		0.0200	1	12/07/2023 01:03	WG2183640
Endrin ketone	ND		0.0200	1	12/07/2023 01:03	WG2183640
Hexachlorobenzene	ND		0.0200	1	12/07/2023 01:03	WG2183640
Heptachlor	ND		0.0200	1	12/07/2023 01:03	WG2183640
Heptachlor epoxide	ND		0.0200	1	12/07/2023 01:03	WG2183640
Methoxychlor	ND		0.0200	1	12/07/2023 01:03	WG2183640
Toxaphene	ND		0.400	1	12/07/2023 01:03	WG2183640
(S) Decachlorobiphenyl	*73.3*		*10.0-135*		*12/07/2023 01:03*	WG2183640
(S) Tetrachloro-m-xylene	*77.2*		*10.0-139*		*12/07/2023 01:03*	WG2183640

Pesticides (GC) by Method 8081B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Aldrin	ND		0.0200	1	12/07/2023 01:12	WG2183640
Alpha BHC	ND		0.0200	1	12/07/2023 01:12	WG2183640
Beta BHC	ND		0.0200	1	12/07/2023 01:12	WG2183640
Delta BHC	ND		0.0200	1	12/07/2023 01:12	WG2183640
Gamma BHC	ND		0.0200	1	12/07/2023 01:12	WG2183640
Chlordane	ND		0.300	1	12/07/2023 01:12	WG2183640
4,4-DDD	ND		0.0200	1	12/07/2023 01:12	WG2183640
4,4-DDE	0.0536		0.0200	1	12/07/2023 01:12	WG2183640
4,4-DDT	ND		0.0200	1	12/07/2023 01:12	WG2183640
Dieldrin	ND		0.0200	1	12/07/2023 01:12	WG2183640
Endosulfan I	ND		0.0200	1	12/07/2023 01:12	WG2183640
Endosulfan II	ND		0.0200	1	12/07/2023 01:12	WG2183640
Endosulfan sulfate	ND		0.0200	1	12/07/2023 01:12	WG2183640
Endrin	ND		0.0200	1	12/07/2023 01:12	WG2183640
Endrin aldehyde	ND		0.0200	1	12/07/2023 01:12	WG2183640
Endrin ketone	ND		0.0200	1	12/07/2023 01:12	WG2183640
Hexachlorobenzene	ND		0.0200	1	12/07/2023 01:12	WG2183640
Heptachlor	ND		0.0200	1	12/07/2023 01:12	WG2183640
Heptachlor epoxide	ND		0.0200	1	12/07/2023 01:12	WG2183640
Methoxychlor	ND		0.0200	1	12/07/2023 01:12	WG2183640
Toxaphene	ND		0.400	1	12/07/2023 01:12	WG2183640
(S) Decachlorobiphenyl	*71.5*		*10.0-135*		*12/07/2023 01:12*	WG2183640
(S) Tetrachloro-m-xylene	*78.0*		*10.0-139*		*12/07/2023 01:12*	WG2183640

Method Blank (MB)

(MB) R4009446-1 12/06/23 15:00

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Aldrin	U		0.00376	0.0200
Alpha BHC	U		0.00368	0.0200
Beta BHC	U		0.00379	0.0200
Delta BHC	U		0.00346	0.0200
Gamma BHC	U		0.00344	0.0200
Chlordane	U		0.103	0.300
4,4-DDD	U		0.00370	0.0200
4,4-DDE	U		0.00366	0.0200
4,4-DDT	U		0.00627	0.0200
Dieldrin	U		0.00344	0.0200
Endosulfan I	U		0.00363	0.0200
Endosulfan II	U		0.00335	0.0200
Endosulfan sulfate	U		0.00364	0.0200
Endrin	U		0.00350	0.0200
Endrin aldehyde	U		0.00339	0.0200
Endrin ketone	U		0.00711	0.0200
Hexachlorobenzene	U		0.00346	0.0200
Heptachlor	U		0.00428	0.0200
Heptachlor epoxide	U		0.00339	0.0200
Methoxychlor	U		0.00484	0.0200
Toxaphene	U		0.124	0.400
(S) Decachlorobiphenyl	*88.9*			*10.0-135*
(S) Tetrachloro-m-xylene	*91.0*			*10.0-139*

Laboratory Control Sample (LCS)

(LCS) R4009446-2 12/06/23 15:11

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Aldrin	0.0666	0.0291	43.7	34.0-136	
Alpha BHC	0.0666	0.0298	44.7	34.0-139	
Beta BHC	0.0666	0.0307	46.1	34.0-133	
Delta BHC	0.0666	0.0289	43.4	34.0-135	
Gamma BHC	0.0666	0.0293	44.0	34.0-136	
4,4-DDD	0.0666	0.0305	45.8	33.0-141	
4,4-DDE	0.0666	0.0312	46.8	34.0-134	
4,4-DDT	0.0666	0.0313	47.0	30.0-143	
Dieldrin	0.0666	0.0285	42.8	35.0-137	
Endosulfan I	0.0666	0.0271	40.7	34.0-134	

Laboratory Control Sample (LCS)

(LCS) R4009446-2 12/06/23 15:11

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Endosulfan II	0.0666	0.0301	45.2	35.0-132	
Endosulfan sulfate	0.0666	0.0283	42.5	35.0-132	
Endrin	0.0666	0.0303	45.5	34.0-137	
Endrin aldehyde	0.0666	0.0271	40.7	23.0-121	
Endrin ketone	0.0666	0.0285	42.8	35.0-144	
Hexachlorobenzene	0.0666	0.0314	47.1	33.0-129	
Heptachlor	0.0666	0.0309	46.4	36.0-141	
Heptachlor epoxide	0.0666	0.0304	45.6	36.0-134	
Methoxychlor	0.0666	0.0294	44.1	28.0-150	
(S) Decachlorobiphenyl			*85.6*	*10.0-135*	
(S) Tetrachloro-m-xylene			*89.3*	*10.0-139*	

L1683706-14 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1683706-14 12/06/23 18:57 • (MS) R4009446-3 12/06/23 19:07 • (MSD) R4009446-4 12/06/23 19:17

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aldrin	0.0643	ND	0.0541	0.0450	84.1	69.7	1	20.0-135			18.4	37
Alpha BHC	0.0643	ND	0.0583	0.0488	90.7	75.5	1	27.0-140			17.7	35
Beta BHC	0.0643	ND	0.0599	0.0499	93.2	77.2	1	23.0-141			18.2	37
Delta BHC	0.0643	ND	0.0573	0.0476	89.1	73.7	1	21.0-138			18.5	35
Gamma BHC	0.0643	ND	0.0577	0.0482	89.7	74.6	1	27.0-137			17.9	36
4,4-DDD	0.0643	ND	0.0585	0.0469	91.0	72.6	1	15.0-152			22.0	39
4,4-DDE	0.0643	ND	0.0591	0.0480	91.9	74.3	1	10.0-152			20.7	40
4,4-DDT	0.0643	ND	0.0576	0.0458	89.6	70.9	1	10.0-151			22.8	40
Dieldrin	0.0643	ND	0.0545	0.0447	84.8	69.2	1	17.0-145			19.8	37
Endosulfan I	0.0643	ND	0.0528	0.0452	82.1	70.0	1	20.0-137			15.5	36
Endosulfan II	0.0643	ND	0.0569	0.0458	88.5	70.9	1	15.0-141			21.6	37
Endosulfan sulfate	0.0643	ND	0.0551	0.0446	85.7	69.0	1	15.0-143			21.1	38
Endrin	0.0643	ND	0.0562	0.0457	87.4	70.7	1	19.0-143			20.6	37
Endrin aldehyde	0.0643	ND	0.0563	0.0454	87.6	70.3	1	10.0-139			21.4	40
Endrin ketone	0.0643	ND	0.0558	0.0448	86.8	69.3	1	17.0-149			21.9	38
Hexachlorobenzene	0.0643	ND	0.0594	0.0511	92.4	79.1	1	25.0-126			15.0	35
Heptachlor	0.0643	ND	0.0581	0.0484	90.4	74.9	1	22.0-138			18.2	37
Heptachlor epoxide	0.0643	ND	0.0575	0.0473	89.4	73.2	1	22.0-138			19.5	36
Methoxychlor	0.0643	ND	0.0527	0.0417	82.0	64.6	1	10.0-159			23.3	40
(S) Decachlorobiphenyl					*87.9*	*71.1*		*10.0-135*				
(S) Tetrachloro-m-xylene					*87.9*	*77.6*		*10.0-139*				

Method Blank (MB)

(MB) R4009583-1 12/06/23 22:41

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Aldrin	U		0.00376	0.0200
Alpha BHC	U		0.00368	0.0200
Beta BHC	U		0.00379	0.0200
Delta BHC	U		0.00346	0.0200
Gamma BHC	U		0.00344	0.0200
Chlordane	U		0.103	0.300
4,4-DDD	U		0.00370	0.0200
4,4-DDE	U		0.00366	0.0200
4,4-DDT	U		0.00627	0.0200
Dieldrin	U		0.00344	0.0200
Endosulfan I	U		0.00363	0.0200
Endosulfan II	U		0.00335	0.0200
Endosulfan sulfate	U		0.00364	0.0200
Endrin	U		0.00350	0.0200
Endrin aldehyde	U		0.00339	0.0200
Endrin ketone	U		0.00711	0.0200
Hexachlorobenzene	U		0.00346	0.0200
Heptachlor	U		0.00428	0.0200
Heptachlor epoxide	U		0.00339	0.0200
Methoxychlor	U		0.00484	0.0200
Toxaphene	U		0.124	0.400
(S) Decachlorobiphenyl	*83.3*			*10.0-135*
(S) Tetrachloro-m-xylene	*86.8*			*10.0-139*

Laboratory Control Sample (LCS)

(LCS) R4009583-2 12/06/23 22:50

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Aldrin	0.0666	0.0534	80.2	34.0-136	
Alpha BHC	0.0666	0.0503	75.5	34.0-139	
Beta BHC	0.0666	0.0502	75.4	34.0-133	
Delta BHC	0.0666	0.0491	73.7	34.0-135	
Gamma BHC	0.0666	0.0506	76.0	34.0-136	
4,4-DDD	0.0666	0.0581	87.2	33.0-141	
4,4-DDE	0.0666	0.0564	84.7	34.0-134	
4,4-DDT	0.0666	0.0610	91.6	30.0-143	
Dieldrin	0.0666	0.0552	82.9	35.0-137	
Endosulfan I	0.0666	0.0501	75.2	34.0-134	

Laboratory Control Sample (LCS)

(LCS) R4009583-2 12/06/23 22:50

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Endosulfan II	0.0666	0.0540	81.1	35.0-132	
Endosulfan sulfate	0.0666	0.0532	79.9	35.0-132	
Endrin	0.0666	0.0579	86.9	34.0-137	
Endrin aldehyde	0.0666	0.0433	65.0	23.0-121	
Endrin ketone	0.0666	0.0543	81.5	35.0-144	
Hexachlorobenzene	0.0666	0.0521	78.2	33.0-129	
Heptachlor	0.0666	0.0570	85.6	36.0-141	
Heptachlor epoxide	0.0666	0.0533	80.0	36.0-134	
Methoxychlor	0.0666	0.0623	93.5	28.0-150	
(S) Decachlorobiphenyl			*86.2*	*10.0-135*	
(S) Tetrachloro-m-xylene			*73.4*	*10.0-139*	

L1683747-14 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1683747-14 12/07/23 01:21 • (MS) R4009583-3 12/07/23 01:30 • (MSD) R4009583-4 12/07/23 01:39

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aldrin	0.0649	ND	0.0533	0.0545	82.1	83.5	1	20.0-135			2.23	37
Alpha BHC	0.0649	ND	0.0529	0.0537	81.5	82.2	1	27.0-140			1.50	35
Beta BHC	0.0649	ND	0.0526	0.0539	81.0	82.5	1	23.0-141			2.44	37
Delta BHC	0.0649	ND	0.0517	0.0527	79.7	80.7	1	21.0-138			1.92	35
Gamma BHC	0.0649	ND	0.0530	0.0539	81.7	82.5	1	27.0-137			1.68	36
4,4-DDD	0.0649	ND	0.0559	0.0576	86.1	88.2	1	15.0-152			3.00	39
4,4-DDE	0.0649	ND	0.0550	0.0565	84.7	86.5	1	10.0-152			2.69	40
4,4-DDT	0.0649	ND	0.0566	0.0569	87.2	87.1	1	10.0-151			0.529	40
Dieldrin	0.0649	ND	0.0549	0.0548	84.6	83.9	1	17.0-145			0.182	37
Endosulfan I	0.0649	ND	0.0512	0.0502	78.9	76.9	1	20.0-137			1.97	36
Endosulfan II	0.0649	ND	0.0523	0.0515	80.6	78.9	1	15.0-141			1.54	37
Endosulfan sulfate	0.0649	ND	0.0493	0.0489	76.0	74.9	1	15.0-143			0.815	38
Endrin	0.0649	ND	0.0581	0.0595	89.5	91.1	1	19.0-143			2.38	37
Endrin aldehyde	0.0649	ND	0.0487	0.0469	75.0	71.8	1	10.0-139			3.77	40
Endrin ketone	0.0649	ND	0.0512	0.0528	78.9	80.9	1	17.0-149			3.08	38
Hexachlorobenzene	0.0649	ND	0.0555	0.0571	85.5	87.4	1	25.0-126			2.84	35
Heptachlor	0.0649	ND	0.0592	0.0598	91.2	91.6	1	22.0-138			1.01	37
Heptachlor epoxide	0.0649	ND	0.0538	0.0554	82.9	84.8	1	22.0-138			2.93	36
Methoxychlor	0.0649	ND	0.0550	0.0523	84.7	80.1	1	10.0-159			5.03	40
(S) Decachlorobiphenyl					*80.1*	*75.8*		*10.0-135*				
(S) Tetrachloro-m-xylene					*83.5*	*82.5*		*10.0-139*				

INTERNAL STANDARD SUMMARY

Instrument: SVGC18 • File ID: AVG

Sample ID	File ID	1-BROMO-2-NITROBENZENE Response
Standard	AVG	853908000
Upper Limit		1244109000
Lower Limit		414703000
BLANK R4009446-1 WG2183639 1x	1206_11	928314000
LCS R4009446-2 WG2183639 1x	1206_12	941693200
L1683747-01 WG2183639 1x	1206_29	963542800
L1683747-02 WG2183639 1x	1206_30	960832600
L1683747-03 WG2183639 1x	1206_31	914320800
MS R4009446-3 WG2183639 1x	1206_33	986148400
MSD R4009446-4 WG2183639 1x	1206_34	996779600

Instrument: SVGC42 • File ID: AVG

Sample ID	File ID	1-BROMO-2-NITROBENZENE Response
Standard	AVG	593669750
Upper Limit		807372000
Lower Limit		269124000
BLANK R4009583-1 WG2183640 1x	1206A_08	556245900
LCS R4009583-2 WG2183640 1x	1206A_09	626192800
L1683747-04 WG2183640 1x	1206A_10	628032500
L1683747-05 WG2183640 1x	1206A_11	686769500
L1683747-06 WG2183640 1x	1206A_12	681449500
L1683747-07 WG2183640 1x	1206A_13	661504300
L1683747-08 WG2183640 1x	1206A_14	716474500
L1683747-09 WG2183640 1x	1206A_15	694304600
L1683747-10 WG2183640 1x	1206A_16	684199700
L1683747-11 WG2183640 1x	1206A_17	666136000
L1683747-12 WG2183640 1x	1206A_18	713801900
L1683747-13 WG2183640 1x	1206A_19	675472500
L1683747-15 WG2183640 1x	1206A_20	630711700
L1683747-17 WG2183640 1x	1206A_22	680762400
L1683747-18 WG2183640 1x	1206A_23	677421200
L1683747-19 WG2183640 1x	1206A_24	684127000
L1683747-20 WG2183640 1x	1206A_25	712349700

INTERNAL STANDARD SUMMARY

Instrument: SVGC42 • File ID: AVG

Sample ID	File ID	1-BROMO-2-NITROBENZENE Response
L1683747-14 WG2183640 1x	1206A_26	688865900
MS R4009583-3 WG2183640 1x	1206A_27	670475500
MSD R4009583-4 WG2183640 1x	1206A_28	608923700

Instrument: SVGC42 • File ID: AVG

Sample ID	File ID	1-BROMO-2-NITROBENZENE Response
Standard	AVG	593669750
Upper Limit		807372000
Lower Limit		269124000
L1683747-16 WG2183640 10x	1207A_10	717972300

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
	The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
WSP (Formely Wood E&I)-Phoenix, AZ

4600 East Washington Street, Ste 600
Phoenix, AZ 85034

Billing Information:
Accounts Payable
4600 East Washington Street, Ste 600
Phoenix, AZ 85034

Pres Chk

Report to: **Jim Clarke**

Email To: **jim.clarke@wsp.com**

Project Description: **K&K**

City/State Collected:

Please Circle: PT MT CT ET

Phone: **602-733-6110**

Client Project #

Lab Project # **AMECTAZ-KANDK**

Collected by (print): Jacob Salmon

Collected by (signature):

Immediately Packed on Ice N ___ Y ___

Site/Facility ID #

P.O. # 1420212046.04 ~~1420212013~~

Quote #

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Date Results Needed

No. of Cntrs

Analysis / Container / Preservative

SV8081 4ozClr-NoPres

Chain of Custody Page 1 of 3

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
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SDG # 168374
D174

Acctnum: **AMECTAZ**
Template: **T242403**
Prelogin: **P1038692**
PM: **288 - Daphne Richards**
PB:

Shipped Via: **FedEX Ground**

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	SV8081 4ozClr-NoPres	Remarks	Sample # (lab only)
SP1-SS-113023-SO-N		SS		11/30/23	1140	1	X		-01
SP2-SS-113023-SO-N		SS			1130	1	X		-02
SP3-SS-113023-SO-N		SS			1125	1	X		-03
SP4-SS-113023-SO-N		SS			1200	1	X		-04
SP5-SS-113023-SO-N		SS			1240	1	X		-05
SP6-SS-113023-SO-N		SS			1245	1	X		-06
SP7-SS-113023-SO-N		SS			1100	1	X		-07
SP11-SS-113023-SO-N		SS			1210	1	X		-08
SP12-SS-113023-SO-N		SS			1205	1	X		-09
SP13-SS-113023-SO-N		SS			1115	1	X		-10

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist

COC Seal Present/Intact:	NP	Y N
COC Signed/Accurate:		Y N
Bottles arrive intact:		Y N
Correct bottles used:		Y N
Sufficient volume sent:		Y N
If Applicable		
VOA Zero Headspace:		Y N
Preservation Correct/Checked:		Y N
RAD Screen <0.5 mR/hr:		Y N

Relinquished by : (Signature)	Date: 12/1/23	Time: 1141	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	
Relinquished by : (Signature)	Date: 12/1/23	Time: 1510	Received by: (Signature)	Temp: 0.1°C 5.1+0=5.1	Bottles Received: 20
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature) Alexa Mitchell	Date: 12/2/23	Time: 0800

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

PWPF7

Company Name/Address:
WSP (Formely Wood E&I)-Phoenix, AZ

4600 East Washington Street, Ste 600
Phoenix, AZ 85034

Billing Information:
Accounts Payable
4600 East Washington Street, Ste 600
Phoenix, AZ 85034

Pres Chk

Report to:
Jim Clarke

Email To: **jim.clarke@wsp.com**

Project Description:
K&K

City/State Collected:

Please Circle: PT MT CT ET

Phone: **602-733-6110**

Client Project #

Lab Project #
AMECTAZ-KANDK

Collected by (print):
Jacob Salmon

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N___ Y___

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	SV8081 4ozClr-NoPres										Remarks	Sample # (lab only)
SP14-SS-113023-SO-N		SS		11/30/23	1235	1	X											-11
SP15-SS-113023-SO-N		SS			1110	1	X											-13
SP16-SS-113023-SO-N		SS			1045	1	X											-13
SP17-SS-113023-SO-N		SS			1035	1	X											-14
[illegible]		SS				1	X											→
SP20-SS-113023-SO-N		SS			1005	1	X											-15
SP21-SS-113023-SO-N		SS			1010 1305	1	X											-16
SP22-SS-113023-SO-N		SS			1305	1	X											-17
SP23-SS-113023-SO-N		SS			1310	1	X											-18
SP24-SS-113023-SO-N		SS			1025	1	X											-19

Chain of Custody Page 2 of 3

Pace
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MT JULIET, TN

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SDG # 168374

Table #

Acctnum: **AMECTAZ**

Template: **T242403**

Prelogin: **P1038692**

PM: **288 - Daphne Richards**

PB:

Shipped Via: **FedEX Ground**

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
	12/1/23	1141			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 0.8°C Bottles Received:	
	12/1/23	1800	SWA	5.1+0-5.1 20	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date:	Time:	Hold:	Condition: NCF / OK
			Alexa Mitchell	12/2/23	0800		

PWWTZ

Company Name/Address:
WSP (Formely Wood E&I)-Phoenix, AZ

4600 East Washington Street, Ste 600
Phoenix, AZ 85034

Billing Information:
Accounts Payable
4600 East Washington Street, Ste 600
Phoenix, AZ 85034

Pres Chk

Report to:
Jim Clarke

Email To: **jim.clarke@wsp.com**

Project Description:
K&K

City/State Collected:

Please Circle:
PT MT CT ET

Phone: **602-733-6110**

Client Project #

Lab Project #
AMECTAZ-KANDK

Collected by (print):
Jacob Salyon

Collected by (signature):

Immediately Packed on Ice N ___ Y ___

Site/Facility ID #

P.O. #

Quote #

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	SV8081 4ozClr-NoPres										Remarks	Sample # (lab only)
~~SP10-SS-113023-SO-N~~		SS		11/30/23	~~925~~	1	X											
SP19-SS-113023-SO-N		SS		11/30/23	1000	1	X											-20

Analysis / Container / Preservative

Chain of Custody Page 3 of 3

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SDG # 168747

Table #

Acctnum: **AMECTAZ**
Template: **T242403**
Prelogin: **P1038692**
PM: **288 - Daphne Richards**
PB:

Shipped Via: **FedEX Ground**

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
~~Sufficient volume sent:~~ __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
	12/1/23	1141			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: DYAFC Bottles Received:	
	12/1/23	1811		5.1+0-5.1 20	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold: Condition: NCF / OK
			Alexa Mitchell	12/2/23 0800	

APPENDIX

G STANDARD OPERATING PROCEDURES

Former K&K Applicator Site

Standard Operating Procedure No. 1
For
Utility Clearance

DECEMBER 2023

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONs

c	Field Sampling Plans
GPS	Global Positioning System
HASP	Health and Safety Plan
SOP	Standard Operating Procedure
WSP	WSP USA Environment & Infrastructure, Inc.

PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) provides technical guidance and procedures for utility clearances at the former K&K Applicator site located at Chandler Municipal Airport in Chandler, Arizona (Site). This SOP serves as a supplement to the removal action specific work plan and field sampling plan (FSP) and is intended to be used in conjunction with the other SOPs in this volume.

RESPONSIBLE PERSONNEL

The WSP USA Environment & Infrastructure, Inc. (WSP) project manager or designated Site manager has the overall responsibility for implementing this SOP. The project manager or designated Site manager will be responsible for assigning staff to implement this SOP and for ensuring that the procedures are followed by all personnel. The WSP Site manager is responsible for ensuring that the appropriate utility clearances have been performed prior to any intrusive field activities. All utility clearances will comply with applicable portions of the project-specific health and safety plan (HASP).

PROCEDURES

The following methods will be employed to perform utility clearances at the work site. Before conducting intrusive field activities, the project or field engineer/geologist must contact all utilities or facility personnel necessary to receive clearance to drill or trench at specified locations.

Prior to conducting utility clearance, the boundary of the treatment area will be surveyed and staked.

AZ811

AZ811 must be contacted at 1-602-263-1100 prior to soil sampling. AZ811 will contact the appropriate utility companies. The Site is located within the secured area of Chandler Municipal Airport. Therefore, utility company personnel must contact Mr. Scott Rinkenberger, Airport Operations Manager at 480-782-3546 to arrange access to the Site. The utility companies will identify their utilities with spray paint on the ground.

PRIVATE UTILITY LOCATING SERVICE

A private utility locator will be subcontracted to locate using geophysical methods and mark subsurface private utilities at each soil sampling location where such utilities may exist. Mr. David Sorensen will be contacted prior to sampling to mark utilities.

Former K&K Applicator Site

Standard Operating Procedure No. 2
For
Equipment Decontamination

DECEMBER 2023

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONs

HASP	Health and Safety Plan
IDW	Investigative-derived waste
PPE	Personal Protection Equipment
SOP	Standard Operating Procedure

PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) provides technical guidance and methods that will be used to conduct decontamination of investigation equipment during removal actions at the former K&K Aerial Applicator site at the City of Chandler Municipal Airport (Site). This SOP serves as a supplement to the Removal Action Plan (RAP) and is intended to be used in conjunction with the other SOPs included with RAP.

MATERIALS AND EQUIPMENT

The following materials and equipment may be needed for equipment decontamination.

- Sampling equipment and personal protective equipment (PPE) as outlined in the Site-Specific Health and Safety Plan (HASP).
- Decontamination equipment and supplies (e.g., spray bottles, brushes, Liquinox®, paper towels, sponges, disposable wipes, potable water, distilled water and/or deionized water).

PROCEDURES

The following procedures will be implemented to prevent cross-contamination between sampling points and exploration locations. Sampling methods will use disposable tools and materials whenever possible to minimize generating liquid investigative-derived waste (IDW). Non-disposable sampling equipment will be decontaminated upon arrival to the Site (if required), prior to leaving the Site, and between sampling activities at different explorations. All non-disposable equipment will be decontaminated between each sample. Generally, the non-disposable equipment will be decontaminated over the sample location using spray bottles followed by wiping with a paper towel. Reagent-grade deionized water will be poured over the sampling equipment and collected in appropriate sample containers.

SOIL SAMPLING EQUIPMENT DECONTAMINATION

Soil samples are scheduled to be collected using non-disposable equipment that includes stainless steel trowels. This equipment will be decontaminated after collection of each sample. Decontamination will be performed prior to collection of each sample as follows:

- Wipe remaining surface debris, if any, with clean paper towel (or equivalent disposable material).
- Spray-wash object with a non-phosphate detergent (Liquinox® or equivalent) and potable water.
- Spray-wash with potable water. Spray-rinse object with distilled/deionized water.
- Wipe dry the equipment with a clean paper towel.
- Decontamination fluids will be poured on the treated soil.

Heavy equipment used for excavation and soil treatment must be decontaminated prior to leaving the Site to prevent potentially contaminated soil from being transported off-Site. This is also a requirement of the stormwater protection permit. A tire wash/equipment decontamination area will be established on-Site. Soil and decontamination water will be stored on a decontamination pad. Soil will be returned to a previously untreated decision unit for treatment. Decontamination fluids will be allowed to evaporate or will be placed on untreated soil within the contaminated area.

DECONTAMINATION DOCUMENTATION

Field personnel will be responsible for documenting proper sampling and heavy equipment decontamination. The purpose of documentation is to demonstrate in the written field record that decontamination was performed in accordance with this SOP. Decontamination activities will be documented at least each day they are performed. The documentation will be recorded in a logbook or on appropriate project forms (i.e., boring log, sample field data sheets). The information recorded concerning decontamination will include:

- Date and times of decontamination
- Location of decontamination activities (i.e., sample site, central decontamination facility)
- Decontamination personnel and materials
- Decontamination steps/observations
- Other applicable information

Former K&K Applicator Site

Standard Operating Procedure No. 3
For
Soil Sampling

DECEMBER 2023

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONs

AOC	Area of Concern
bgs	below ground surface
DU	Decision unit
ft	foot, feet
QA/QC	Quality Assurance/Quality Control
SOP	Standard Operating Procedure
USCS	Unified Soil Classification System
USEPA	United States Environmental Protection Agency

PURPOSE AND SCOPE

The purpose of this Standard Operating Procedure (SOP) is to describe the general methodology for collecting soil samples at the K&K Aerial Applicator site located at the City of Chandler Municipal Airport (the Site). This SOP applies to all personnel who collect and/or handle surface soil samples during Site activities.

Collecting soil samples is an important remediation confirmation activity. Soil samples are used to determine if remedial activities have achieved the soil cleanup goals and to determine the geotechnical, hydrogeologic, physical, and chemical properties of site soils. Field conditions at the site may preclude collection at one or more predetermined sample locations. Additional soil sampling may be required if unexpected conditions are observed during surface soil sampling activity. Proper sampling techniques, proper selection of sampling equipment, and proper decontamination procedures will eliminate cross-contamination and introduction of contaminants from external sources. Soil conditions can vary widely at a site. These variations can affect the rate of contaminant migration through the soil. Therefore, it is important that detailed records be maintained during sampling activities, particularly with respect to location, depth, color, odor, lithology, and readings derived from field monitoring equipment. All soils will be classified in the field by a geologist, hydrogeologist, or soil scientist using the Unified Soil Classification System (USCS).

METHODS

Soil samples will be collected using decontaminated stainless steel trowels.

All personnel who collect or handle the soil samples will wear disposable nitrile gloves to prevent cross-contamination and provide personal protection. New gloves will be donned between each soil sample, or whenever gloves are torn or otherwise compromised. Soil samples will be collected as discrete samples. Prior to conducting soil sampling, utility clearance will be performed in accordance with SOP No. 1, Utility Clearance.

Equipment that will be used to collect soil samples includes, but is not limited to, the following items:

- Stainless steel trowels;
- Immunoassay analysis equipment (see Appendix A to this SOP);
- Nitrile rubber gloves;
- Field notebook/logbook/boring log;
- Waterproof/permanent marker;
- Paper towels;
- Appropriate decontamination equipment;
- Appropriate health and safety equipment;
- Sample cooler with ice;
- Sample jars and labels;
- Chain-of-custody forms;
- Munsell Soil Color Charts;
- Grain size charts;
- Hand lens; and,
- Ziploc® freezer bags.

All procedures presented in SOP No. 02, *Equipment Decontamination*, will be followed for decontamination of field equipment and for personnel decontamination. Decontamination solutions may be replenished between each site as needed. The sample containers will then be sealed tightly, and handled according to SOP No. 4,

Sample Handling. Immunoassay kits containing soil samples and spent reagent will be included in the cooler and will be disposed by Pace Analytical. Before collecting any soil samples, all sampling devices shall be decontaminated. Decontamination supplies will be available so that small equipment can be decontaminated on site. Each piece of sampling equipment shall be decontaminated before initiation of sampling operations and between each sample location or interval. Unused soil will be returned to the sample location.

SOIL TREATMENT CONFIRMATION SAMPLES

The soil treatment area includes treated soil outside the boundaries of the landfill area and the native soil beneath the landfill materials. Maximum sample depth will be 4.0 feet (ft) bgs. Up to five sample points will be located within each Decision Unit (DU) (**Figure 7** of the RAP). Discreet soil samples will be collected from the shallow interval (0-1 ft or 0-2 ft below ground surface [bgs]) and deep interval (1-2 ft or 2-4 ft bgs) from each sample point. Samples will be collected using a decontaminated stainless steel trowel.

There are an estimated 236 sample locations that will be advanced in 39 DUs. Therefore, 116 composite primary soil samples will initially be collected. Ten composite replicate samples will be analyzed, resulting in a total of 126 composite samples field screened for toxaphene. Additional samples may be collected to confirm re-treatment of DUs, if required.

FIELD SCREENING AND ANALYTICAL PROCEDURE

The field scientist will collect the necessary samples for logging and immunoassay screening. A decontaminated stainless steel trowel will be used to collect a scoop of soil from each discreet sample interval. Rocks will be removed from each scoop of soil. The scoops of soil will be placed in the 4-ounce sample jar until the jar is approximately 75% full. The sample jar will then be shaken to thoroughly mix the soil. A minimum of 116 composite samples are expected to be collected. Additional samples may be collected to confirm re-treatment of DUs, if required. A 5-gram aliquot will then be analyzed for toxaphene in the field using Beacon Analytical Systems, Inc. (Beacon) immunoassay kits per the Beacon Toxaphene Tube Kit Instructional Booklet attached as Appendix A to this SOP. The toxaphene detection range for the Beacon immunoassay test kits is 0-50 parts per million (ppm). Each Beacon immunoassay kit includes the following control standards and will provide the optical density (OD) for the below detection levels:

Negative Control (NC) – methanol only

Standard 1 – 2.0 ppm

Standard 2 – 10 ppm

An immunoassay kit consists of 100 assay tubes. To improve assay precision, Beacon recommends that the calibrator/control standards be screened in duplicate. Therefore, six tubes will be used for the control standards. The control standards are prepared the same as the field-screened samples as shown in the attached Beacon Instructional Brochure. The NC, which contains only the methanol reagent, must be tested for each sample kit. The OD for the NC must be recorded on the field log sheet (SOP No. 5). The minimum cleanup level for toxaphene is 5.0 ppm. The confirmation soil samples will be field screened using Standards 1 and 2. As recommended by Beacon, all soil samples will be screened in duplicate. Therefore, each tube kit containing 100 tubes will be able to screen 47 samples, minus the six tubes used for the control standards. Three 100 tube kits and a 40 tube kit will be provided. This will provide sufficient tubes to analyze 35 additional samples if re-runs or re-treatments are required. The following will be performed based on the field screening results:

— If the field screen result for a sample is >10 ppm and confirmed a week later by a second result, that DU will be re-treated and re-screened.

- If the field screen result for a sample is between 2.0 and 10 ppm, a confirmation sample will be collected a week later. If the result remains between 2.0 and 10 ppm, that sample will be submitted to Pace Analytical and analyzed for organochlorine pesticides by EPA Method 8081A on a 10-day turnaround. Analysis of toxaphene, DDE, and DDT will be requested; therefore, verbal results are expected to be available within five days. If toxaphene, DDE, or DDT exceed their respective 10^{-5} RSRLs, then that DU will be re-treated and re-screened.
- If the toxaphene field screen result for a sample is <2.0 ppm, that cell will be considered remediated. The sample will be submitted to Pace Analytical for confirmation analysis by EPA Method 8081A.

The OD for each control that is used and the OD for each sample will be recorded on the field log sheet and used to present the concentration range for the sample.

Samples to be selected for laboratory analysis will be discussed between the WSP Project Manager and Field Lead and will be based on field screening results and will be recorded on the sample log form. All samples used to confirm remediation will be submitted to Pace Analytical and analyzed for organochlorine Pesticides by US EPA Method 8081A on a standard 10-day turnaround. Ten replicate samples will be submitted.

DOCUMENTATION

Records of surface soil sampling activities will be documented in a bound field logbook in accordance with SOP No. 05, Documentation of Field Activities. Documentation shall include:

- Names of sampling personnel;
- Weather conditions;
- Project title;
- Sample location;
- Date and time of sampling;
- Method of sample collection;
- Sample identification numbers;
- Photo documentation, if applicable;
- Quality Assurance/Quality Control (QA/QC) samples collected; and
- Irregularities or problems.

Prepare the Sample/Extract the Soil

1. Please follow the instructions from the Soil Extraction Kit to prepare the soil extract before the assay.
2. 10 mL of Methanol will be used to extract Toxaphene residue from a 5 gram soil sample.

Perform the Test

1. Label the 12 mm X 75 mm test tubes (no more than 20 tubes/assay). You do not have to perform the assay in duplicate; however, doing so increases the precision of the test.
2. Place the test tubes in the test tube rack pressing down firmly on each tube so that they are secured.
3. Pipette 500 µL of Assay Diluent to all test tubes.
4. Attach a clean pipette tip to the positive displacement pipette and adjust the dial to "200" to pipette 20 µL.
5. Use the positive displacement pipettor to add the Negative Control (methanol), the toxaphene calibrators, and the Sample extracts and/or Sample extract dilutions to the appropriate test tubes. Replace the cap(s) to minimize evaporation.
6. Pipette 500 µL of enzyme conjugate into each tube.
7. Shake the rack to mix the contents of the tubes and allow the tubes to incubate for 10 minutes.
8. Empty the test tube contents into a sink or suitable container. Fill the test tubes to overflowing with cool tap or distilled water, then decant and vigorously shake out the remaining water.
9. Repeat this wash step three more times, being certain to shake out as much water as possible on each wash. After the final wash, remove as much water as possible by tapping the inverted tubes on absorbent paper.
10. Pipette 500 µL of Substrate into each tube.
11. Allow the color development to proceed for 10 minutes.
12. Pipet 500 µL of Stop Solution into each tube.

WARNING: Stop solution is 1.0 N hydrochloric acid. Handle carefully.

13. Add 1.0 mL of Stop Solution to the blank test tube and insert the tube into the Pocket Colorimeter™II. Press the blue zero key. Dry the outside of each assay tube and measure the absorbance by placing each tube into the photometer. Press the green "check" key. Record the absorbance of each tube.

RESULTS INTERPRETATION

1. Semi-quantitative results can be derived by simple comparison of the sample absorbances to the absorbance of the calibrator tubes: Samples containing less color than a calibrator well have a concentration of Toxaphene greater than the concentration of the calibrator. Samples containing more color than a calibrator well have a concentration less than the concentration of the calibrator.
2. Quantitative interpretation requires graphing the absorbances of the calibrators (Y-axis) versus the log of the calibrator concentration (X-axis) on semi-log graph paper. A straight line is drawn through the calibrator points and the sample absorbances are located on the line. The corresponding point on the X-axis is the concentration of the sample. Samples with absorbances greater than the lowest calibrator or less than the highest calibrator must be reported as <2 ppm or >50 ppm, respectively. A spreadsheet that will perform the curve fit and sample calculations can be provided upon request.

QUALITY CONTROL

If a blue color does not develop in the negative control test tube within 5 minutes after you add the substrate solution, the test is invalid and you must repeat the entire test.

TECHNICAL ASSISTANCE

For questions regarding this kit or for additional information about Beacon products, call (207) 571-4302.

SAFETY

To receive complete safety information on this product, contact Beacon Analytical Systems, Inc. and request Material Safety Data Sheets. Stop Solution is 1N hydrochloric acid. Handle with care.

General Limited Warranty

Beacon Analytical Systems, Inc. ("Beacon") warrants the products manufactured by it against defects in materials and workmanship when used in accordance with the applicable instructions for a period not to extend beyond a product's printed expiration date. BEACON MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED. THERE IS NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. The warranty provided herein and the data, specifications and descriptions of Beacon products appearing in published catalogues and product literature may not be altered except by express written agreement signed by an officer of Beacon. Representations, oral or written, which are inconsistent with this warranty or such publications are not authorized and, if given, should not be relied upon.

In the event of a breach of the foregoing warranty, Beacon's sole obligation shall be to repair or replace, at its option, any product or part thereof that proves defective in materials or workmanship within the warranty period, provided the customer notifies Beacon promptly of any such defect. The exclusive remedy provided herein shall not be deemed to have failed of its essential purpose so long as Beacon is willing and able to repair or replace any nonconforming Beacon product or part. Beacon shall not be liable for consequential, incidental, special or any other indirect damages resulting from economic loss or property damage sustained by a customer from the use of its products. However, in some states the purchaser may have rights under state law in addition to those provided by this warranty.

BEACON ANALYTICAL SYSTEMS, INC.
82 Industrial Park Road
Saco, ME 04072
Tel. (207) 571-4302
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Beacon Analytical Systems Inc.

Toxaphene Tube Kit

Cat.# 20-0148

Instructional Booklet

READ COMPLETELY BEFORE USE.

INTENDED USE

The Toxaphene in Soil Test Kit is an enzyme immunoassay for the detection of toxaphene in soil. The Toxaphene Test Kit permits reliable and rapid semi-quantitative screening for toxaphene at a range of 0 to 50 parts per million (ppm) in soils.

ASSAY PRINCIPLES

The Toxaphene in Soil Test Kit is a competitive enzyme-labeled immunoassay. The test kit uses polyclonal antibodies that bind either Toxaphene or Toxaphene-enzyme conjugate. When Toxaphene is present in the sample, it competes with the Toxaphene-enzyme conjugate for a limited number of toxaphene binding sites on the immobilized antibodies.

An assay diluent and a sample containing Toxaphene is added to a test tube. This is followed by the addition of Toxaphene-enzyme conjugate and the mixture is allowed to incubate for 10 minutes. The Toxaphene-enzyme conjugate competes with the Toxaphene for the antibody binding sites. In the assay procedure you will:

- Add a sample or calibrator containing Toxaphene to a test tube.
- Add Toxaphene enzyme conjugate. The conjugate competes with any Toxaphene in the sample for the same antibody binding sites.
- Wash away any unbound molecules, after you incubate this mixture for 10 minutes.
- Add clear substrate solution to each test tube. In the presence of bound Toxaphene -enzyme conjugate, the substrate is converted to a blue compound. One enzyme molecule can convert many substrate molecules.

Since the same number of antibody binding sites are available in every test tube, and each tube receives the same number of Toxaphene-enzyme conjugate molecules, a sample containing a low concentration of Toxaphene allows the antibody to bind many Toxaphene -enzyme conjugate molecules. The result is a dark blue solution. Conversely, a high concentration of Toxaphene allows fewer Toxaphene-enzyme conjugate molecules to be bound by the antibodies, resulting in a lighter blue solution.

NOTE: Color is inversely proportional to Toxaphene concentration.

Darker color = Lower concentration

Lighter color = Higher concentration

Soil sampling error may significantly affect testing reliability. The distribution of Toxaphenes in different soils can be extremely heterogeneous.

You should homogenize soils thoroughly before analysis by any method. Split samples (e.g., for GC and immunoassay) should always come from the same homogenate.

To ensure accurate and reliable results, you should make every effort to perform the Toxaphene in Soil test at temperatures between 15°C (59°F) and 30°C (86°F).

PERFORMANCE CHARACTERISTICS

Sensitivity

The sensitivity is sufficient to perform the test at each calibrator level with 95% confidence. The minimum reliable detection limit for the Toxaphene is 2 ppm in soil.

SPECIFICITY

The Beacon Toxaphene Tube Kit is specific for Toxaphene and closely related compounds. The following table shows the % cross-reactivity versus toxaphene.

Compound	% Cross Reactivity
Toxaphene	100%
Heptachlor	< 1%
Chlordane	< 1 %
Dieldrin	< 1%
Endin	< 1%
Endosulfan	< 1%
Lindane	60%

PRECAUTIONS

1. Each reagent is optimized for use in the Toxaphene Tube Kit. Do not substitute reagents from any other manufacturer into the test kit. Do not combine reagents from other Toxaphene Tube Kits with different lot numbers.
2. Dilution or adulteration of reagents or samples not called for in the procedure may produce inaccurate results.
3. Do not use reagents after expiration date.
4. Store all test kit components at 4 degrees Celsius (°C) to 8°C (39 degrees Fahrenheit (°F) to 46°F) when not in use. Storage at ambient temperature (18°C to 27°C or 64°F to 81°F) on the day of use is acceptable.
5. Reagents should be brought to room temperature, 20 – 28ºC (62 – 82ºF) prior to use. Avoid prolonged (> 24 hours) storage at room temperature. Do not freeze test kit components or expose them to temperatures greater than 37°C (99°F).
6. The Stop Solution is 1N hydrochloric acid. Avoid contact with skin and mucous membranes. Immediately clean up any spills and wash area with copious amounts of water. If contact should occur, immediately flush with copious amounts of water.
7. Treat Toxaphene, solutions that contain Toxaphene, and potentially contaminated soil samples as hazardous materials. Use gloves, proper protective clothing, and means to contain and handle hazardous material where appropriate.
8. Use approved methodologies to confirm any positive results.
9. Soils obtained from areas adjacent to standing water, surface soils collected during or immediately after rain or snow, or any soils with relatively high amounts of water (>30% by weight) should be dried before testing. Contact technical service for recommended methods.
10. Distribution of Toxaphene in soils may be highly variable. This variability can be minimized through use of a composite sampling technique. Adequate sample number and distribution are the responsibility of the analyst.

REAGENTS AND MATERIALS PROVIDED

The kit in its original packaging can be used until the end of the month indicated on the box label when stored at 2 – 8ºC.

40 Toxaphene antibody-coated, 12 mm X 75 mm polystyrene test tubes in 2 foil bags.

1 vial containing 3 mL of Negative Control (Methanol) .

3 vials containing 2 mL of Toxaphene calibrators at 2, 10 and 50ppm. (Note: Because of the 1:2 dilution of the soil sample in the extraction step, the calibrators actually contain 1/2 of the stated value. No further correction back to the concentration in the original soil sample is required.)

1 bottle Toxaphene-enzyme conjugate

1 bottle of Assay Diluent

1 bottle of Substrate.

1 bottle of Stop Solution. (Caution! 1N HCl. Handle with care.)

MATERIALS REQUIRED BUT NOT PROVIDED

- Photometer for reading absorbance at 450nm in 12mm x 75mm tubes. The photometer allows you to measure results in the form of optical density values. These values can be used for objective record keeping, quality assurance, or semi-quantitative determination of sample concentrations.
- Soil Extraction Kit- The soil extraction kit provides all additional materials required for the extraction of soil samples.
- Methanol (10 mL per sample) is required for soil extractions.
- A pipette capable of delivering 10 mL for addition of methanol to soil samples for extraction.
- Clean running water or a wash bottle containing tap or deionized water.
- Pipet with disposable tips capable of dispensing 500 µL.
- Positive displacement pipet with disposable tips capable of delivering 20 µL.
- Paper towels or equivalent absorbent material.
- Timer
- A repeating pipette capable of delivering variable volumes is recommended for running more than 10 tubes in one assay.

TEST PROCEDURE (Note: Running calibrators and samples in duplicate will improve assay precision and accuracy.)

Collect/Store the Sample

1. Collect soil in appropriately sized and labeled containers. Take care to remove excess twigs, organic matter, and rocks or pebbles from the soil sample to be tested.
2. Soils obtained from areas adjacent to standing water, surface soils collected during or immediately after rain or snow, or any soils with relatively high amounts of water (30% by weight) should be dried before testing.

NOTE: Contact technical service for recommended methods.

3. Storage of soil samples should follow the holding conditions recommended for EPA methods 8100 and 8310 (respectively

Former K&K Applicator Site

Standard Operating Procedure No. 4
For
Sample Handling

DECEMBER 2023

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONs

CFR	Code of Federal Regulations
COC	Chain of Custody
DOT	Department of Transportation
ID	Identification
MS/MSD	Matrix spike/matrix spike duplicate
QA/QC	Quality Assurance/Quality Control
SOP	Standard Operating Procedure
USPS	United States Postal Service

PURPOSE AND SCOPE

The purpose of this Standard Operating Procedure (SOP) is to assure representative environmental sample data by documenting the management of samples from time of collection through analysis and final disposition for the samples collected at the K&K Aerial Applicator site at the City of Chandler Municipal Airport (the Site).

This SOP applies to all personnel who collect and/or handle environmental samples.

CONTAINER AND PRESERVATION REQUIREMENTS

Most chemical and biological reactions and many physical processes are slowed by lowering the temperature. Therefore, all samples need to be cooled at the time of collection and maintained slightly above freezing until preparation for final analysis.

All sample containers will be supplied in advance by Beacon Analytical Systems, Inc or Eurofins Environment Testing America (Eurofins).

Container and preservation requirements are provided as **Table 1.**

SAMPLE IDENTIFICATION

Individual samples will be identified by a unique alphanumeric code (also referred to as the sample identification [ID] number) which will be written on the sample label and recorded on the Chain of Custody (COC) form. Use dashes only, no spaces or underscores are acceptable. There is an allowable limit of 30 characters.

SOIL SAMPLES

SOIL INVESTIGATIVE SAMPLES

The preferred naming convention for soil samples is as follows: Each sample ID will begin with the Location ID, followed by the Location Type, Sample Depth, Sample Date, Matrix Type, and Sample Type.

Location ID = Soil sample location IDs vary by nature. The location ID should include the site ID, the station #, the type of sample being collected, SD for sediment samples, SB for soil boring samples, or SS for soil samples.

Location Type = what type of location the sample is collected from, such as:

SS = soil sample

Sample Depth = Depth of sample collected. Standard format is XX.X-XX.Xxx. (example: 10.5-12.5ft). Use "ft" for feet and "in" for inches. Parentheses, inch or foot marks, or underscores are not acceptable.

Sample Date = date of sample collection in mmyy format (Example: 1217 = December 2017).

Matrix Type= matrix of sample being collected; standard examples are as follows:

SO = Soil (unspecified)

Sample Type = Type of sample being collected, please pick from the following as appropriate:

N = Normal Sample

FR = Field Replicate

MS = Matrix Spike

SD = Matrix Spike Duplicate

Some examples of soil sample IDs are included below:

DU8-SS-1'-0623-SO-N = where the site ID is decision unit 8 (DU-8); location type is a soil sample; depth collected is 0-1 ft; sample date is June 2023; matrix code is soil; and the sample type is a normal sample.

DU8-SS-1'-0623-SO-MS/SD = where the site ID is DU-8; location type is a soil sample; depth collected is 0-1 ft; sample date is June 2023; matrix code is soil; and the sample type is a MS/MSD.

SOIL QA/QC SAMPLES

Blind Field Duplicate samples should be named as follows:

DUP-X-mmyy-matrix code-sample type (example: DUP-1-0623-SO-FR). If more than one duplicate is collected on the same day, sequential numbering should be used. The true identity of duplicates/replicates will be recorded in the field notebook.

Equipment blank samples should be identified as *EB-X-mmyy-W*.

SAMPLE LABELS

Sample labels are required to prevent misidentification of samples. Sample labels will generally be pre-printed by a database technician and taken to the field.

The sample label will be affixed to the proper sample container at the time of the sampling event by the field sampler. The labels will contain the following pre-printed information:

- Sample ID number;
- Site ID;
- Event ID (if applicable);
- Location ID;
- Analyses requested;
- Receiving laboratory;
- Type of sample container;
- Preservatives used;
- Sample matrix; and
- MS/MSD if required.

During a sampling event, the field sampler will write the following information on the label:

- Field sampler's initials;
- Date (mm/dd/yy or m/d/yy, i.e., 04/03/98 or 4/3/98 is April 3, 1998); and
- Time of sample collection (military format).

SAMPLE PACKAGING AND SHIPPING

Environmental samples and quality control samples are collected, labeled, and sealed in the field, and COC is maintained.

40 Code of Federal Regulations (CFR) Part 261.4 describes sample shipping requirements. It states that:

"... a sample of solid waste or a sample of water, soil, or air, which is collected for the sole purpose of testing its characteristics or composition, is not subject to any requirements of this part (hazardous materials shipping requirements) when:

i) The sample is being transported to a laboratory for the purpose of testing; or

ii) The sample is being transported back to the sample collector after testing.

In order to qualify for the(se) exemption(s)..., a sample collector shipping samples to a laboratory and a laboratory returning samples to a sample collector must:

i) Comply with Department of Transportation (DOT), U.S. Postal Service (USPS), or any other applicable shipping requirements; or

ii) Comply with the following requirements if the sample collector determines that DOT, USPS, or other shipping requirements do not apply to the shipment of the sample:

(A) Assure that the following information accompanies the sample:

1) The sample collector's name, mailing address, and telephone number;

2) The laboratory's name, mailing address, and telephone number;

3) The quantity of the sample;

4) The date of shipment; and

5) A description of the sample.

(B) Package the sample so that it does not leak, spill, or vaporize from its packaging.

Samples will be assessed based on immunoassay results to determine potential hazard. Potentially hazardous samples are required by law to be properly handled and labeled.

Samples determined to be non-hazardous by the Sample Coordinator are environmental samples. They are to be labeled, packaged, documented, and shipped as described below:

- Determine the maximum allowable weight of each cooler (Federal Express limit for Priority Overnight shipping is 150 pounds).
- Place each container in a Ziploc® bag and seal, squeezing as much air as possible from the bag before closing. Glass bottles and jars will be wrapped in bubble wrap.
- Tape the cooler's drain plug shut on the inside and the outside, unless using dry ice in shipment.
- Place a large size plastic bag (trash bag) in the cooler to contain samples.
- Place the bottles upright in the plastic bag, with enough room for ice bags to be placed among and around the containers and insulate with enough bubble wrap to deter breakage.
- Place ice (double-bagged) among the containers along the walls and top of each cooler in a manner to ensure uniform cooling. When shipping soil samples, place one bag of ice along the bottom of the cooler as well. For water samples, it is possible to place the bottles upright in absorbent material to provide additional stability. Do not use Blue Ice, as its heat capacity is lower than regular ice. If the Sample Shipper/Controller is informed by the laboratory that the samples are not being chilled sufficiently, additional ice may be required. Note that in summer months, more ice may be needed to ensure the samples arrive cold at the laboratory.
- If shipping via commercial carrier (e.g., Federal Express), write the carrier's airbill number on the COC form, place the appropriate pages of the COC form inside a Ziploc® bag, and seal the bag with a signed, dated custody seal. The COC form has three pages. The original and one copy are sealed inside the Ziploc® bag and placed inside the cooler. One copy goes to project data management, and one copy (made by the Field Manager) is placed in field files. The COC form sent to the laboratory must be completed with all designated information, the pages must be originals (not photocopies), and the COC must be unique to the samples contained in the cooler.

- If a courier from the laboratory is collecting the samples and delivering them to the laboratory, have the courier confirm that all samples listed are present, and then sign the COC form. Tape the Ziploc® bag, with the COC form, to the inside lid of the cooler and then close and latch the cooler.
- Wrap strapping tape completely around the cooler on both sides of the latch.
- Affix the shipping label with the address and telephone number of the laboratory and the contractor.
- Affix signed custody seals on the front right and back left of the cooler across the lid, so as to tear if the cooler is opened during shipping.
- The laboratory should be notified if the samples are being delivered via courier. They should be prepared to receive and check the samples and sign the COC form as the sample receiver.

CHAIN-OF-CUSTODY PROCEDURE

COC forms are used to legally track samples from time of collection through completion of laboratory analysis.

The following information will be preprinted on the COC form when possible:

- Project name;
- Name and address of laboratory; and
- Potential analysis and method numbers.

The following information will be written on the COC form by the sample controller/shipper:

- Site name;
- Name of receiving laboratory;
- Sample IDs for all samples in a particular cooler/shipping container;
- Sample matrix or matrix code (e.g., "SO" for soil);
- Sample type (environmental, "TB", "EB", etc.), which is encrypted in the sample ID code;
- Analysis requested by method number unless other arrangements are made with the receiving laboratory;
- Number of containers;
- QC required (to indicate the sample is to be used for MS/MSD analyses);
- Date of collection (mm/dd/yy or m/dd/yy: 04/03/23 or 4/3/23 is April 3, 2023);
- Time of collection (military format);
- Signature of individual who prepares the COC form;
- Cooler ID;
- Carrier service and airbill number; and
- Signature of individual relinquishing samples along with the date and time of relinquishment.

Upon completion of the form, retain two copies and affix the original and one copy to the inside of the sample cooler (in a Ziploc® bag to protect from moisture), to be sent to the designated laboratory.

Every person involved with sample collection and handling will know and understand the COC form. The sample shipper will complete the COC form while preparing the samples for shipment. This individual or other authorized person will sign the "Relinquished By" box and enter the shipper's name in the "Received By" box prior to sealing a sample shipping container for courier pickup after ensuring that samples and COC forms match (in other words, only samples identified on the enclosed COC forms are in the container and all samples enclosed are listed on the COC forms enclosed). The "Received By" box will be signed by the laboratory sample receipt staff. As long as COC forms are sealed inside the sample shipping container, commercial carriers are not required to sign the COC form.

Distribution of the COC form will be:

Original and one copy – sealed in plastic bag and taped inside the top of the shipping container;

— One copy – file in appropriate Field Office project file; and
— One copy – submit to Data Management staff.

All changes to a COC form will be made by striking the incorrect information with a single line, initialing, and dating the strike, and inserting the correct information. If changes are made to a COC form after the original distribution, the following steps will be taken:

— Make the change by striking the incorrect information with a single line, initialing, and dating the strike, and inserting the correct information (in black or blue indelible ink). Add a comment as to why the change was made, as appropriate; and,
— Distribute copies of the corrected COC form as specified above.

Whenever a sample is split with a second party (e.g., client, agency) a separate COC form must be prepared for those samples.

TABLE 1 REQUIREMENTS FOR ENVIRONMENTAL SAMPLES COLLECTED AT THE SITE

ANALYTICAL PARAMETER	ANALYTICAL METHOD	MATRIX	CONTAINER	HOLDING TIME (FROM SAMPLE DATE)	PRESERVATION
Pesticides	Beacon	Soil	4-ounce glass jar	Extract and analyze in field per Beacon SOP in Appendix A of SOP No. 3.	Cool: 4° – 8° C
Pesticides	EPA 8081	Soil	4-ounce glass jar	8081 – Extract within 14-days, analyze extract within 40 days.	Cool: 0° – 6° C
Equipment Blank Samples					
Pesticides	EPA 8081	Water	Amber bottle	Extract within 7 days; analyze within 40 days	Cool: 0° – 6° C

Notes:

℃ = Degrees Celsius

Former K&K Applicator Site

Standard Operating Procedure No. 5
For
Documentation of Field Activities

DECEMBER 2023

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONs

COC	Chain-of-custody
FDR	Field data record
IDW	Investigative-derived waste
QAPP	Quality assurance project plan
SAP	Sampling and Analysis Plan
SOP	Standard Operating Procedure
WSP	WSP USA Environment & Infrastructure, Inc.

PURPOSE AND SCOPE

Documentation of field activities for the K&K Aerial Applicator site located at the City of Chandler Airport (Site) will be completed using a combination of Site logs, field logbooks, field data records (FDRs), sample tracking systems, sample custody records, and photographs. Site logs and field logbooks are completed to provide a general record of activities and events that occur during each field task. FDRs will be used for sample collection and should provide a complete record of data obtained during the activity. The sample custody procedures are intended to ensure that each collected sample is accounted for at all times (see Standard Operating Procedure [SOP] No. 4, Sample Handling, and that photographs of field activities provide a visual record of significant changes in site conditions and events.

Deviations from the procedures specified in the Former K&K Site Removal Action Plan and SOPs (collectively referred to as the SAP) must be clearly documented in the Site log and/or field logbooks and applicable field data records. Documentation will include at a minimum: specific changes or modifications to procedures; reasons for the deviations; authorization for changes; and interpreted impacts to the data quality.

The WSP Environment & Infrastructure Solutions, Inc. (WSP) Field Lead will identify sections of the SAP that must be reviewed prior to conducting a specific field activity and will include at a minimum, applicable investigation techniques and procedures, decontamination procedures, field chain-of-custody (COC) procedures and investigative-derived waste (IDW) handling.

PROCEDURES

SITE LOG AND FIELD LOGBOOKS

The Site log and field logbooks provide a daily account of the field program progress. Tablets will be used to complete the Site log and field logbook. Therefore, both will be maintained electronically.

SITE LOG

The Site log is a record of all site activities completed for each day of operation, completed by the WSP Field Lead. This document will be maintained electronically. Entries are to be made each day to document the important activities of that day. At a minimum, the site log will contain the following information:

- Names, titles, and affiliation of all project-related personnel present at the site during each day of field operations
- A brief summary of all activities completed for each day of field operation
- A listing of any changes made to the established program procedures
- A summary of any problems encountered during the day including a description of corrective actions and potential impacts on the project
- A summary of Health and Safety briefings held each day

The electronic log may then be delivered regularly to the project team, to maintain open communication between the field program personnel and project team.

FIELD LOGBOOK

The field logbook will also be maintained electronically and will be produced in PDF at the completion of field work. All entries are made electronically, and corrections are made using change tracking modules of the program (WORD or EXCEL). Each page of the logbook will be dated and signed or initialed by the person

completing the log. Partially completed pages will have a line drawn through the unused portion at the end of each day.

The cover of each logbook will be entitled with the facility and project name, the name of the subcontractor or agency completing the logbook, the logbook type (i.e., Site Log or sequentially numbered Field Logbook), and the date the logbook was started. Field logbooks are daily records of field task activities that are entered in real time by the onsite field personnel. The following information will be entered into the field logbooks:

- The date and time of each entry. The daily log should begin with weather conditions and the names and organization of personnel performing the documented task
- Date and signature will be in the same place on each page, either top or bottom
- Documentation of equipment calibration, maintenance, and decontamination activities
- Documentation of the sites where work is being completed
- A summary of important tasks or subtasks completed during the day
- A description of any field tests completed in association with the daily task
- A description of any samples collected including documentation of any quality control samples that were prepared (rinse blanks, duplicates, matrix spikes, split samples)
- The location of where each photo was taken and the direction in which the camera was pointed
- A summary of any problems encountered during the day including a description of corrective actions and potential impacts on the daily task
- Documentation of all visitors to the site and their affiliations
- If notes are taken on loose paper, they must be transcribed as soon as possible into a regular field logbook by the same personnel that wrote the original notes
- Any sketches or diagrams included in the field logbooks should include, at a minimum, north arrow, and a “Not to Scale” note
- FDRs such as soil sample logs will be maintained on a separate form and will not be repeated in the Field Logbook. However, a reference regarding the presence of field activity specific FDRs will be included in the Field Logbook. See Section 2.2 regarding FDRs

SAMPLE COLLECTION AND EXPLORATION RECORDS

Sample collection and exploration records (i.e., FDR) will be completed electronically to document soil collection details. A copy of the field form that will be used is attached to this SOP. An FDR will be completed each time a field sample is collected. Field measurements and observations associated with a sample collection task are to be recorded on the FDR, including, but not limited to, sample collection methods, materials, dates and times, and sample locations and identifiers. FDRs will be maintained throughout the field program in files that become a permanent record of field program activities.

PHOTOGRAPHS

Activities will be documented in the field using photographs, as necessary. The tablets that will be utilized for field activities are equipped with digital cameras and digital photo logs. Photographs provide a visual record of conditions encountered during field investigations and a visual history of the completed activities. The field personnel will be responsible for taking photographs and maintaining a photographic file for the site. The location of where each photo was taken and the direction in which the camera was pointed will be recorded in the logbook and field map so that the logbook description, map location, and photo identification number will match. Photographs will be recorded digitally, and a copy of the digital photographs will be submitted with the report.

ATTACHMENT

A FIELD FORMS

Toxaphene Immunoassay Soil Sample Log Form

						Toxaphene[3]			
Date	Location ID	Sample ID	Arizona Residential Soil Remediation Level[1]			5.0			
			Arizona Non-Residential Soil Remediation Level[2]			16.0			
			Depth (feet)	PID (ppmv)	Soil Description	Concentration (mg/kg)			Comments
Toxaphene						Immunoassay		Laboratory	
						OD[4]	Result		

Toxaphene Immunoassay Soil Sample Log Form

Date	Location ID	Sample ID	Depth (feet)	PID (ppmv)	Soil Description	Toxaphene[3]			Comments
Arizona Residential Soil Remediation Level[1]						5.0			
Arizona Non-Residential Soil Remediation Level[2]						16.0			
						Concentration (mg/kg)			
Toxaphene						Immunoassay		Laboratory	
						OD[4]	Result		

Toxaphene Immunoassay Soil Sample Log Form

Date	Location ID	Sample ID	Arizona Residential Soil Remediation Level[1]			Toxaphene[3]			Comments
			Arizona Non-Residential Soil Remediation Level[2]			5.0			
			Depth (feet)	PID (ppmv)	Soil Description	16.0			
						Concentration (mg/kg)			
Toxaphene						Immunoassay		Laboratory	
						OD[4]	Result		
Immunoassay Calibrator Data - Kit 1							NC		
							2		
							10		

Toxaphene Immunoassay Soil Sample Log Form

						Toxaphene[3]			
			Arizona Residential Soil Remediation Level[1]			5.0			
			Arizona Non-Residential Soil Remediation Level[2]			16.0			
Date	Location ID	Sample ID	Depth (feet)	PID (ppmv)	Soil Description	Concentration (mg/kg)			Comments
Toxaphene						Immunoassay		Laboratory	
						OD[4]	Result		

Toxaphene Immunoassay Soil Sample Log Form

Date	Location ID	Sample ID	Arizona Residential Soil Remediation Level[1]			Toxaphene[3]			Comments
			Arizona Non-Residential Soil Remediation Level[2]			5.0			
						16.0			
			Depth (feet)	PID (ppmv)	Soil Description	Concentration (mg/kg)			
Toxaphene						Immunoassay		Laboratory	
						OD[4]	Result		
Immunoassay Calibrator Data - Kit 2							NC		
							2		
							10		

Toxaphene Immunoassay Soil Sample Log Form

Date	Location ID	Sample ID	Depth (feet)	PID (ppmv)	Soil Description	Concentration (mg/kg)			Comments
						Toxaphene[3]			
		Arizona Residential Soil Remediation Level[1]				5.0			
		Arizona Non-Residential Soil Remediation Level[2]				16.0			
Toxaphene						Immunoassay		Laboratory	
						OD[4]	Result		

Toxaphene Immunoassay Soil Sample Log Form

						Toxaphene[3]			
Date	Location ID	Sample ID	Arizona Residential Soil Remediation Level[1]			5.0			Comments
			Arizona Non-Residential Soil Remediation Level[2]			16.0			
			Depth (feet)	PID (ppmv)	Soil Description	Concentration (mg/kg)			
Toxaphene						Immunoassay		Laboratory	
						OD[4]	Result		
Immunoassay Calibrator Data - Kit 3							NC		
							2		
							10		

Toxaphene Immunoassay Soil Sample Log Form

Date	Location ID	Sample ID				Toxaphene[3]			
			Arizona Residential Soil Remediation Level[1]			5.0			
			Arizona Non-Residential Soil Remediation Level[2]			16.0			
			Depth (feet)	PID (ppmv)	Soil Description	Concentration (mg/kg)			Comments
Toxaphene						Immunoassay		Laboratory	
						OD[4]	Result		

Notes:

1. Arizona 10^{-5} Residential Soil Remediation Level (RSRL)
2. Arizona Non-Residential Soil Remediation Level (NRSRL)
3. Results reported in milligrams per kilogram (mg/kg).
4. Immunoassay sample Optical Density (OD). OD is compared to calibrator data to obtain concentration. NC indicates negative control and NA indicates not analyzed.

Results bolded and shaded indicate concentration exceeds RSRL

Results *bolded* and shaded indicate concentration exceeds NRSRL

APPENDIX

H EN RX TREATABILITY STUDY REPORT

June 21, 2023

Jim Clarke, P.G.
Senior Associate Geologist
WSP USA
4600 E. Washington Street, Suite 600
Phoenix, Arizona
85034

RE: EN Rx Reagent Oxidant Testing for Toxaphene

Greetings Mr. Clarke,

EN Rx, Inc. is pleased to report the following results from our soil Toxaphene bench testing in support of the KK Aerial Applicator Site remedial action plan, in Chandler AZ.

Background

EN Rx, Inc. (EN Rx) was provided with representative shallow soil samples from the KK Aerial Applicator Site in order to perform testing to demonstrate and provide chemical oxidation treatment dosing information for the proposed remedial activities at the site. The soil samples sent to EN Rx were collected from locations known as SB-26 and SB-18. The sample locations are shown on Figure 3 in **Appendix A**. These samples were from two of the most impacted areas of the site. Approximately 20 lbs of soil from each sample location was sent to EN Rx in 5-gallon buckets.

Sample Supply and Bench Goal

The samples were initially tested for laboratory confirmation of the Toxaphene concentrations. These samples were sent to Eurofins Environmental Testing in Altamonte Springs, Florida and collected on October 25, 2023. The analytical laboratory report is included in **Appendix B**. Additional numerous control samples were submitted during different oxidation dosing tests that further confirmed these concentrations. To ensure the homogeneity of the soil, the soils were sieved and then collected and submitted, and the remaining soils sieved out (larger clumps of crushable soils) were ground-up and also submitted to the laboratory. Several of the laboratory

reports were excluded from the appendix due to size and the scope of the project. The known Toxaphene analytical concentration information for these samples is outlined below.

- SB-18
  - Reported to Wood/WSP as 1,100 mg/Kg.
  - Reported by Eurofins laboratory as 360 mg/kg initially.
  - Retested as 370 mg/Kg and crumbled results as 310 mg/Kg.
  - Statistical controls averaged 356 mg/kg, five samples collected October 2022 through January 2023.
- SB-26
  - Reported to Wood/WSP as 260 mg/Kg.
  - Reported by Eurofins laboratory as 64 mg/kg.
  - Retested as 33 mg/Kg and crumbled results as 51 mg/Kg.
  - Statistical controls averaged 49.5 mg/kg, four samples collected October through January 2023.

The intended goal of the treatability bench testing by EN Rx was to reduce these highly impacted samples to below Non-Residential Soil Remediation Level (NRSRL), a target analytical goal of 16 mg/Kg. This is not the intended goal of all the work at the site however, clear reduction to this concentration illustrates the capability of the EN Rx Reagent. Lesser contaminated soils at the site will have similar reduction magnitudes and percentages yielding concentrations below the cleanup goals of 5.0 mg/Kg. Thus, the stated goal is to reduce mass by between approximately 96% (360 to 16) and 65% (50 to 16).

Dosing and Activation

Past experience by EN Rx treating Organic Chlorinated Pesticides (OCPs) including Toxaphene requires more activation energy than when oxidizing fuel and solvent contamination, via EN Rx Activator Synergist-D. The dosing previously was approximately 6-7% by weight compared to oxidant. Also, prior experience indicates that EN Rx SSO performs much better on OCPs than hydrogen peroxide (liquid, 35%) when activated properly. From our experience the reactions did tend to take sufficient ample time, in the months' time frame, to see results.

Treatment dosing generally was lower in past OCP projects, by EN Rx due to lower concentrations of target analytes, DDT, Delrin, etc. Therefore, EN Rx was assumed scaled dosing would be required to provide treatment, however varying amounts of Solid Singlet Oxygen (SSO) oxidant were attempted. We tested eight different dosage designs in our main comparison reactors.

Based on the remedial design at the site, EN Rx desired to speed up the reactions to provide quicker onsite analysis and backfilling of treated soils. EN Rx attempted two methods to achieve higher rates of reaction, more activator and base activation.

We attempted several different bases to activate the oxidant, mainly CaOH and NaOH. We attempted activator concentrations at 2.5%, 5%, 7.5%, 10%, and even 20%.

Most of these sample tests were completed using immunoassay test kit results as these could be rapidly repeated and provide 'real time' information.

Analytical Variability

The observed laboratory analytical variability between samples merits additional discussion. Many of the laboratory reports issued qualifiers for dilution and variability. This was consistent from all three laboratories used for this treatability testing: Eurofins, Advanced Environmental Laboratories, and PACE Laboratory. EN Rx submitted forty-seven (47) different samples attempting to gain an understanding and certainty of the laboratory results. We have focused in on the treatability dosing and provided multiple results for the final dosing for this report. However, it should be noted the result all have some variability due to the nature of the soil and the contaminant concentrations present.

Laboratory Speed

Analytical laboratory data was difficult to acquire test results quickly. There is shipping time associated with the delivery of the collected samples, the amount of time between sample arrival at the laboratory, testing and data reporting was at best 6 days and usually 10-15 days. One set of samples was lost in shipping. Given these laboratory constraints it was difficult to test sample results more than once every week or two. Treatment dosing adjustments often took weeks or up to a month to incorporate the changes. Reductions that take place over 60 days required extended bench testing with the required adjustments.

Laboratory delays and varying laboratory Turn Around Times (TATs), forced EN Rx to change laboratories twice. However, we did notice in general, consistency between laboratories within reason, despite analytical variability.

As noted below, treatment adjustments and state of the art tools were used to work quickly, but the complexity of the soil and the required treatability testing took significant time. The bench testing took almost nine months to complete.

Field Screening Speed and Variability

EN Rx also tested and attempted to use Envirogaurd immunoassay field screening soil test kits to determine reductions and trends present due to different levels of dosing and activation. These kits use immunoassay (enzyme) technology to provide colorimetric data sets. The color can be

interpreted by a spectrometer and therefore quantified and compared. Comparison is made to a chlordane standard and to our control soil sample.

These soil test kits did appear to show positive trends and provide good information at times. The methodology and number of dilutions required us to learn and adapt the general operating procedures for the soil type, concentrations, and usage.

More than 120 screening samples were run to evaluate the dosing and reductions. The soil test kit data was used in conjunction with the analytical data to refine the treatability dosing. The following results provided the information that the base activation method attempted did indeed produce faster reductions.

High pH Run (11+) Data 2 Week Post Treatment										
Sample	**dilution**	**% Red**	**Result (ppm)**	**Color**	**calc**	**Color 20**	**calc**	**Color 100**	**calc**	**Color 600**
Control 101	low (2 g)		36	-0.19		-0.15		-0.06	29	0.14
	high (4 g)			-0.34		-0.31		-0.22	43.6	-0.02
Liq Base 102	low	79%	8	-0.01	0.83	0.03		0.12		0.32
	high			-0.19		-0.15		-0.06	14.5	0.14
2 Bases 103	low	51%	18	-0.12		-0.08	12.6	0.01		0.2
	high			-0.22		-0.18		-0.09	22.8	0.1
Base 104	low	92%	3	-0.03	2.5	0		0.06		0.27
	high			-0.08		-0.04	3.55	0.05		0.25

'Calc' indicates an interpolation between values. All results are not qualitative, but relative.

From this data, it was clear that higher pH runs resulted in some reduction in faster timelines, possibly in the days' range. The concentration of these samples were later confirmed in relative aspect only to the control. For instance, liquid Base 102 reported from the laboratory as 69 mg/Kg and Base 104 reported as 35 mg/Kg, confirming reduction and the relatively of the immunoassay soil test kit results. This did not confirm the concentration interpolated as 8 and 3 mg/Kg, respectively, a magnitude of difference. The Control 101 appeared to be clearly higher. It should be noted these laboratory submittals were the leanest samples collected, most less than 50 g.

Moisture Content

Prior experience and general chemistry indicate that reactions take place in the aqueous phase. Thus, the soil must be moisturized prior to reacting. The soil samples delivered to the EN Rx lab had a very low moisture content (<5%). The soil generally requires 15-20% moisture to allow reaction. Allowing the soil to dry out will stop and possibly neutralize the reaction. We believe a few of our tests were affected negatively due to moisture content. This was another test variable

that was watched closely. During the full-scale treatment onsite, soil moisture monitoring will require constant attention.

Reactor Methodology

EN Rx completed each Toxaphene treatability bench test 'run' based on the following protocol. First, a sample was homogenized and screened (sieved) to exclude rock and roots or debris. This also excluded clumps of soil, although hard soils were often crushed to some degree prior to running it through the sieve. From the sieved soil, the sample was placed into a plastic container to provide easy mixing during the process. The chosen containers also had lids to control moisture. In the smallest runs, plastic bags were used. These containers can be referred to as our reactor(s).

The soils were weighed to determine the appropriate amount of reagent necessary to be applied. Scale accuracy was generally 0.1 g for soil, and 0.01 g for chemicals. In general, reactor sizes were based on the intended number of samples to be collected. For instance, a 'run' that would require five -100 g samples to be collected would have to start at a minimum of 500 g of soil. Sample sizes varied between 50-200 g, and in some instances, samples were split to allow and extra sample to be collected. Analytical laboratories typically request larger samples sizes due to protocols and analytical reruns, but the labs were generally able to provide results for all samples submitted.

After weighing each reactor, the treatability dosing was completed. We generally added the base first, SSO second, and the activator last. In some cases, we added each of these as wet and premixed, and in other instances as dry granules. In all cases the activator provided most of the moisture content as diluted with water, but at the end of the chemical additions, water was added to the soil to match moisture content across reactors in a run group (series).

For instance, our final treatability dosing consisted of the following. A 200 g sample was sieved and put into a plastic container. Then 2.8 grams of dry NaOH (lye) was added to the soil. Then 1.05 g of dry SSO was added to the soil. Then activator was mixed into distilled water, approximately 0.07 g of Synergist-D (proprietary catalyst-activator) was added. Lastly, 50 grams of water was used to dilute the activator. The sample was mixed with a wood stirrer (disposable tongue depressor). An additional 11 grams of water was added at the end to bring the soil to a wet state. The sample was covered and allowed to react, but the lid was not sealed tight to ensure the lid would not pop off from pressure build-up. The soil was monitored each day to ensure it was not drying out. Two samples were collected (100 grams each) and submitted to a laboratory for analysis.

[Note: Laboratories report results based on dry weight so water addition and evaporation should not have had analytical effects beyond the ability to keep reactors wet/moist.]

Control runs were dosed with water and mixed the same to ensure the reductions were from the chemical reactions and not the process.

Samples were collected and shipped overnight to each lab. No ice was used as the samples had been reacting for weeks, so there was no need to reduce or halt the reaction as additional reduction during transit would be included and negligible. The lab receipt time can be considered the time the sample stopped reaction as it was refrigerated.

Toxaphene treatability bench test runs were grouped in series. A summary of the Toxaphene treatability bench test runs is provided in **Table 1**. Preliminary results are omitted to focus the reporting on the end results and not the dosing and poor runs that did not provide adequate success. This table illustrates the extensive amount of time and effort that went into the Toxaphene treatability bench test.

Table 1
Toxaphene Treatability Bench Test Run Series Completed

Series	Dosing Attempt	Number of Reactors
000	Initial Lean Dosing Low Activation	12
050	Initial High Strength Dosing High Act (HR series)	4
100	Base Doses to achieve pH + Screening, SB-26	6
200	SSA larger for Lab	2
300	Base + Screening as series 100, SB-18	6
400	300 with oxidant doses on set base quantities, SB-18	5
500	Bioassay final runs, base activation (small)	12
600	SB-18 Lab size Finals, double activated	2
700	SB-18 Lab size Finals, Trip activated	5
800	Final no base trip activated	5

Treatability Dosing Results

EN Rx utilized most of the available variable combinations of oxidant load, activation level, and pH level for the soil samples received. Below is what we can report as a general understanding.

From the different Toxaphene treatability bench test run series, the following is apparent.

- Ample oxidant is required for reduction. We recommend highly impacted soils utilize 0.5% by

weight SSO. Lower impacted soils can utilize a proportionally lower dose. Higher dose concentrations does not appear to provide added benefit (more reduction). Series 400 (405).

- Synergist-D activation of approximately 7% by weight oxidant is required for reduction.
- Base activation speeds up the reaction rates possibly inside a weeks' time. Two-week results indicate >90% reductions. However, Synergist counteracts this to varying degrees as it is an acid and is added in an amount based on oxidant load.
- Moisture is required at more than 17% by weight. The soil is wet.

Based on the results, the final Toxaphene treatability bench test run is the most important to detail the results and elaborate on. It was run on the SB-18 sample, the most impacted sample (area) reported from the site.

The final base run laboratory analytical data is included in **Appendix C.** It included a final control to ensure the control had not changed by an order of magnitude. The higher SSO load runs are from the 400 series (405). This laboratory report is included as **Appendix D.** The longer reaction from synergist only activation is HR2 from the 050 series. The HR2 laboratory results are included in **Appendix E.** Final results are summarized on **Table 2** below.

Table 2
Summary of Final Toxaphene Treatability Bench Test Runs

Series	Dosing	Toxaphene (mg/Kg)	% Red
Final Control - 706	None (SB-18)	153	NA
0.5% SSO Dose - 704	0.5% SSO, 8% Synergist, 1.5% NaOH	14.6*	90-96%
High SSO Dose - 405	6% SSO, 8% Synergist, 1.5% NaOH	16.7	89-95%
No Base - HR2 (052)	1% SSO, 10% Syn-d No Base	17 mg/Kg	96%

% Red (Percent Reduction) Based on both the control during series or the known control for initial sample.
*A duplicate for this sample was 6.9

From these results it is clearly illustrated that soil with significant amount of toxaphene can be reduced to low levels (90%+ reduction) using both base activation and Synergist-D only activation of SSO.

For base activation a significant amount of base is required. This is both costly and requires additional safety measures. For this reason, we do not recommend sodium hydroxide activation unless treatment speed is absolutely required. We believe this is necessary with the higher concentrations greater than 200 mg/Kg. This occurs only at the SB-18, SB-2 and SB-26 cells, and possibly one cell in the landfill excavation area. Over the remainder of the site a lower SSO and Synergist-D activated treatment dosage is merited.

Conclusions

After 59 Toxaphene treatability bench test runs and numerous sets of laboratory analytical data, as well as over 120 immunoassay samples, ample bench test data suggests final reductions are significant and above 90% for the most impacted soil samples at the site and achieve lower concentration below 15 mg/Kg within two to eight weeks of treatment / reaction time.

This information can be used to refine the remedial action plan.

Thank you for the opportunity to complete this Toxaphene treatability bench testing and work with you on the KK Aerial Applicator Site. Please let us know if there are any questions.

Sincerely,
The EN Rx Team

Lance I. Robinson

President

EN Rx, Inc.

Appendix A

Legend

- Project Limits
- Soil Boring Location
- Test Pit Location
- Decision Unit
- Landfill Boundary

Toxaphene Concentration

- 5.0 mg/kg (RSRL) *322,743.73 sqft*
- 16.0 mg/kg (NRSRL) *171,345.97 sqft*

Aerials2022

Notes:

SB-19	Soil Boring Identification
2.8 – 16.8	Toxaphene immunoassay result in mg/kg
4.7	Toxaphene laboratory result in mg/kg (if applicable)
	Bold results exceed RSRL (5.0 mg/kg)
	Bold and Italic results exceed NRSRL (16.0 mg/kg)
TP-1	Test Pit Identification
mg/kg	milligrams per kilogram
Sqft	Square feet
RSRL	Arizona Residential Soil Remediation Level
NRSRL	Arizona Non-Residential Soil Remediation Level

Aerial Imagery: Maricopa County Assessor 2022

0 125 250 Feet

N

City of Chandler Municipal Airport
K & K Aerial Applicator Site
Chandler, Arizona

Figure **3**

Extent of Toxaphene Contamination in Soil

Job No.	1420212046
PM:	JNC
Date:	10/12/2022
Scale:	1"= 125 feet

Appendix B

eurofins | Environment Testing

ANALYTICAL REPORT

Eurofins Houston
4145 Greenbriar Dr
Stafford, TX 77477
Tel: (281)240-4200

Laboratory Job ID: 860-35921-1
Client Project/Site: GWs & SSs

For:
ENRX, Inc.
PO BOX 27056
Flower Mound, Texas 75027

Attn: Eric Arenberg

Authorized for release by:
11/9/2022 6:26:12 PM

David Camacho, Manager of Project Management
(407)339-5984
david.camacho@et.eurofinsus.com

Table of Contents

Definitions/Glossary

Client: ENRX, Inc.
Job ID: 860-35921-1
Project/Site: GWs & SSs

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
J1	Estimated value; value may not be accurate. Surrogate recovery outside of criteria.
U	Indicates that the compound was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ENRX, Inc.
Project/Site: GWs & SSs

Job ID: 860-35921-1

Job ID: 860-35921-1

Laboratory: Eurofins Houston

Narrative

Job Narrative
860-35921-1

Receipt
The samples were received on 10/28/2022 10:31 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 23.8°C

Pesticides
Method 8081B: The following samples required a dilution due to the nature of the sample matrix: CL (860-35921-1), R3 (860-35921-5), R4 (860-35921-6), R5 (860-35921-7) and R6 (860-35921-8). Because of this dilution, the surrogate spike concentration in the sample was reduced to a level where the recovery calculation does not provide useful information.

Method 8081B: The following samples were diluted due to the nature of the sample matrix: CL (860-35921-1), R3 (860-35921-5), R4 (860-35921-6), R5 (860-35921-7) and R6 (860-35921-8). Elevated reporting limits (RLs) are provided.

Method 8081B: The following samples required a dilution due to the nature of the sample matrix: CH (860-35921-2), R1 (860-35921-3) and R2 (860-35921-4). Because of this dilution, the surrogate spike concentration in the sample was reduced to a level where the recovery calculation does not provide useful information.

Method 8081B: The following sample required a dilution due to the nature of the sample matrix: CL (860-35921-1). Because of this dilution, the surrogate spike concentration in the sample was reduced to a level where the recovery calculation does not provide useful information.

Method 8081B: The following samples were diluted due to the nature of the sample matrix: CH (860-35921-2), R1 (860-35921-3) and R2 (860-35921-4). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
Method Moisture: The sample duplicate (DUP) precision for analytical batch 860-75660 was outside control limits. Sample non-homogeneity is suspected.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Detection Summary

Client: ENRX, Inc.
Project/Site: GWs & SSs

Job ID: 860-35921-1

Client Sample ID: CL — Lab Sample ID: 860-35921-1

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Toxaphene	64		4.0	2.7	mg/Kg	200	☼	8081B	Total/NA

Client Sample ID: CH — Lab Sample ID: 860-35921-2

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Toxaphene - DL	360		3.9	2.7	mg/Kg	200	☼	8081B	Total/NA

Client Sample ID: R1 — Lab Sample ID: 860-35921-3

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Toxaphene - DL	260		3.9	2.7	mg/Kg	200	☼	8081B	Total/NA

Client Sample ID: R2 — Lab Sample ID: 860-35921-4

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Toxaphene - DL2	350		7.9	5.4	mg/Kg	400	☼	8081B	Total/NA

Client Sample ID: R3 — Lab Sample ID: 860-35921-5

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Toxaphene	330		4.0	2.7	mg/Kg	200	☼	8081B	Total/NA

Client Sample ID: R4 — Lab Sample ID: 860-35921-6

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Toxaphene	290		3.9	2.7	mg/Kg	200	☼	8081B	Total/NA

Client Sample ID: R5 — Lab Sample ID: 860-35921-7

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Toxaphene	35		4.2	2.8	mg/Kg	200	☼	8081B	Total/NA

Client Sample ID: R6 — Lab Sample ID: 860-35921-8

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Toxaphene	43		4.0	2.7	mg/Kg	200	☼	8081B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: CL

Lab Sample ID: 860-35921-1
Date Collected: 10/25/22 14:00
Matrix: Solid
Date Received: 10/28/22 10:31
Percent Solids: 82.6

Method: SW846 8081B - Organochlorine Pesticides (GC)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toxaphene	64		4.0	2.7	mg/Kg	☼	10/29/22 08:01	11/07/22 14:39	200

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*93*		*35 - 135*	*10/29/22 08:01*	*11/07/22 14:39*	*200*
Tetrachloro-m-xylene	*126*		*35 - 135*	*10/29/22 08:01*	*11/08/22 22:08*	*200*
DCB Decachlorobiphenyl (Surr)	*0*	*J1*	*25 - 143*	*10/29/22 08:01*	*11/07/22 14:39*	*200*
DCB Decachlorobiphenyl (Surr)	*155*	*J1*	*25 - 143*	*10/29/22 08:01*	*11/08/22 22:08*	*200*

Client Sample ID: CH

Lab Sample ID: 860-35921-2
Date Collected: 10/25/22 14:03
Matrix: Solid
Date Received: 10/28/22 10:31
Percent Solids: 84.5

Method: SW846 8081B - Organochlorine Pesticides (GC) - DL

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toxaphene	360		3.9	2.7	mg/Kg	☼	10/29/22 08:01	11/08/22 10:37	200

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*148*	*J1*	*35 - 135*	*10/29/22 08:01*	*11/08/22 10:37*	*200*
DCB Decachlorobiphenyl (Surr)	*0*	*J1*	*25 - 143*	*10/29/22 08:01*	*11/08/22 10:37*	*200*

Method: SW846 8081B - Organochlorine Pesticides (GC) - DL2

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*173*	*J1*	*35 - 135*	*10/29/22 08:01*	*11/08/22 18:59*	*400*
DCB Decachlorobiphenyl (Surr)	*0*	*J1*	*25 - 143*	*10/29/22 08:01*	*11/08/22 18:59*	*400*

Client Sample ID: R1

Lab Sample ID: 860-35921-3
Date Collected: 10/25/22 14:05
Matrix: Solid
Date Received: 10/28/22 10:31
Percent Solids: 84.8

Method: SW846 8081B - Organochlorine Pesticides (GC) - DL

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toxaphene	260		3.9	2.7	mg/Kg	☼	10/29/22 08:01	11/08/22 10:50	200

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*128*		*35 - 135*	*10/29/22 08:01*	*11/08/22 10:50*	*200*
DCB Decachlorobiphenyl (Surr)	*0*	*J1*	*25 - 143*	*10/29/22 08:01*	*11/08/22 10:50*	*200*

Client Sample ID: R2

Lab Sample ID: 860-35921-4
Date Collected: 10/25/22 14:08
Matrix: Solid
Date Received: 10/28/22 10:31
Percent Solids: 84.6

Method: SW846 8081B - Organochlorine Pesticides (GC) - DL

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*157*	*J1*	*35 - 135*	*10/29/22 08:01*	*11/08/22 11:04*	*200*
DCB Decachlorobiphenyl (Surr)	*0*	*J1*	*25 - 143*	*10/29/22 08:01*	*11/08/22 11:04*	*200*

Method: SW846 8081B - Organochlorine Pesticides (GC) - DL2

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toxaphene	350		7.9	5.4	mg/Kg	☼	10/29/22 08:01	11/08/22 19:13	400

Client Sample ID: R2
Lab Sample ID: 860-35921-4
Date Collected: 10/25/22 14:08
Matrix: Solid
Date Received: 10/28/22 10:31
Percent Solids: 84.6

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Tetrachloro-m-xylene	178	J1	35 - 135	10/29/22 08:01	11/08/22 19:13	400
DCB Decachlorobiphenyl (Surr)	0	J1	25 - 143	10/29/22 08:01	11/08/22 19:13	400

Client Sample ID: R3
Lab Sample ID: 860-35921-5
Date Collected: 10/25/22 14:12
Matrix: Solid
Date Received: 10/28/22 10:31
Percent Solids: 84.3

Method: SW846 8081B - Organochlorine Pesticides (GC)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toxaphene	330		4.0	2.7	mg/Kg	☼	10/29/22 08:01	11/07/22 13:08	200

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Tetrachloro-m-xylene	63		35 - 135	10/29/22 08:01	11/07/22 13:08	200
DCB Decachlorobiphenyl (Surr)	97		25 - 143	10/29/22 08:01	11/07/22 13:08	200

Client Sample ID: R4
Lab Sample ID: 860-35921-6
Date Collected: 10/25/22 14:17
Matrix: Solid
Date Received: 10/28/22 10:31
Percent Solids: 84.7

Method: SW846 8081B - Organochlorine Pesticides (GC)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toxaphene	290		3.9	2.7	mg/Kg	☼	10/29/22 08:01	11/07/22 13:22	200

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Tetrachloro-m-xylene	115		35 - 135	10/29/22 08:01	11/07/22 13:22	200
DCB Decachlorobiphenyl (Surr)	0	J1	25 - 143	10/29/22 08:01	11/07/22 13:22	200

Client Sample ID: R5
Lab Sample ID: 860-35921-7
Date Collected: 10/25/22 14:20
Matrix: Solid
Date Received: 10/28/22 10:31
Percent Solids: 80.0

Method: SW846 8081B - Organochlorine Pesticides (GC)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toxaphene	35		4.2	2.8	mg/Kg	☼	10/29/22 08:01	11/07/22 15:34	200

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Tetrachloro-m-xylene	83		35 - 135	10/29/22 08:01	11/07/22 15:34	200
DCB Decachlorobiphenyl (Surr)	0	J1	25 - 143	10/29/22 08:01	11/07/22 15:34	200

Client Sample ID: R6
Lab Sample ID: 860-35921-8
Date Collected: 10/25/22 14:25
Matrix: Solid
Date Received: 10/28/22 10:31
Percent Solids: 82.9

Method: SW846 8081B - Organochlorine Pesticides (GC)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toxaphene	43		4.0	2.7	mg/Kg	☼	10/29/22 08:01	11/07/22 15:48	200

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Tetrachloro-m-xylene	89		35 - 135	10/29/22 08:01	11/07/22 15:48	200
DCB Decachlorobiphenyl (Surr)	0	J1	25 - 143	10/29/22 08:01	11/07/22 15:48	200

Surrogate Summary

Client: ENRX, Inc.
Project/Site: GWs & SSs

Job ID: 860-35921-1

Method: 8081B - Organochlorine Pesticides (GC)

Matrix: Solid

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)											
		TCX1	DCB1										
Lab Sample ID	Client Sample ID	(35-135)	(25-143)										
860-35921-1	CL	93	0 J1										
860-35921-1	CL	126	155 J1										
860-35921-2 - DL	CH	148 J1	0 J1										
860-35921-2 - DL2	CH	173 J1	0 J1										
860-35921-3 - DL	R1	128	0 J1										
860-35921-4 - DL	R2	157 J1	0 J1										
860-35921-4 - DL2	R2	178 J1	0 J1										
860-35921-5	R3	63	97										
860-35921-6	R4	115	0 J1										
860-35921-7	R5	83	0 J1										
860-35921-8	R6	89	0 J1										
LCS 860-75330/2-A	Lab Control Sample	92	105										
LCSD 860-75330/3-A	Lab Control Sample Dup	97	126										
MB 860-75330/1-A	Method Blank	103	123										

Surrogate Legend

TCX = Tetrachloro-m-xylene

DCB = DCB Decachlorobiphenyl (Surr)

Method: 8081B - Organochlorine Pesticides (GC)

Lab Sample ID: MB 860-75330/1-A
Matrix: Solid
Analysis Batch: 75804

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 75330

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toxaphene	0.011	U	0.017	0.011	mg/Kg		10/29/22 08:01	11/02/22 18:52	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*103*		*35 - 135*	*10/29/22 08:01*	*11/02/22 18:52*	*1*
DCB Decachlorobiphenyl (Surr)	*123*		*25 - 143*	*10/29/22 08:01*	*11/02/22 18:52*	*1*

Lab Sample ID: LCS 860-75330/2-A
Matrix: Solid
Analysis Batch: 75804

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 75330

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
4,4'-DDD	0.0167	0.0169		mg/Kg		101	20 - 164
4,4'-DDE	0.0167	0.0175		mg/Kg		105	29 - 157
4,4'-DDT	0.0167	0.0201		mg/Kg		121	13 - 192
Aldrin	0.0167	0.0165		mg/Kg		99	30 - 152
alpha-BHC	0.0167	0.0157		mg/Kg		94	29 - 160
alpha-Chlordane	0.0167	0.0173		mg/Kg		104	30 - 154
beta-BHC	0.0167	0.0151		mg/Kg		91	30 - 155
delta-BHC	0.0167	0.0158		mg/Kg		95	20 - 161
Dieldrin	0.0167	0.0184		mg/Kg		111	33 - 153
Endosulfan I	0.0167	0.0177		mg/Kg		106	30 - 151
Endosulfan II	0.0167	0.0188		mg/Kg		113	27 - 153
Endosulfan sulfate	0.0167	0.0187		mg/Kg		112	15 - 170
Endrin	0.0167	0.0239		mg/Kg		143	25 - 162
Endrin aldehyde	0.0167	0.0146		mg/Kg		87	49 - 117
Endrin ketone	0.0167	0.0189		mg/Kg		113	15 - 168
gamma-BHC (Lindane)	0.0167	0.0159		mg/Kg		96	30 - 158
gamma-Chlordane	0.0167	0.0171		mg/Kg		103	30 - 154
Heptachlor	0.0167	0.0162		mg/Kg		97	29 - 163
Heptachlor epoxide	0.0167	0.0173		mg/Kg		104	30 - 150
Methoxychlor	0.0167	0.0209		mg/Kg		125	33 - 174

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Tetrachloro-m-xylene	*92*		*35 - 135*
DCB Decachlorobiphenyl (Surr)	*105*		*25 - 143*

Lab Sample ID: LCSD 860-75330/3-A
Matrix: Solid
Analysis Batch: 75804

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 75330

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
4,4'-DDD	0.0167	0.0189		mg/Kg		113	20 - 164	11	25
4,4'-DDE	0.0167	0.0197		mg/Kg		118	29 - 157	12	25
4,4'-DDT	0.0167	0.0228		mg/Kg		137	13 - 192	12	25
Aldrin	0.0167	0.0182		mg/Kg		109	30 - 152	9	25
alpha-BHC	0.0167	0.0171		mg/Kg		103	29 - 160	8	25
alpha-Chlordane	0.0167	0.0193		mg/Kg		116	30 - 154	11	25
beta-BHC	0.0167	0.0166		mg/Kg		100	30 - 155	10	25

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: LCSD 860-75330/3-A
Matrix: Solid
Analysis Batch: 75804

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 75330

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
delta-BHC			0.0167	0.0176		mg/Kg		106	20 - 161	10	25
Dieldrin			0.0167	0.0204		mg/Kg		123	33 - 153	10	25
Endosulfan I			0.0167	0.0196		mg/Kg		117	30 - 151	10	25
Endosulfan II			0.0167	0.0210		mg/Kg		126	27 - 153	11	25
Endosulfan sulfate			0.0167	0.0208		mg/Kg		125	15 - 170	11	25
Endrin			0.0167	0.0265		mg/Kg		159	25 - 162	10	25
Endrin aldehyde			0.0167	0.0158		mg/Kg		95	49 - 117	8	25
Endrin ketone			0.0167	0.0212		mg/Kg		127	15 - 168	12	25
gamma-BHC (Lindane)			0.0167	0.0174		mg/Kg		104	30 - 158	9	25
gamma-Chlordane			0.0167	0.0191		mg/Kg		114	30 - 154	11	25
Heptachlor			0.0167	0.0177		mg/Kg		106	29 - 163	9	25
Heptachlor epoxide			0.0167	0.0190		mg/Kg		114	30 - 150	10	25
Methoxychlor			0.0167	0.0233		mg/Kg		140	33 - 174	11	25

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Tetrachloro-m-xylene	*97*		*35 - 135*
DCB Decachlorobiphenyl (Surr)	*126*		*25 - 143*

GC Semi VOA

Prep Batch: 75330

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
860-35921-1	CL	Total/NA	Solid	3550C	
860-35921-2 - DL2	CH	Total/NA	Solid	3550C	
860-35921-2 - DL	CH	Total/NA	Solid	3550C	
860-35921-3 - DL	R1	Total/NA	Solid	3550C	
860-35921-4 - DL	R2	Total/NA	Solid	3550C	
860-35921-4 - DL2	R2	Total/NA	Solid	3550C	
860-35921-5	R3	Total/NA	Solid	3550C	
860-35921-6	R4	Total/NA	Solid	3550C	
860-35921-7	R5	Total/NA	Solid	3550C	
860-35921-8	R6	Total/NA	Solid	3550C	
MB 860-75330/1-A	Method Blank	Total/NA	Solid	3550C	
LCS 860-75330/2-A	Lab Control Sample	Total/NA	Solid	3550C	
LCSD 860-75330/3-A	Lab Control Sample Dup	Total/NA	Solid	3550C	

Analysis Batch: 75804

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 860-75330/1-A	Method Blank	Total/NA	Solid	8081B	75330
LCS 860-75330/2-A	Lab Control Sample	Total/NA	Solid	8081B	75330
LCSD 860-75330/3-A	Lab Control Sample Dup	Total/NA	Solid	8081B	75330

Analysis Batch: 76455

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
860-35921-1	CL	Total/NA	Solid	8081B	75330
860-35921-5	R3	Total/NA	Solid	8081B	75330
860-35921-6	R4	Total/NA	Solid	8081B	75330
860-35921-7	R5	Total/NA	Solid	8081B	75330
860-35921-8	R6	Total/NA	Solid	8081B	75330

Analysis Batch: 76650

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
860-35921-2 - DL	CH	Total/NA	Solid	8081B	75330
860-35921-2 - DL2	CH	Total/NA	Solid	8081B	75330
860-35921-3 - DL	R1	Total/NA	Solid	8081B	75330
860-35921-4 - DL	R2	Total/NA	Solid	8081B	75330
860-35921-4 - DL2	R2	Total/NA	Solid	8081B	75330

Analysis Batch: 76694

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
860-35921-1	CL	Total/NA	Solid	8081B	75330

General Chemistry

Analysis Batch: 75660

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
860-35921-1	CL	Total/NA	Solid	Moisture	
860-35921-2	CH	Total/NA	Solid	Moisture	
860-35921-3	R1	Total/NA	Solid	Moisture	
860-35921-4	R2	Total/NA	Solid	Moisture	
860-35921-5	R3	Total/NA	Solid	Moisture	
860-35921-6	R4	Total/NA	Solid	Moisture	
860-35921-7	R5	Total/NA	Solid	Moisture	

General Chemistry (Continued)

Analysis Batch: 75660 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
860-35921-8	R6	Total/NA	Solid	Moisture	
MB 860-75660/1	Method Blank	Total/NA	Solid	Moisture	
840-1514-A-1 DU	Duplicate	Total/NA	Solid	Moisture	

Lab Chronicle

Client: ENRX, Inc.
Project/Site: GWs & SSs

Job ID: 860-35921-1

Client Sample ID: CL
Lab Sample ID: 860-35921-1
Date Collected: 10/25/22 14:00
Matrix: Solid
Date Received: 10/28/22 10:31

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			75660	10/31/22 15:14	JM	EET HOU

Client Sample ID: CL
Lab Sample ID: 860-35921-1
Date Collected: 10/25/22 14:00
Matrix: Solid
Date Received: 10/28/22 10:31
Percent Solids: 82.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3550C			29.96 g	5.0 mL	75330	10/29/22 08:01	BH	EET HOU
Total/NA	Analysis	8081B		200	1 mL	1 mL	76455	11/07/22 14:39	WP	EET HOU
Total/NA	Prep	3550C			29.96 g	5.0 mL	75330	10/29/22 08:01	BH	EET HOU
Total/NA	Analysis	8081B		200			76694	11/08/22 22:08	JAL	EET HOU

Client Sample ID: CH
Lab Sample ID: 860-35921-2
Date Collected: 10/25/22 14:03
Matrix: Solid
Date Received: 10/28/22 10:31

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			75660	10/31/22 15:14	JM	EET HOU

Client Sample ID: CH
Lab Sample ID: 860-35921-2
Date Collected: 10/25/22 14:03
Matrix: Solid
Date Received: 10/28/22 10:31
Percent Solids: 84.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3550C	DL		30.03 g	5.0 mL	75330	10/29/22 08:01	BH	EET HOU
Total/NA	Analysis	8081B	DL	200	1 mL	1 mL	76650	11/08/22 10:37	JAL	EET HOU
Total/NA	Prep	3550C	DL2		30.03 g	5.0 mL	75330	10/29/22 08:01	BH	EET HOU
Total/NA	Analysis	8081B	DL2	400	1 mL	1 mL	76650	11/08/22 18:59	JAL	EET HOU

Client Sample ID: R1
Lab Sample ID: 860-35921-3
Date Collected: 10/25/22 14:05
Matrix: Solid
Date Received: 10/28/22 10:31

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			75660	10/31/22 15:14	JM	EET HOU

Client Sample ID: R1
Lab Sample ID: 860-35921-3
Date Collected: 10/25/22 14:05
Matrix: Solid
Date Received: 10/28/22 10:31
Percent Solids: 84.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3550C	DL		30.01 g	5.0 mL	75330	10/29/22 08:01	BH	EET HOU
Total/NA	Analysis	8081B	DL	200	1 mL	1 mL	76650	11/08/22 10:50	JAL	EET HOU

Lab Chronicle

Client: ENRX, Inc.
Project/Site: GWs & SSs

Job ID: 860-35921-1

Client Sample ID: R2
Lab Sample ID: 860-35921-4
Date Collected: 10/25/22 14:08
Matrix: Solid
Date Received: 10/28/22 10:31

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			75660	10/31/22 15:14	JM	EET HOU

Client Sample ID: R2
Lab Sample ID: 860-35921-4
Date Collected: 10/25/22 14:08
Matrix: Solid
Date Received: 10/28/22 10:31
Percent Solids: 84.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3550C	DL		30.00 g	5.0 mL	75330	10/29/22 08:01	BH	EET HOU
Total/NA	Analysis	8081B	DL	200	1 mL	1 mL	76650	11/08/22 11:04	JAL	EET HOU
Total/NA	Prep	3550C	DL2		30.00 g	5.0 mL	75330	10/29/22 08:01	BH	EET HOU
Total/NA	Analysis	8081B	DL2	400	1 mL	1 mL	76650	11/08/22 19:13	JAL	EET HOU

Client Sample ID: R3
Lab Sample ID: 860-35921-5
Date Collected: 10/25/22 14:12
Matrix: Solid
Date Received: 10/28/22 10:31

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			75660	10/31/22 15:14	JM	EET HOU

Client Sample ID: R3
Lab Sample ID: 860-35921-5
Date Collected: 10/25/22 14:12
Matrix: Solid
Date Received: 10/28/22 10:31
Percent Solids: 84.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3550C			29.97 g	5.0 mL	75330	10/29/22 08:01	BH	EET HOU
Total/NA	Analysis	8081B		200	1 mL	1 mL	76455	11/07/22 13:08	WP	EET HOU

Client Sample ID: R4
Lab Sample ID: 860-35921-6
Date Collected: 10/25/22 14:17
Matrix: Solid
Date Received: 10/28/22 10:31

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			75660	10/31/22 15:14	JM	EET HOU

Client Sample ID: R4
Lab Sample ID: 860-35921-6
Date Collected: 10/25/22 14:17
Matrix: Solid
Date Received: 10/28/22 10:31
Percent Solids: 84.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3550C			29.98 g	5.0 mL	75330	10/29/22 08:01	BH	EET HOU
Total/NA	Analysis	8081B		200	1 mL	1 mL	76455	11/07/22 13:22	WP	EET HOU

Lab Chronicle

Client: ENRX, Inc.
Project/Site: GWs & SSs

Job ID: 860-35921-1

Client Sample ID: R5
Lab Sample ID: 860-35921-7
Date Collected: 10/25/22 14:20
Matrix: Solid
Date Received: 10/28/22 10:31

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			75660	10/31/22 15:14	JM	EET HOU

Client Sample ID: R5
Lab Sample ID: 860-35921-7
Date Collected: 10/25/22 14:20
Matrix: Solid
Date Received: 10/28/22 10:31
Percent Solids: 80.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3550C			30.02 g	5.0 mL	75330	10/29/22 08:01	BH	EET HOU
Total/NA	Analysis	8081B		200	1 mL	1 mL	76455	11/07/22 15:34	WP	EET HOU

Client Sample ID: R6
Lab Sample ID: 860-35921-8
Date Collected: 10/25/22 14:25
Matrix: Solid
Date Received: 10/28/22 10:31

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			75660	10/31/22 15:14	JM	EET HOU

Client Sample ID: R6
Lab Sample ID: 860-35921-8
Date Collected: 10/25/22 14:25
Matrix: Solid
Date Received: 10/28/22 10:31
Percent Solids: 82.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3550C			30.05 g	5.0 mL	75330	10/29/22 08:01	BH	EET HOU
Total/NA	Analysis	8081B		200	1 mL	1 mL	76455	11/07/22 15:48	WP	EET HOU

Laboratory References:

EET HOU = Eurofins Houston, 4145 Greenbriar Dr, Stafford, TX 77477, TEL (281)240-4200

Accreditation/Certification Summary

Client: ENRX, Inc.
Job ID: 860-35921-1
Project/Site: GWs & SSs

Laboratory: Eurofins Houston

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Arkansas DEQ	State	88-00759	08-04-23
Florida	NELAP	E871002	06-30-23
Louisiana (All)	NELAP	03054	06-30-23
Oklahoma	State	1306	08-31-23
Texas	NELAP	T104704215-22-47	06-30-23
Texas	TCEQ Water Supply	T104704215	12-31-22
USDA	US Federal Programs	P330-22-00025	03-02-23

Method Summary

Client: ENRX, Inc.
Job ID: 860-35921-1
Project/Site: GWs & SSs

Method	Method Description	Protocol	Laboratory
8081B	Organochlorine Pesticides (GC)	SW846	EET HOU
Moisture	Percent Moisture	EPA	EET HOU
3550C	Ultrasonic Extraction	SW846	EET HOU

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET HOU = Eurofins Houston, 4145 Greenbriar Dr, Stafford, TX 77477, TEL (281)240-4200

Sample Summary

Client: ENRX, Inc.
Project/Site: GWs & SSs

Job ID: 860-35921-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
860-35921-1	CL	Solid	10/25/22 14:00	10/28/22 10:31
860-35921-2	CH	Solid	10/25/22 14:03	10/28/22 10:31
860-35921-3	R1	Solid	10/25/22 14:05	10/28/22 10:31
860-35921-4	R2	Solid	10/25/22 14:08	10/28/22 10:31
860-35921-5	R3	Solid	10/25/22 14:12	10/28/22 10:31
860-35921-6	R4	Solid	10/25/22 14:17	10/28/22 10:31
860-35921-7	R5	Solid	10/25/22 14:20	10/28/22 10:31
860-35921-8	R6	Solid	10/25/22 14:25	10/28/22 10:31

860-35921 Chain of Custody

ENVIRONMENTAL CONSERVATION LABORATORIES CHAIN-OF-CUSTODY RECORD

ENCO
10775 Central Port Dr, Orlando, FL 32824, (407) 826-5314 Fax (407) 850-6945
4810 Executive Park Court, Suite 111, Jacksonville, FL 32216-6069, (904) 296-3007 Fax (904) 296-6210
102-A Woodwinds Industrial Court, Cary, NC 27511, (919) 467-3090 Fax (919) 467-3515

Page 1 of 1

Client Name: ENRx Inc (ENOTS)	Project Number:
Address: PO Box 270586	Project Name/Desc: Soils
City/ST/Zip: Flower Mound, TX 75027	PO # / Billing Info:
Tel: (832)250-1700 Fax:	Reporting Contact: Lance Robinson
Sampler(s) Name, Affiliation (Print): Derrick Drake	Billing Contact:
Sampler(s) Signature:	Facility # (if required):

Requested Analyses: 8081b (Texas Pkg)

Requested Turnaround Times
Note: Rush requests subject to acceptance by the facility
✓ Standard
__ Expedited
Due __/__/__
Lab Workorder: AF06884

Item #	Sample ID (Field Identification)	Collection Date	Collection Time	Comp / Grab	Matrix (see codes)	Total # of Containers	Preservation (See Codes) (Combine as necessary)	Sample Comments
	CL	10/25/22	1400	GR	SO	1	X	
	CH	"	1403	"	"	1	X	
	R1	"	1405	"	"	1	X	
	R2	"	1408	"	"	1	X	
	R3	"	1412	"	"	1	X	
	R4	"	1417	"	"	1	X	
	R5	"	1420	"	"	1	X	
	R6	"	1425	"	"	1	X	
						8	<- Total # of Containers	

Sample Kit Prepared By	Date/Time		Date/Time	Received By		Date/Time	
Comments		FedEx	10/25/22 1500	Received By	FedEx	Date/Time	
			Date/Time	Received By	PLPL	10/28 (03)	
			Date/Time	Received By		Date/Time	

Cooler #'s & Temps on Receipt | Condition Upon Receipt: __ Acceptable __ Unacceptable

Matrix: GW-Groundwater SO-Soil SE-Sediment SW-Surface Water WW-Wastewater A-Air O-Other (detail in comments)
Preservation: I-Ice H-HCl N-HNO3 S-H2SO4 NO-NaOH O-Other (detail in comments)

Note: All samples submitted to ENCO Labs are in accordance with the terms and conditions listed on the reverse of this form, unless prior written agreements exist

Temp: 23.5 IR ID.HOU-343
C/F +0.3
Corrected Temp. 23.8

Login Sample Receipt Checklist

Client: ENRX, Inc.

Job Number: 860-35921-1

Login Number: 35921
List Number: 1
Creator: Palmar, Pedro

List Source: Eurofins Houston

Question	Answer	Comment
The cooler's custody seal, if present, is intact.		
Sample custody seals, if present, are intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the containers received and the COC.		
Samples are received within Holding Time (excluding tests with immediate HTs)		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified.		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").		

Login Sample Receipt Checklist

Client: ENRX, Inc.

Job Number: 860-35921-1

Login Number: 35921

List Number: 2

Creator: Palmar, Pedro

List Source: Eurofins Houston

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.		
The cooler's custody seal, if present, is intact.		
Sample custody seals, if present, are intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the containers received and the COC.		
Samples are received within Holding Time (excluding tests with immediate HTs)		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified.		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Residual Chlorine Checked.		

Appendix C

ANALYTICAL REPORT

June 15, 2023

EN Rx, Inc.

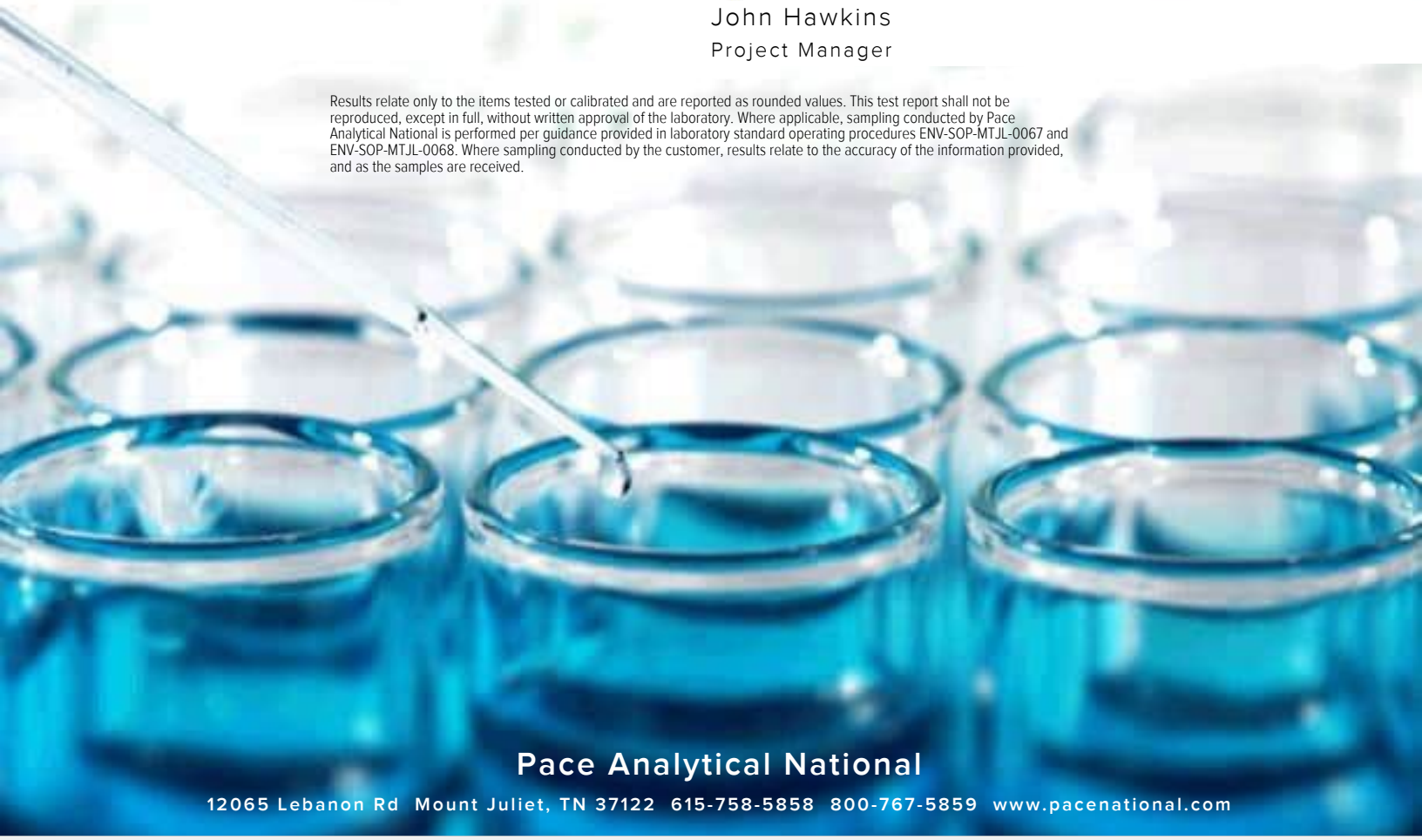
Sample Delivery Group:	L1623116
Samples Received:	06/06/2023
Project Number:	
Description:	Pest in soil

Report To: Eric Arenberg
3218 River Road
Tampa, FL 33598

Entire Report Reviewed By:

John Hawkins
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.



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SAMPLE SUMMARY

801 L1623116-01 Solid

Collected by	Collected date/time	Received date/time
Lance Robinson	06/05/23 11:55	06/06/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG2072869	1	06/07/23 14:26	06/07/23 15:02	CMK	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG2073732	1	06/08/23 23:04	06/09/23 18:41	HMH	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG2073732	20	06/08/23 23:04	06/15/23 01:16	RDH	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

John Hawkins
Project Manager

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	84.0		1	06/07/2023 15:02	WG2072869

Pesticides (GC) by Method 8081

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Aldrin	U		0.00448	0.0238	1	06/09/2023 18:41	WG2073732
Alpha BHC	U		0.00438	0.0238	1	06/09/2023 18:41	WG2073732
Beta BHC	U		0.00451	0.0238	1	06/09/2023 18:41	WG2073732
Delta BHC	U		0.00412	0.0238	1	06/09/2023 18:41	WG2073732
Gamma BHC	U		0.00410	0.0238	1	06/09/2023 18:41	WG2073732
Chlordane	U		0.123	0.357	1	06/09/2023 18:41	WG2073732
4,4-DDD	U		0.00441	0.0238	1	06/09/2023 18:41	WG2073732
4,4-DDE	1.36		0.0872	0.476	20	06/15/2023 01:16	WG2073732
4,4-DDT	U		0.00747	0.0238	1	06/09/2023 18:41	WG2073732
Dieldrin	U		0.00410	0.0238	1	06/09/2023 18:41	WG2073732
Endosulfan I	U		0.00432	0.0238	1	06/09/2023 18:41	WG2073732
Endosulfan II	U		0.00399	0.0238	1	06/09/2023 18:41	WG2073732
Endosulfan sulfate	U		0.00433	0.0238	1	06/09/2023 18:41	WG2073732
Endrin	U		0.00417	0.0238	1	06/09/2023 18:41	WG2073732
Endrin aldehyde	U		0.00404	0.0238	1	06/09/2023 18:41	WG2073732
Endrin ketone	U		0.00847	0.0238	1	06/09/2023 18:41	WG2073732
Hexachlorobenzene	U		0.00412	0.0238	1	06/09/2023 18:41	WG2073732
Heptachlor	U		0.00510	0.0238	1	06/09/2023 18:41	WG2073732
Heptachlor epoxide	U		0.00404	0.0238	1	06/09/2023 18:41	WG2073732
Methoxychlor	U		0.00576	0.0238	1	06/09/2023 18:41	WG2073732
Toxaphene	17.6		2.95	9.53	20	06/15/2023 01:16	WG2073732
(S) Decachlorobiphenyl	*128*	J7		*10.0-135*		*06/15/2023 01:16*	WG2073732
(S) Decachlorobiphenyl	*63.1*			*10.0-135*		*06/09/2023 18:41*	WG2073732
(S) Tetrachloro-m-xylene	*83.1*			*10.0-139*		*06/09/2023 18:41*	WG2073732
(S) Tetrachloro-m-xylene	*110*	J7		*10.0-139*		*06/15/2023 01:16*	WG2073732

Method Blank (MB)

(MB) R3934118-1 06/07/23 15:02

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.00200			

L1623117-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1623117-02 06/07/23 15:02 • (DUP) R3934118-3 06/07/23 15:02

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	84.7	84.1	1	0.730		10

Laboratory Control Sample (LCS)

(LCS) R3934118-2 06/07/23 15:02

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	85.0-115	

Method Blank (MB)

(MB) R3936537-1 06/09/23 18:10

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Aldrin	U		0.00376	0.0200
Alpha BHC	U		0.00368	0.0200
Beta BHC	U		0.00379	0.0200
Delta BHC	U		0.00346	0.0200
Gamma BHC	U		0.00344	0.0200
Chlordane	U		0.103	0.300
4,4-DDD	U		0.00370	0.0200
4,4-DDE	U		0.00366	0.0200
4,4-DDT	U		0.00627	0.0200
Dieldrin	U		0.00344	0.0200
Endosulfan I	U		0.00363	0.0200
Endosulfan II	U		0.00335	0.0200
Endosulfan sulfate	U		0.00364	0.0200
Endrin	U		0.00350	0.0200
Endrin aldehyde	U		0.00339	0.0200
Endrin ketone	U		0.00711	0.0200
Hexachlorobenzene	U		0.00346	0.0200
Heptachlor	U		0.00428	0.0200
Heptachlor epoxide	U		0.00339	0.0200
Methoxychlor	U		0.00484	0.0200
Toxaphene	U		0.124	0.400
(S) Decachlorobiphenyl	*73.9*			*10.0-135*
(S) Tetrachloro-m-xylene	*81.5*			*10.0-139*

Laboratory Control Sample (LCS)

(LCS) R3936537-2 06/09/23 18:20

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Aldrin	0.0666	0.0479	71.9	34.0-136	
Alpha BHC	0.0666	0.0499	74.9	34.0-139	
Beta BHC	0.0666	0.0471	70.7	34.0-133	
Delta BHC	0.0666	0.0475	71.3	34.0-135	
Gamma BHC	0.0666	0.0501	75.2	34.0-136	
4,4-DDD	0.0666	0.0462	69.4	33.0-141	
4,4-DDE	0.0666	0.0438	65.8	34.0-134	
4,4-DDT	0.0666	0.0490	73.6	30.0-143	
Dieldrin	0.0666	0.0464	69.7	35.0-137	
Endosulfan I	0.0666	0.0458	68.8	34.0-134	

Laboratory Control Sample (LCS)

(LCS) R3936537-2 06/09/23 18:20

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Endosulfan II	0.0666	0.0454	68.2	35.0-132	
Endosulfan sulfate	0.0666	0.0439	65.9	35.0-132	
Endrin	0.0666	0.0488	73.3	34.0-137	
Endrin aldehyde	0.0666	0.0394	59.2	23.0-121	
Endrin ketone	0.0666	0.0442	66.4	35.0-144	
Hexachlorobenzene	0.0666	0.0469	70.4	33.0-129	
Heptachlor	0.0666	0.0521	78.2	36.0-141	
Heptachlor epoxide	0.0666	0.0464	69.7	36.0-134	
Methoxychlor	0.0666	0.0513	77.0	28.0-150	
(S) Decachlorobiphenyl			*56.2*	*10.0-135*	
(S) Tetrachloro-m-xylene			*63.7*	*10.0-139*	

L1623629-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1623629-03 06/14/23 19:15 • (MS) R3937093-1 06/14/23 19:24 • (MSD) R3937093-2 06/14/23 19:33

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aldrin	0.0822	U	0.0574	0.0497	69.8	60.8	1	20.0-135			14.4	37
Alpha BHC	0.0822	U	0.0704	0.0687	85.7	84.1	1	27.0-140			2.50	35
Beta BHC	0.0822	U	0.0631	0.0626	76.8	76.6	1	23.0-141			0.789	37
Delta BHC	0.0822	U	0.0643	0.0639	78.3	78.3	1	21.0-138			0.580	35
Gamma BHC	0.0822	U	0.0675	0.0677	82.2	82.9	1	27.0-137			0.183	36
4,4-DDD	0.0822	U	0.0587	0.0592	71.5	72.5	1	15.0-152			0.840	39
4,4-DDE	0.0822	U	0.0553	0.0483	67.3	59.2	1	10.0-152			13.4	40
4,4-DDT	0.0822	U	0.0617	0.0538	75.1	65.9	1	10.0-151	P	P	13.7	40
Dieldrin	0.0822	U	0.0669	0.0636	81.4	77.8	1	17.0-145			5.13	37
Endosulfan I	0.0822	U	0.0544	0.0547	66.2	66.9	1	20.0-137			0.455	36
Endosulfan II	0.0822	U	0.0675	0.0595	82.2	72.8	1	15.0-141			12.7	37
Endosulfan sulfate	0.0822	U	0.0758	0.0787	92.3	96.4	1	15.0-143			3.69	38
Endrin	0.0822	U	0.0674	0.0651	82.1	79.7	1	19.0-143			3.55	37
Endrin aldehyde	0.0822	U	0.0584	0.0535	71.0	65.6	1	10.0-139			8.64	40
Endrin ketone	0.0822	U	0.0639	0.0632	77.8	77.4	1	17.0-149			1.17	38
Hexachlorobenzene	0.0822	U	0.0574	0.0560	69.8	68.6	1	25.0-126			2.40	35
Heptachlor	0.0822	U	0.0664	0.0621	80.8	76.0	1	22.0-138			6.75	37
Heptachlor epoxide	0.0822	U	0.0590	0.0571	71.8	70.0	1	22.0-138		P	3.20	36
Methoxychlor	0.0822	U	0.0698	0.0678	84.9	83.0	1	10.0-159			2.88	40
(S) Decachlorobiphenyl					*108*	*46.0*		*10.0-135*				
(S) Tetrachloro-m-xylene					*146*	*67.4*		*10.0-139*	J1			

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
MDL (dry)	Method Detection Limit.
RDL	Reported Detection Limit.
RDL (dry)	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits.
J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.
P	RPD between the primary and confirmatory analysis exceeded 40%.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

G184

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at https://info.pacelabs.com/hubfs/pas-standard-terms.pdf.

Page : 1 Of 1

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:	
Company: EN Rx	Report To: Eric Arenberg	Attention:	
Address: 3218 River Road	Copy To:	Company Name:	Regulatory Agency
Tampa, FL 33598		Address:	
Email:	Purchase Order #:	Pace Quote:	
Phone: (877)747-3679 Fax:	Project Name: Pest in GW Soil	Pace Project Manager: cameron.meynardie@pacelabs.com,	State / Location
Requested Due Date: ASAP	Project #:	Pace Profile #: 16500-1	FL

MATRIX	CODE
Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Other	OT
Tissue	TS

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Requested Analysis Filtered (Y/N) Y/N	Analyses Test: 8081	Residual Chlorine (Y/N)	
1	801	S	G	6/5	1155	—	—		1										✓		-01
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

L1623116
No
Regulated
Bench
Test
Internal
Result
Only

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
Bottle Kit	Laetha Shaffer Pace	05/30/23	9:33				
Laurie Robinson	ENRX	6/5/23	1300				
				Christopher Hedden (19)	6/6/23	0900	

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Laurie Robinson

SIGNATURE of SAMPLER: DATE Signed: 6/5/23

TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

NSAT 23-340-233 Sample Receipt Checklist

COC Seal Present/Intact:	X Y N	If Applicable	
COC Signed/Accurate:	X Y N	VOA Zero Headspace:	Y N
Bottles arrive intact:	X Y N	Pres.Correct/Check:	Y N
Correct bottles used:	X Y N		
Sufficient volume sent:	X Y N		
RAD Screen <0.5 mR/hr:	X Y N		

6/6-NCF-L1623116 ENRXPFL

R5

Time estimate: oh **Time spent:** oh

Members

Hailey Melson (responsible) JC Jeff Carr JVH John V Hawkins

Due on *9 June 2023 8:00 AM* for target *Done*

- [ ] Parameter(s) past holding time
- [x] Temperature not in range
- [ ] Improper container type
- [ ] pH not in range
- [ ] Insufficient sample volume
- [ ] Sample is biphasic
- [ ] Vials received with headspace
- [ ] Broken container
- [ ] Sufficient sample remains
- [ ] If broken container: Insufficient packing material around container
- [ ] If broken container: Insufficient packing material inside cooler
- [ ] If broken container: Improper handling by carrier:_____
- [ ] If broken container: Sample was frozen
- [ ] If broken container: Container lid not intact
- [ ] Client informed by Call
- [ ] Client informed by Email
- [ ] Client informed by Voicemail
- [ ] Date/Time:_____
- [ ] PM initials:_____
- [ ] Client Contact:_____

Comments

Hailey Melson *6 June 2023 4:13 PM*

Samples out of temp. Temp = 23.3

Jeff Carr *8 June 2023 12:06 PM*

Proceed.

Hailey Melson *8 June 2023 12:30 PM*

Done

Appendix D

ANALYTICAL REPORT

May 18, 2023

EN Rx, Inc.

Sample Delivery Group:	L1613284
Samples Received:	05/05/2023
Project Number:	
Description:	

Report To: Lance I. Robinson
15311 40th Ct E
Parrish, FL 34219

Entire Report Reviewed By:

John Hawkins
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

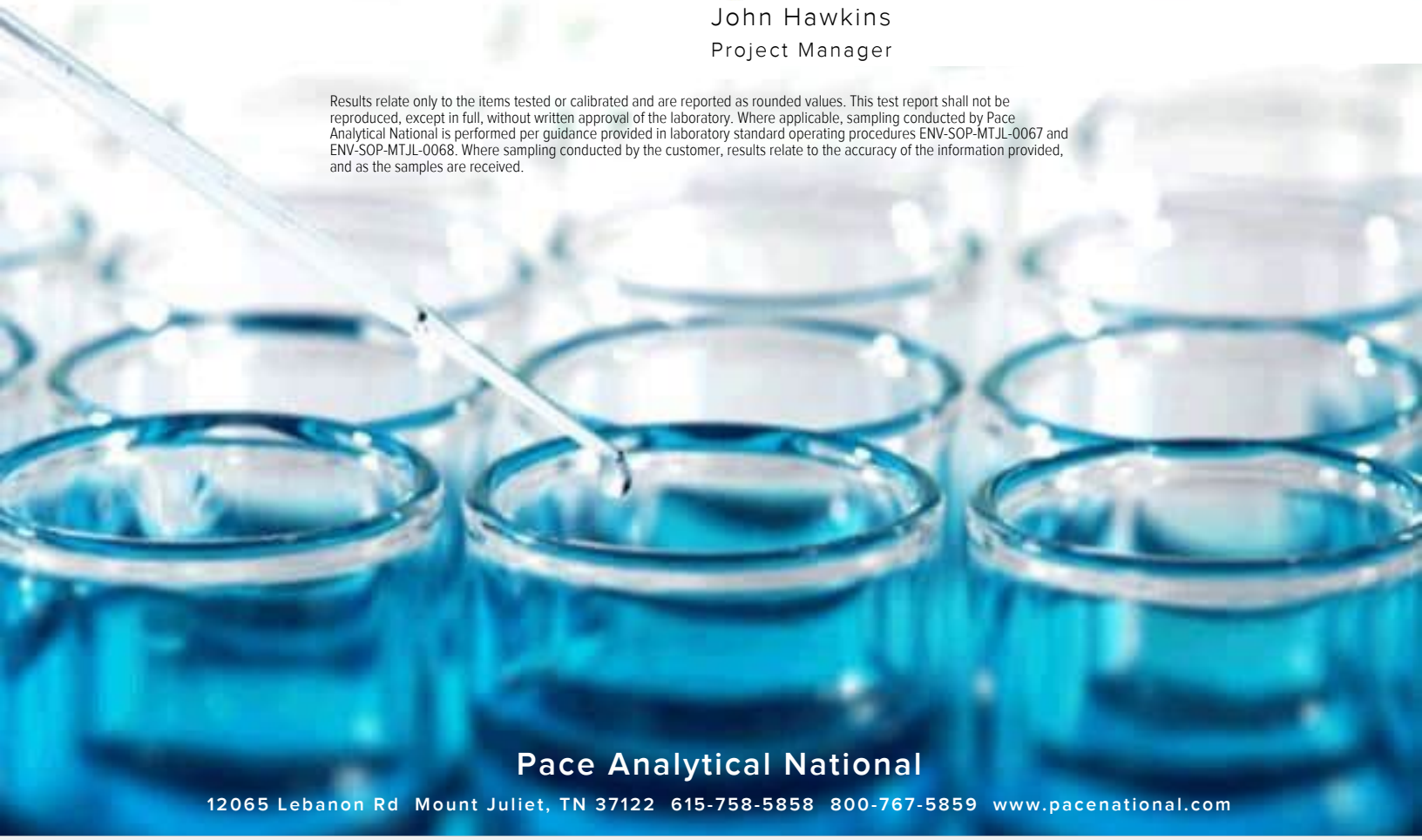

TABLE OF CONTENTS

704 L1613284-01 Solid

Collected by: LR | Collected date/time: 05/03/23 14:49 | Received date/time: 05/05/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG2055867	1	05/09/23 12:04	05/09/23 12:15	CMK	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG2057968	1	05/11/23 14:09	05/11/23 18:32	LTB	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG2057968	10	05/11/23 14:09	05/13/23 14:32	LTB	Mt. Juliet, TN

703 L1613284-02 Solid

Collected by: LR | Collected date/time: 05/03/23 14:45 | Received date/time: 05/05/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG2055867	1	05/09/23 12:04	05/09/23 12:15	CMK	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG2057968	1	05/11/23 14:09	05/11/23 18:42	LTB	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG2057968	20	05/11/23 14:09	05/12/23 14:22	LTB	Mt. Juliet, TN

702 L1613284-03 Solid

Collected by: LR | Collected date/time: 05/03/23 14:41 | Received date/time: 05/05/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG2055867	1	05/09/23 12:04	05/09/23 12:15	CMK	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG2057968	1	05/11/23 14:09	05/11/23 18:52	LTB	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG2057968	100	05/11/23 14:09	05/12/23 14:43	LTB	Mt. Juliet, TN

401 L1613284-04 Solid

Collected by: LR | Collected date/time: 05/03/23 14:52 | Received date/time: 05/05/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG2055867	1	05/09/23 12:04	05/09/23 12:15	CMK	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG2057968	1	05/11/23 14:09	05/11/23 19:03	LTB	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG2057968	100	05/11/23 14:09	05/12/23 14:53	LTB	Mt. Juliet, TN

405 L1613284-05 Solid

Collected by: LR | Collected date/time: 05/03/23 14:54 | Received date/time: 05/05/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG2055868	1	05/09/23 11:47	05/09/23 12:02	CMK	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG2057968	1	05/11/23 14:09	05/11/23 19:13	LTB	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG2057968	1	05/11/23 14:09	05/16/23 17:43	AMM	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG2057968	10	05/11/23 14:09	05/13/23 23:10	RDH	Mt. Juliet, TN

HR4C L1613284-06 Solid

Collected by: LR | Collected date/time: 05/03/23 14:57 | Received date/time: 05/05/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG2055868	1	05/09/23 11:47	05/09/23 12:02	CMK	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG2057968	1	05/11/23 14:09	05/11/23 19:23	LTB	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG2057968	200	05/11/23 14:09	05/13/23 14:50	LTB	Mt. Juliet, TN

HR1 L1613284-07 Solid

Collected by: LR | Collected date/time: 05/03/23 15:05 | Received date/time: 05/05/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG2055868	1	05/09/23 11:47	05/09/23 12:02	CMK	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG2057968	1	05/11/23 14:09	05/11/23 19:34	LTB	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG2057968	200	05/11/23 14:09	05/13/23 15:00	LTB	Mt. Juliet, TN

R6 L1613284-08 Solid

Collected by: LR | Collected date/time: 05/03/23 16:05 | Received date/time: 05/05/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG2055868	1	05/09/23 11:47	05/09/23 12:02	CMK	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG2057968	1	05/11/23 14:09	05/11/23 21:37	LTB	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG2057968	100	05/11/23 14:09	05/12/23 15:24	HLA	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG2057968	5	05/11/23 14:09	05/16/23 08:56	RDH	Mt. Juliet, TN

R12 L1613284-09 Solid

Collected by: LR | Collected date/time: 05/03/23 16:10 | Received date/time: 05/05/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG2055868	1	05/09/23 11:47	05/09/23 12:02	CMK	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG2057968	1	05/11/23 14:09	05/11/23 19:44	LTB	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG2057968	200	05/11/23 14:09	05/13/23 15:09	LTB	Mt. Juliet, TN

R30 L1613284-10 Solid

Collected by: LR | Collected date/time: 05/03/23 16:15 | Received date/time: 05/05/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG2055868	1	05/09/23 11:47	05/09/23 12:02	CMK	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG2057968	1	05/11/23 14:09	05/11/23 19:54	LTB	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG2057968	200	05/11/23 14:09	05/13/23 15:18	LTB	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

John Hawkins
Project Manager

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	82.3		1	05/09/2023 12:15	WG2055867

Pesticides (GC) by Method 8081

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Aldrin	U		0.00457	0.0243	1	05/11/2023 18:32	WG2057968
Alpha BHC	U		0.00447	0.0243	1	05/11/2023 18:32	WG2057968
Beta BHC	U		0.00461	0.0243	1	05/11/2023 18:32	WG2057968
Delta BHC	U		0.00421	0.0243	1	05/11/2023 18:32	WG2057968
Gamma BHC	U		0.00418	0.0243	1	05/11/2023 18:32	WG2057968
Chlordane	U		0.125	0.365	1	05/11/2023 18:32	WG2057968
4,4-DDD	U		0.00450	0.0243	1	05/11/2023 18:32	WG2057968
4,4-DDE	0.303		0.00445	0.0243	1	05/11/2023 18:32	WG2057968
4,4-DDT	U		0.00762	0.0243	1	05/11/2023 18:32	WG2057968
Dieldrin	U		0.00418	0.0243	1	05/11/2023 18:32	WG2057968
Endosulfan I	U		0.00441	0.0243	1	05/11/2023 18:32	WG2057968
Endosulfan II	U		0.00407	0.0243	1	05/11/2023 18:32	WG2057968
Endosulfan sulfate	U		0.00442	0.0243	1	05/11/2023 18:32	WG2057968
Endrin	U		0.00425	0.0243	1	05/11/2023 18:32	WG2057968
Endrin aldehyde	U		0.00412	0.0243	1	05/11/2023 18:32	WG2057968
Endrin ketone	U		0.00864	0.0243	1	05/11/2023 18:32	WG2057968
Hexachlorobenzene	U		0.00421	0.0243	1	05/11/2023 18:32	WG2057968
Heptachlor	U		0.00520	0.0243	1	05/11/2023 18:32	WG2057968
Heptachlor epoxide	U		0.00412	0.0243	1	05/11/2023 18:32	WG2057968
Methoxychlor	U		0.00588	0.0243	1	05/11/2023 18:32	WG2057968
Toxaphene	6.38		1.51	4.86	10	05/13/2023 14:32	WG2057968
(S) Decachlorobiphenyl	*52.6*			*10.0-135*		*05/13/2023 14:32*	WG2057968
(S) Decachlorobiphenyl	*72.7*			*10.0-135*		*05/11/2023 18:32*	WG2057968
(S) Tetrachloro-m-xylene	*60.1*			*10.0-139*		*05/13/2023 14:32*	WG2057968
(S) Tetrachloro-m-xylene	*63.7*			*10.0-139*		*05/11/2023 18:32*	WG2057968

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	79.8		1	05/09/2023 12:15	WG2055867

Pesticides (GC) by Method 8081

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Aldrin	U		0.00471	0.0251	1	05/11/2023 18:42	WG2057968
Alpha BHC	U		0.00461	0.0251	1	05/11/2023 18:42	WG2057968
Beta BHC	U		0.00475	0.0251	1	05/11/2023 18:42	WG2057968
Delta BHC	U		0.00434	0.0251	1	05/11/2023 18:42	WG2057968
Gamma BHC	U		0.00431	0.0251	1	05/11/2023 18:42	WG2057968
Chlordane	U		0.129	0.376	1	05/11/2023 18:42	WG2057968
4,4-DDD	U		0.00464	0.0251	1	05/11/2023 18:42	WG2057968
4,4-DDE	4.54		0.0917	0.501	20	05/12/2023 14:22	WG2057968
4,4-DDT	U		0.00786	0.0251	1	05/11/2023 18:42	WG2057968
Dieldrin	U		0.00431	0.0251	1	05/11/2023 18:42	WG2057968
Endosulfan I	U		0.00455	0.0251	1	05/11/2023 18:42	WG2057968
Endosulfan II	U		0.00420	0.0251	1	05/11/2023 18:42	WG2057968
Endosulfan sulfate	U		0.00456	0.0251	1	05/11/2023 18:42	WG2057968
Endrin	U		0.00439	0.0251	1	05/11/2023 18:42	WG2057968
Endrin aldehyde	U		0.00425	0.0251	1	05/11/2023 18:42	WG2057968
Endrin ketone	U		0.00891	0.0251	1	05/11/2023 18:42	WG2057968
Hexachlorobenzene	U		0.00434	0.0251	1	05/11/2023 18:42	WG2057968
Heptachlor	U		0.00536	0.0251	1	05/11/2023 18:42	WG2057968
Heptachlor epoxide	U		0.00425	0.0251	1	05/11/2023 18:42	WG2057968
Methoxychlor	U		0.00606	0.0251	1	05/11/2023 18:42	WG2057968
Toxaphene	32.1		3.11	10.0	20	05/12/2023 14:22	WG2057968
(S) Decachlorobiphenyl	*54.2*	J7		*10.0-135*		*05/12/2023 14:22*	WG2057968
(S) Decachlorobiphenyl	*52.3*			*10.0-135*		*05/11/2023 18:42*	WG2057968
(S) Tetrachloro-m-xylene	*45.3*	J7		*10.0-139*		*05/12/2023 14:22*	WG2057968
(S) Tetrachloro-m-xylene	*44.1*			*10.0-139*		*05/11/2023 18:42*	WG2057968

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	80.2		1	05/09/2023 12:15	WG2055867

Pesticides (GC) by Method 8081

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Aldrin	U		0.00469	0.0249	1	05/11/2023 18:52	WG2057968
Alpha BHC	U		0.00459	0.0249	1	05/11/2023 18:52	WG2057968
Beta BHC	U		0.00473	0.0249	1	05/11/2023 18:52	WG2057968
Delta BHC	U		0.00431	0.0249	1	05/11/2023 18:52	WG2057968
Gamma BHC	U		0.00429	0.0249	1	05/11/2023 18:52	WG2057968
Chlordane	U		0.128	0.374	1	05/11/2023 18:52	WG2057968
4,4-DDD	U		0.00461	0.0249	1	05/11/2023 18:52	WG2057968
4,4-DDE	U		0.00456	0.0249	1	05/11/2023 18:52	WG2057968
4,4-DDT	U		0.00782	0.0249	1	05/11/2023 18:52	WG2057968
Dieldrin	U		0.00429	0.0249	1	05/11/2023 18:52	WG2057968
Endosulfan I	U		0.00453	0.0249	1	05/11/2023 18:52	WG2057968
Endosulfan II	U		0.00418	0.0249	1	05/11/2023 18:52	WG2057968
Endosulfan sulfate	U		0.00454	0.0249	1	05/11/2023 18:52	WG2057968
Endrin	U		0.00436	0.0249	1	05/11/2023 18:52	WG2057968
Endrin aldehyde	U		0.00423	0.0249	1	05/11/2023 18:52	WG2057968
Endrin ketone	U		0.00887	0.0249	1	05/11/2023 18:52	WG2057968
Hexachlorobenzene	U		0.00431	0.0249	1	05/11/2023 18:52	WG2057968
Heptachlor	U		0.00534	0.0249	1	05/11/2023 18:52	WG2057968
Heptachlor epoxide	U		0.00423	0.0249	1	05/11/2023 18:52	WG2057968
Methoxychlor	U		0.00604	0.0249	1	05/11/2023 18:52	WG2057968
Toxaphene	99.4		15.5	49.9	100	05/12/2023 14:43	WG2057968
(S) Decachlorobiphenyl	*91.5*	J7		*10.0-135*		*05/12/2023 14:43*	WG2057968
(S) Decachlorobiphenyl	*81.4*			*10.0-135*		*05/11/2023 18:52*	WG2057968
(S) Tetrachloro-m-xylene	*66.8*			*10.0-139*		*05/11/2023 18:52*	WG2057968
(S) Tetrachloro-m-xylene	*72.9*	J7		*10.0-139*		*05/12/2023 14:43*	WG2057968

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	85.5		1	05/09/2023 12:15	WG2055867

Pesticides (GC) by Method 8081

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Aldrin	U		0.00440	0.0234	1	05/11/2023 19:03	WG2057968
Alpha BHC	U		0.00430	0.0234	1	05/11/2023 19:03	WG2057968
Beta BHC	U		0.00443	0.0234	1	05/11/2023 19:03	WG2057968
Delta BHC	U		0.00405	0.0234	1	05/11/2023 19:03	WG2057968
Gamma BHC	U		0.00402	0.0234	1	05/11/2023 19:03	WG2057968
Chlordane	U		0.120	0.351	1	05/11/2023 19:03	WG2057968
4,4-DDD	U		0.00433	0.0234	1	05/11/2023 19:03	WG2057968
4,4-DDE	U		0.00428	0.0234	1	05/11/2023 19:03	WG2057968
4,4-DDT	U		0.00733	0.0234	1	05/11/2023 19:03	WG2057968
Dieldrin	U		0.00402	0.0234	1	05/11/2023 19:03	WG2057968
Endosulfan I	U		0.00424	0.0234	1	05/11/2023 19:03	WG2057968
Endosulfan II	U		0.00392	0.0234	1	05/11/2023 19:03	WG2057968
Endosulfan sulfate	U		0.00426	0.0234	1	05/11/2023 19:03	WG2057968
Endrin	U		0.00409	0.0234	1	05/11/2023 19:03	WG2057968
Endrin aldehyde	U		0.00396	0.0234	1	05/11/2023 19:03	WG2057968
Endrin ketone	U		0.00831	0.0234	1	05/11/2023 19:03	WG2057968
Hexachlorobenzene	U		0.00405	0.0234	1	05/11/2023 19:03	WG2057968
Heptachlor	U		0.00500	0.0234	1	05/11/2023 19:03	WG2057968
Heptachlor epoxide	U		0.00396	0.0234	1	05/11/2023 19:03	WG2057968
Methoxychlor	U		0.00566	0.0234	1	05/11/2023 19:03	WG2057968
Toxaphene	67.9		14.5	46.8	100	05/12/2023 14:53	WG2057968
(S) Decachlorobiphenyl	*83.2*	J7		*10.0-135*		*05/12/2023 14:53*	WG2057968
(S) Decachlorobiphenyl	*65.8*			*10.0-135*		*05/11/2023 19:03*	WG2057968
(S) Tetrachloro-m-xylene	*56.7*	J7		*10.0-139*		*05/12/2023 14:53*	WG2057968
(S) Tetrachloro-m-xylene	*46.5*			*10.0-139*		*05/11/2023 19:03*	WG2057968

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	74.2		1	05/09/2023 12:02	WG2055868

Pesticides (GC) by Method 8081

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Aldrin	U		0.00507	0.0270	1	05/11/2023 19:13	WG2057968
Alpha BHC	U		0.00496	0.0270	1	05/11/2023 19:13	WG2057968
Beta BHC	U		0.00511	0.0270	1	05/11/2023 19:13	WG2057968
Delta BHC	U		0.00466	0.0270	1	05/11/2023 19:13	WG2057968
Gamma BHC	U		0.00464	0.0270	1	05/11/2023 19:13	WG2057968
Chlordane	U		0.139	0.404	1	05/11/2023 19:13	WG2057968
4,4-DDD	U		0.00499	0.0270	1	05/11/2023 19:13	WG2057968
4,4-DDE	2.33		0.0493	0.270	10	05/13/2023 23:10	WG2057968
4,4-DDT	U		0.00845	0.0270	1	05/16/2023 17:43	WG2057968
Dieldrin	U		0.00464	0.0270	1	05/11/2023 19:13	WG2057968
Endosulfan I	U		0.00489	0.0270	1	05/11/2023 19:13	WG2057968
Endosulfan II	U		0.00451	0.0270	1	05/11/2023 19:13	WG2057968
Endosulfan sulfate	U		0.00491	0.0270	1	05/11/2023 19:13	WG2057968
Endrin	U		0.00472	0.0270	1	05/11/2023 19:13	WG2057968
Endrin aldehyde	U		0.00457	0.0270	1	05/11/2023 19:13	WG2057968
Endrin ketone	U		0.00958	0.0270	1	05/11/2023 19:13	WG2057968
Hexachlorobenzene	U		0.00466	0.0270	1	05/11/2023 19:13	WG2057968
Heptachlor	U		0.00577	0.0270	1	05/11/2023 19:13	WG2057968
Heptachlor epoxide	U		0.00457	0.0270	1	05/11/2023 19:13	WG2057968
Methoxychlor	U		0.00652	0.0270	1	05/11/2023 19:13	WG2057968
Toxaphene	16.7		1.67	5.39	10	05/13/2023 23:10	WG2057968
(S) Decachlorobiphenyl	*76.1*			*10.0-135*		*05/13/2023 23:10*	WG2057968
(S) Decachlorobiphenyl	*54.4*			*10.0-135*		*05/16/2023 17:43*	WG2057968
(S) Decachlorobiphenyl	*70.8*			*10.0-135*		*05/11/2023 19:13*	WG2057968
(S) Tetrachloro-m-xylene	*61.9*			*10.0-139*		*05/16/2023 17:43*	WG2057968
(S) Tetrachloro-m-xylene	*53.3*			*10.0-139*		*05/11/2023 19:13*	WG2057968
(S) Tetrachloro-m-xylene	*67.9*			*10.0-139*		*05/13/2023 23:10*	WG2057968

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	94.5		1	05/09/2023 12:02	WG2055868

Pesticides (GC) by Method 8081

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Aldrin	U		0.00398	0.0212	1	05/11/2023 19:23	WG2057968
Alpha BHC	U		0.00389	0.0212	1	05/11/2023 19:23	WG2057968
Beta BHC	U		0.00401	0.0212	1	05/11/2023 19:23	WG2057968
Delta BHC	U		0.00366	0.0212	1	05/11/2023 19:23	WG2057968
Gamma BHC	U		0.00364	0.0212	1	05/11/2023 19:23	WG2057968
Chlordane	U		0.109	0.317	1	05/11/2023 19:23	WG2057968
4,4-DDD	U		0.00391	0.0212	1	05/11/2023 19:23	WG2057968
4,4-DDE	U		0.00387	0.0212	1	05/11/2023 19:23	WG2057968
4,4-DDT	U		0.00663	0.0212	1	05/11/2023 19:23	WG2057968
Dieldrin	U		0.00364	0.0212	1	05/11/2023 19:23	WG2057968
Endosulfan I	U		0.00384	0.0212	1	05/11/2023 19:23	WG2057968
Endosulfan II	U		0.00354	0.0212	1	05/11/2023 19:23	WG2057968
Endosulfan sulfate	U		0.00385	0.0212	1	05/11/2023 19:23	WG2057968
Endrin	U		0.00370	0.0212	1	05/11/2023 19:23	WG2057968
Endrin aldehyde	U		0.00359	0.0212	1	05/11/2023 19:23	WG2057968
Endrin ketone	U		0.00752	0.0212	1	05/11/2023 19:23	WG2057968
Hexachlorobenzene	U		0.00366	0.0212	1	05/11/2023 19:23	WG2057968
Heptachlor	U		0.00453	0.0212	1	05/11/2023 19:23	WG2057968
Heptachlor epoxide	U		0.00359	0.0212	1	05/11/2023 19:23	WG2057968
Methoxychlor	U		0.00512	0.0212	1	05/11/2023 19:23	WG2057968
Toxaphene	271		26.2	84.6	200	05/13/2023 14:50	WG2057968
(S) Decachlorobiphenyl	*115*			*10.0-135*		*05/11/2023 19:23*	WG2057968
(S) Decachlorobiphenyl	*104*	J7		*10.0-135*		*05/13/2023 14:50*	WG2057968
(S) Tetrachloro-m-xylene	*80.9*	J7		*10.0-139*		*05/13/2023 14:50*	WG2057968
(S) Tetrachloro-m-xylene	*66.7*			*10.0-139*		*05/11/2023 19:23*	WG2057968

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	93.1		1	05/09/2023 12:02	WG2055868

Pesticides (GC) by Method 8081

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Aldrin	U		0.00404	0.0215	1	05/11/2023 19:34	WG2057968
Alpha BHC	U		0.00395	0.0215	1	05/11/2023 19:34	WG2057968
Beta BHC	U		0.00407	0.0215	1	05/11/2023 19:34	WG2057968
Delta BHC	U		0.00372	0.0215	1	05/11/2023 19:34	WG2057968
Gamma BHC	U		0.00369	0.0215	1	05/11/2023 19:34	WG2057968
Chlordane	U		0.111	0.322	1	05/11/2023 19:34	WG2057968
4,4-DDD	U		0.00397	0.0215	1	05/11/2023 19:34	WG2057968
4,4-DDE	U		0.00393	0.0215	1	05/11/2023 19:34	WG2057968
4,4-DDT	8.74	P	1.34	4.30	200	05/13/2023 15:00	WG2057968
Dieldrin	U		0.00369	0.0215	1	05/11/2023 19:34	WG2057968
Endosulfan I	U		0.00390	0.0215	1	05/11/2023 19:34	WG2057968
Endosulfan II	U		0.00360	0.0215	1	05/11/2023 19:34	WG2057968
Endosulfan sulfate	U		0.00391	0.0215	1	05/11/2023 19:34	WG2057968
Endrin	U		0.00376	0.0215	1	05/11/2023 19:34	WG2057968
Endrin aldehyde	U		0.00364	0.0215	1	05/11/2023 19:34	WG2057968
Endrin ketone	U		0.00764	0.0215	1	05/11/2023 19:34	WG2057968
Hexachlorobenzene	U		0.00372	0.0215	1	05/11/2023 19:34	WG2057968
Heptachlor	U		0.00460	0.0215	1	05/11/2023 19:34	WG2057968
Heptachlor epoxide	U		0.00364	0.0215	1	05/11/2023 19:34	WG2057968
Methoxychlor	U		0.00520	0.0215	1	05/11/2023 19:34	WG2057968
Toxaphene	203		26.6	85.9	200	05/13/2023 15:00	WG2057968
(S) Decachlorobiphenyl	*111*			*10.0-135*		*05/11/2023 19:34*	WG2057968
(S) Decachlorobiphenyl	*138*	J7		*10.0-135*		*05/13/2023 15:00*	WG2057968
(S) Tetrachloro-m-xylene	*73.7*			*10.0-139*		*05/11/2023 19:34*	WG2057968
(S) Tetrachloro-m-xylene	*138*	J7		*10.0-139*		*05/13/2023 15:00*	WG2057968

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	87.6		1	05/09/2023 12:02	WG2055868

Pesticides (GC) by Method 8081

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Aldrin	U		0.00429	0.0228	1	05/11/2023 21:37	WG2057968
Alpha BHC	U		0.00420	0.0228	1	05/11/2023 21:37	WG2057968
Beta BHC	U		0.00433	0.0228	1	05/11/2023 21:37	WG2057968
Delta BHC	U		0.00395	0.0228	1	05/11/2023 21:37	WG2057968
Gamma BHC	U		0.00393	0.0228	1	05/11/2023 21:37	WG2057968
Chlordane	U		0.118	0.342	1	05/11/2023 21:37	WG2057968
4,4-DDD	U		0.00422	0.0228	1	05/11/2023 21:37	WG2057968
4,4-DDE	1.83		0.0209	0.114	5	05/16/2023 08:56	WG2057968
4,4-DDT	U		0.00716	0.0228	1	05/11/2023 21:37	WG2057968
Dieldrin	U		0.00393	0.0228	1	05/11/2023 21:37	WG2057968
Endosulfan I	U		0.00414	0.0228	1	05/11/2023 21:37	WG2057968
Endosulfan II	U		0.00382	0.0228	1	05/11/2023 21:37	WG2057968
Endosulfan sulfate	U		0.00415	0.0228	1	05/11/2023 21:37	WG2057968
Endrin	U		0.00399	0.0228	1	05/11/2023 21:37	WG2057968
Endrin aldehyde	U		0.00387	0.0228	1	05/11/2023 21:37	WG2057968
Endrin ketone	U		0.00811	0.0228	1	05/11/2023 21:37	WG2057968
Hexachlorobenzene	U		0.00395	0.0228	1	05/11/2023 21:37	WG2057968
Heptachlor	U		0.00488	0.0228	1	05/11/2023 21:37	WG2057968
Heptachlor epoxide	U		0.00387	0.0228	1	05/11/2023 21:37	WG2057968
Methoxychlor	U		0.00552	0.0228	1	05/11/2023 21:37	WG2057968
Toxaphene	64.4		14.2	45.7	100	05/12/2023 15:24	WG2057968
(S) Decachlorobiphenyl	*75.9*			*10.0-135*		*05/11/2023 21:37*	WG2057968
(S) Decachlorobiphenyl	*252*	J1		*10.0-135*		*05/16/2023 08:56*	WG2057968
(S) Decachlorobiphenyl	*129*	J7		*10.0-135*		*05/12/2023 15:24*	WG2057968
(S) Tetrachloro-m-xylene	*78.6*			*10.0-139*		*05/16/2023 08:56*	WG2057968
(S) Tetrachloro-m-xylene	*70.7*			*10.0-139*		*05/11/2023 21:37*	WG2057968
(S) Tetrachloro-m-xylene	*85.0*	J7		*10.0-139*		*05/12/2023 15:24*	WG2057968

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	95.3		1	05/09/2023 12:02	WG2055868

Pesticides (GC) by Method 8081

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Aldrin	U		0.00394	0.0210	1	05/11/2023 19:44	WG2057968
Alpha BHC	U		0.00386	0.0210	1	05/11/2023 19:44	WG2057968
Beta BHC	U		0.00397	0.0210	1	05/11/2023 19:44	WG2057968
Delta BHC	U		0.00363	0.0210	1	05/11/2023 19:44	WG2057968
Gamma BHC	U		0.00361	0.0210	1	05/11/2023 19:44	WG2057968
Chlordane	U		0.108	0.315	1	05/11/2023 19:44	WG2057968
4,4-DDD	U		0.00388	0.0210	1	05/11/2023 19:44	WG2057968
4,4-DDE	22.0		0.768	4.20	200	05/13/2023 15:09	WG2057968
4,4-DDT	U		0.00658	0.0210	1	05/11/2023 19:44	WG2057968
Dieldrin	U		0.00361	0.0210	1	05/11/2023 19:44	WG2057968
Endosulfan I	U		0.00381	0.0210	1	05/11/2023 19:44	WG2057968
Endosulfan II	U		0.00351	0.0210	1	05/11/2023 19:44	WG2057968
Endosulfan sulfate	U		0.00382	0.0210	1	05/11/2023 19:44	WG2057968
Endrin	U		0.00367	0.0210	1	05/11/2023 19:44	WG2057968
Endrin aldehyde	U		0.00356	0.0210	1	05/11/2023 19:44	WG2057968
Endrin ketone	U		0.00746	0.0210	1	05/11/2023 19:44	WG2057968
Hexachlorobenzene	U		0.00363	0.0210	1	05/11/2023 19:44	WG2057968
Heptachlor	U		0.00449	0.0210	1	05/11/2023 19:44	WG2057968
Heptachlor epoxide	U		0.00356	0.0210	1	05/11/2023 19:44	WG2057968
Methoxychlor	U		0.00508	0.0210	1	05/11/2023 19:44	WG2057968
Toxaphene	210		26.0	83.9	200	05/13/2023 15:09	WG2057968
(S) Decachlorobiphenyl	*101*			*10.0-135*		*05/11/2023 19:44*	WG2057968
(S) Decachlorobiphenyl	*87.2*	J7		*10.0-135*		*05/13/2023 15:09*	WG2057968
(S) Tetrachloro-m-xylene	*78.4*	J7		*10.0-139*		*05/13/2023 15:09*	WG2057968
(S) Tetrachloro-m-xylene	*59.7*			*10.0-139*		*05/11/2023 19:44*	WG2057968

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	97.9		1	05/09/2023 12:02	WG2055868

Pesticides (GC) by Method 8081

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Aldrin	U		0.00384	0.0204	1	05/11/2023 19:54	WG2057968
Alpha BHC	U		0.00376	0.0204	1	05/11/2023 19:54	WG2057968
Beta BHC	U		0.00387	0.0204	1	05/11/2023 19:54	WG2057968
Delta BHC	U		0.00353	0.0204	1	05/11/2023 19:54	WG2057968
Gamma BHC	U		0.00351	0.0204	1	05/11/2023 19:54	WG2057968
Chlordane	U		0.105	0.306	1	05/11/2023 19:54	WG2057968
4,4-DDD	U		0.00378	0.0204	1	05/11/2023 19:54	WG2057968
4,4-DDE	24.9		0.748	4.09	200	05/13/2023 15:18	WG2057968
4,4-DDT	U		0.00640	0.0204	1	05/11/2023 19:54	WG2057968
Dieldrin	U		0.00351	0.0204	1	05/11/2023 19:54	WG2057968
Endosulfan I	U		0.00371	0.0204	1	05/11/2023 19:54	WG2057968
Endosulfan II	U		0.00342	0.0204	1	05/11/2023 19:54	WG2057968
Endosulfan sulfate	U		0.00372	0.0204	1	05/11/2023 19:54	WG2057968
Endrin	U		0.00358	0.0204	1	05/11/2023 19:54	WG2057968
Endrin aldehyde	U		0.00346	0.0204	1	05/11/2023 19:54	WG2057968
Endrin ketone	U		0.00726	0.0204	1	05/11/2023 19:54	WG2057968
Hexachlorobenzene	U		0.00353	0.0204	1	05/11/2023 19:54	WG2057968
Heptachlor	U		0.00437	0.0204	1	05/11/2023 19:54	WG2057968
Heptachlor epoxide	U		0.00346	0.0204	1	05/11/2023 19:54	WG2057968
Methoxychlor	U		0.00494	0.0204	1	05/11/2023 19:54	WG2057968
Toxaphene	250		25.3	81.7	200	05/13/2023 15:18	WG2057968
(S) Decachlorobiphenyl	*116*			*10.0-135*		*05/11/2023 19:54*	WG2057968
(S) Decachlorobiphenyl	*87.2*	J7		*10.0-135*		*05/13/2023 15:18*	WG2057968
(S) Tetrachloro-m-xylene	*68.6*	J7		*10.0-139*		*05/13/2023 15:18*	WG2057968
(S) Tetrachloro-m-xylene	*52.7*			*10.0-139*		*05/11/2023 19:54*	WG2057968

Method Blank (MB)

(MB) R3922888-1 05/09/23 12:15

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.00100			

L1613281-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1613281-01 05/09/23 12:15 • (DUP) R3922888-3 05/09/23 12:15

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	83.9	85.1	1	1.40		10

Laboratory Control Sample (LCS)

(LCS) R3922888-2 05/09/23 12:15

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	85.0-115	

Method Blank (MB)

(MB) R3922887-1 05/09/23 12:02

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.00100			

L1613292-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1613292-02 05/09/23 12:02 • (DUP) R3922887-3 05/09/23 12:02

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	74.3	75.1	1	1.06		10

Laboratory Control Sample (LCS)

(LCS) R3922887-2 05/09/23 12:02

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	85.0-115	

Method Blank (MB)

(MB) R3924034-1 05/11/23 17:40

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Aldrin	U		0.00376	0.0200
Alpha BHC	U		0.00368	0.0200
Beta BHC	U		0.00379	0.0200
Delta BHC	U		0.00346	0.0200
Gamma BHC	U		0.00344	0.0200
Chlordane	U		0.103	0.300
4,4-DDD	U		0.00370	0.0200
4,4-DDE	U		0.00366	0.0200
4,4-DDT	U		0.00627	0.0200
Dieldrin	U		0.00344	0.0200
Endosulfan I	U		0.00363	0.0200
Endosulfan II	U		0.00335	0.0200
Endosulfan sulfate	U		0.00364	0.0200
Endrin	U		0.00350	0.0200
Endrin aldehyde	U		0.00339	0.0200
Endrin ketone	U		0.00711	0.0200
Hexachlorobenzene	U		0.00346	0.0200
Heptachlor	U		0.00428	0.0200
Heptachlor epoxide	U		0.00339	0.0200
Methoxychlor	U		0.00484	0.0200
Toxaphene	U		0.124	0.400
(S) Decachlorobiphenyl	*73.7*			*10.0-135*
(S) Tetrachloro-m-xylene	*63.5*			*10.0-139*

Laboratory Control Sample (LCS)

(LCS) R3924034-2 05/11/23 17:50

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Aldrin	0.0666	0.0507	76.1	34.0-136	
Alpha BHC	0.0666	0.0509	76.4	34.0-139	
Beta BHC	0.0666	0.0488	73.3	34.0-133	
Delta BHC	0.0666	0.0490	73.6	34.0-135	
Gamma BHC	0.0666	0.0482	72.4	34.0-136	
4,4-DDD	0.0666	0.0629	94.4	33.0-141	
4,4-DDE	0.0666	0.0505	75.8	34.0-134	
4,4-DDT	0.0666	0.0563	84.5	30.0-143	
Dieldrin	0.0666	0.0535	80.3	35.0-137	
Endosulfan I	0.0666	0.0510	76.6	34.0-134	

Laboratory Control Sample (LCS)

(LCS) R3924034-2 05/11/23 17:50

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Endosulfan II	0.0666	0.0524	78.7	35.0-132	
Endosulfan sulfate	0.0666	0.0516	77.5	35.0-132	
Endrin	0.0666	0.0540	81.1	34.0-137	
Endrin aldehyde	0.0666	0.0517	77.6	23.0-121	
Endrin ketone	0.0666	0.0549	82.4	35.0-144	
Hexachlorobenzene	0.0666	0.0478	71.8	33.0-129	
Heptachlor	0.0666	0.0546	82.0	36.0-141	
Heptachlor epoxide	0.0666	0.0534	80.2	36.0-134	
Methoxychlor	0.0666	0.0648	97.3	28.0-150	P
(S) Decachlorobiphenyl			*89.3*	*10.0-135*	
(S) Tetrachloro-m-xylene			*74.3*	*10.0-139*	

L1613201-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1613201-01 05/11/23 18:01 • (MS) R3924034-3 05/11/23 18:11 • (MSD) R3924034-4 05/11/23 18:21

Analyte	Spike Amount (dry) mg/kg	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aldrin	0.0874	U	0.0546	0.0497	62.5	56.9	1	20.0-135			9.31	37
Alpha BHC	0.0874	U	0.0546	0.0512	62.5	58.6	1	27.0-140			6.45	35
Beta BHC	0.0874	U	0.0539	0.0503	61.7	57.5	1	23.0-141			7.05	37
Delta BHC	0.0874	U	0.0526	0.0487	60.2	55.7	1	21.0-138			7.77	35
Gamma BHC	0.0874	U	0.0518	0.0484	59.3	55.4	1	27.0-137			6.81	36
4,4-DDD	0.0874	U	0.0668	0.0585	76.4	67.0	1	15.0-152			13.2	39
4,4-DDE	0.0874	U	0.0542	0.0488	62.0	55.9	1	10.0-152			10.4	40
4,4-DDT	0.0874	U	0.0604	0.0530	69.1	60.7	1	10.0-151			13.0	40
Dieldrin	0.0874	U	0.0575	0.0529	65.8	60.5	1	17.0-145			8.32	37
Endosulfan I	0.0874	U	0.0551	0.0515	63.1	58.9	1	20.0-137			6.90	36
Endosulfan II	0.0874	U	0.0568	0.0526	65.0	60.2	1	15.0-141			7.67	37
Endosulfan sulfate	0.0874	U	0.0549	0.0508	62.8	58.1	1	15.0-143			7.70	38
Endrin	0.0874	U	0.0584	0.0547	66.8	62.6	1	19.0-143			6.50	37
Endrin aldehyde	0.0874	U	0.0563	0.0512	64.4	58.6	1	10.0-139			9.52	40
Endrin ketone	0.0874	U	0.0584	0.0539	66.8	61.7	1	17.0-149			7.94	38
Hexachlorobenzene	0.0874	U	0.0525	0.0491	60.1	56.2	1	25.0-126			6.72	35
Heptachlor	0.0874	U	0.0584	0.0536	66.8	61.3	1	22.0-138			8.68	37
Heptachlor epoxide	0.0874	U	0.0572	0.0532	65.5	60.8	1	22.0-138			7.37	36
Methoxychlor	0.0874	U	0.0693	0.0633	79.3	72.4	1	10.0-159			9.11	40
(S) Decachlorobiphenyl					*56.8*	*66.1*		*10.0-135*				
(S) Tetrachloro-m-xylene					*48.0*	*59.5*		*10.0-139*				

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
MDL (dry)	Method Detection Limit.
RDL	Reported Detection Limit.
RDL (dry)	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits.
J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.
P	RPD between the primary and confirmatory analysis exceeded 40%.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

CHAIN-OF-CUSTODY Analytical Request Document

Pace Analytical

Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevant fields

LAB USE ONLY- Affix Workorder/Login Label Here or List Pace Workorder Number or MTJL Log-in Number Here

ALL BOLD OUTLINED AREAS are for LAB USE ONLY

Company: ENRx INC.	Billing Information:
Address: 3718 River Road	
Report To: Robinson@enryinc.com	Email To:
Copy To:	Site Collection Info/Address:
Customer Project Name/Number:	State: County/City: Time Zone Collected: [ ]PT [ ]MT [ ]CT [ ]ET
Phone: 3525149844 Email:	Site/Facility ID #: NA
Collected By (print):	Purchase Order # : Quote #:
Collected By (signature):	Turnaround Date Required: 5/12
Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: [ ] Hold:	Rush: (Expedite Charges Apply) [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day
	Compliance Monitoring? [ ] Yes [ ] No
	DW PWS ID #: DW Location Code:
	Immediately Packed on Ice: [ ] Yes [ ] No
	Field Filtered (if applicable): [ ] Yes [ ] No
	Analysis:

Container Preservative Type **

Lab Project Manager:

** Preservative Types: (1) nitric acid, (2) sulfuric acid, (3) hydrochloric acid, (4) sodium hydroxide, (5) zinc acetate, (6) methanol, (7) sodium bisulfate, (8) sodium thiosulfate, (9) hexane, (A) ascorbic acid, (B) ammonium sulfate, (C) ammonium hydroxide, (D) TSP, (U) Unpreserved, (O) Other _____

Analyses

8081 OCP
Toxaphene @ 5-500mg/kg
Hot Interval Info Only
Non Compliant
Bench Study Non Regulated

Container Type: Plastic (P) or Glass (G)

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Collected (or Composite Start) Time	Composite End Date	Composite End Time	Res Cl	# of Ctns	Container Type	Lab Sample # / Comments
704	S	G	5/3	1449				1	G	L1161284-01
703				1445				1		-02
702				1441				1		-03
401				1452				1		-04
405				1454				1		-05
HR4C				1457				1		-06
HR1	X	X	X	1505				1	X	-07
R6				1605				1	X	-08
R12				1610				1	X	-09
R30	X	X	X	1615				5	X	-10

J080

Lab Profile/Line:

Lab Sample Receipt Checklist:	
Custody Seals Present/Intact	Y N NA
Custody Signatures Present	Y N NA
Collector Signature Present	Y N NA
Bottles Intact	Y N NA
Correct Bottles	Y N NA
Sufficient Volume	Y N NA
Samples Received on Ice	Y N NA
VOA - Headspace Acceptable	Y N NA
USDA Regulated Soils	Y N NA
Samples in Holding Time	Y N NA
Residual Chlorine Present	Y N NA
Cl Strips:	
Sample pH Acceptable	Y N NA
pH Strips:	
Sulfide Present	Y N NA
Lead Acetate Strips:	

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: Wet Blue Dry (None)

Packing Material Used: Bubble

Radchem sample(s) screened (<500 cpm): Y N NA

SHORT HOLDS PRESENT (<72 hours): Y N N/A

Lab Tracking #: 1Z37Y44S 13 3896 3992

Samples received via: FEDEX (UPS) Client Courier Pace Courier

LAB Sample Temperature Info:
Temp Blank Received: (Y) N NA
Therm ID#:
Cooler 1 Temp Upon Receipt: __oC
Cooler 1 Therm Corr. Factor: __oC
Cooler 1 Corrected Temp: __oC
Comments:

N5A6 21.6+0=21.6 10

Trip Blank Received: Y N NA
HCL MeOH TSP Other

Relinquished by/Company: (Signature)	Date/Time: 5/3/23 1600	Received by/Company: (Signature)	Date/Time:
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time: 5/6/23 0800

MTJL LAB USE ONLY

Table #:
Acctnum:
Template:
Prelogin:
PM:
PB:

Non Conformance(s): YES / NO

Page: ____ of: ____

5/6-NCF-L1613284 ENRXPFL

R5

Time estimate: oh **Time spent:** oh

Members

Hailey Melson (responsible) JVH John V Hawkins

Due on *10 May 2023 8:00 AM* for target *Done*

- [ ] Parameter(s) past holding time
- [x] Temperature not in range
- [ ] Improper container type
- [ ] pH not in range
- [ ] Insufficient sample volume
- [ ] Sample is biphasic
- [ ] Vials received with headspace
- [ ] Broken container
- [ ] Sufficient sample remains
- [ ] If broken container: Insufficient packing material around container
- [ ] If broken container: Insufficient packing material inside cooler
- [ ] If broken container: Improper handling by carrier:_____
- [ ] If broken container: Sample was frozen
- [ ] If broken container: Container lid not intact
- [ ] Client informed by Call
- [ ] Client informed by Email
- [ ] Client informed by Voicemail
- [x] Date/Time:_5-9-23_____
- [x] PM initials:__JVH_____
- [x] Client Contact:__Lance_____

Comments

Hailey Melson *6 May 2023 10:11 AM*

Samples received with no ICE. Temp = 21.6

John V Hawkins *8 May 2023 8:21 AM*

Porceed with login, these are treatment samples no requiring 4 degrees C

Troy Dunlap *8 May 2023 4:14 PM*

Done.

Appendix E

Advanced Environmental Laboratories, Inc
9610 Princess Palm Ave Tampa, FL 33619
Payments: P.O. Box 551580 Jacksonville, FL 32255-1580
Phone: (813) 630-9616
Fax: (813) 630-4327

FINAL

Workorder: KKA Bench (T2306496)

April 27, 2023

Eric Arenberg
ENRX, Inc.
3218 River Road
Wimauma, FL 33598

RE: Workorder: T2306496 KKA Bench

Dear Eric Arenberg:

Enclosed are the analytical results for sample(s) received by the laboratory on Friday March 31, 2023. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report. The analytical results for the samples contained in this report were submitted for analysis as outlined by the Chain of Custody and results pertain only to these samples.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sue Bell, Sr Project Manager
SBell@aellab.com

Certificate of Analysis

POWERED BY HORIZON v.13.1.0

NELAP Accredited E84589

Advanced Environmental Laboratories, Inc
9610 Princess Palm Ave Tampa, FL 33619
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Phone: (813) 630-9616
Fax: (813) 630-4327

FINAL

Workorder: KKA Bench (T2306496)

Sample Summary

Lab ID	Sample ID	Matrix	Method	Date Collected	Date Received	Analytes Reported	Basis
T2306496001	102	SO	EPA 8081	03/31/2023 13:00	03/31/2023 15:06	19	Dry
T2306496001	102	SO	SM 2540G	03/31/2023 13:00	03/31/2023 15:06	1	Dry
T2306496002	104	SO	EPA 8081	03/31/2023 13:05	03/31/2023 15:06	19	Dry
T2306496002	104	SO	SM 2540G	03/31/2023 13:05	03/31/2023 15:06	1	Dry
T2306496003	HR2	SO	EPA 8081	03/31/2023 13:10	03/31/2023 15:06	19	Dry
T2306496003	HR2	SO	SM 2540G	03/31/2023 13:10	03/31/2023 15:06	1	Dry
T2306496004	WR2	SO	EPA 8081	03/31/2023 13:15	03/31/2023 15:06	19	Dry
T2306496004	WR2	SO	SM 2540G	03/31/2023 13:15	03/31/2023 15:06	1	Dry
T2306496005	302	SO	EPA 8081	03/31/2023 13:20	03/31/2023 15:06	19	Dry
T2306496005	302	SO	SM 2540G	03/31/2023 13:20	03/31/2023 15:06	1	Dry

Certificate of Analysis

NELAP Accredited E84589

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FINAL

Workorder: KKA Bench (T2306496)

Workorder Summary

Batch Comments

GCSt/3237 - 8081/8082/608 Analysis,Soil

The matrix spike recoveries of multiple analytes for T2306380013 were outside control criteria due to matrix interference in the sample. Recovery in the Laboratory Control Sample (LCS) and in the Laboratory Control Sample Duplicate (LCSD) was acceptable, which indicates the analytical batch was in control. The matrix spike outlier suggests a potential bias in this matrix. The affected sample is qualified to indicate matrix interference.

The control criteria for the surrogate in the matrix spikes 4735757, 4735758, and T2306496002, -003, and -004 are not applicable. The chromatogram indicated the presence of high background components that masked the surrogate, which prevented adequate resolution for quantitation. The affected surrogates are qualified to indicate matrix interference.

The sample T2306380013 was diluted prior to instrumental analysis. The extract was highly colored and viscous which indicated the need to perform a dilution prior to injection into the instrument.

Samples in the workorder T2306496 were analyzed at dilution due to high Toxaphene levels. The lowest possible dilution was performed to allow the analyte value to be within the calibration curve's highest level and to prevent possible carry over in the following sample analyses.

Analysis Results Comments

T2306496002 (104) - Decachlorobiphenyl

J4|Estimated Result

T2306496003 (HR2) - Decachlorobiphenyl

J4|Estimated Result

T2306496004 (WR2) - Decachlorobiphenyl

J4|Estimated Result

T2306496004 (WR2) - Tetrachloro-m-xylene

J4|Estimated Result

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Fax: (813) 630-4327

FINAL

Workorder: KKA Bench (T2306496)

Analytical Results Qualifiers

Parameter Qualifiers

U	The compound was analyzed for but not detected.
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

Lab Qualifiers

T	DOH Certification #E84589 (FL NELAC) AEL-Tampa

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FINAL

Workorder: KKA Bench (T2306496)

Analytical Results

Lab ID: T2306496001 **Date Collected:** 03/31/2023 13:00 **Matrix:** Soil
Sample ID: 102 **Date Received:** 03/31/2023 15:06

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
SEMIVOLATILES (SW-846 3550B/EPA 8081)								
4,4`-DDD	0.12 U	mg/Kg	2.3	0.12	1000	04/05/2023 09:15	04/24/2023 14:31	T
4,4`-DDE	0.62 U	mg/Kg	2.3	0.62	1000	04/05/2023 09:15	04/24/2023 14:31	T
4,4`-DDT	0.62 U	mg/Kg	2.3	0.62	1000	04/05/2023 09:15	04/24/2023 14:31	T
Aldrin	0.58 U	mg/Kg	2.3	0.58	1000	04/05/2023 09:15	04/24/2023 14:31	T
Chlordane (technical)	13 U	mg/Kg	23	13	1000	04/05/2023 09:15	04/24/2023 14:31	T
Dieldrin	0.45 U	mg/Kg	0.68	0.45	1000	04/05/2023 09:15	04/24/2023 14:31	T
Endosulfan I	0.50 U	mg/Kg	2.3	0.50	1000	04/05/2023 09:15	04/24/2023 14:31	T
Endosulfan II	0.65 U	mg/Kg	2.3	0.65	1000	04/05/2023 09:15	04/24/2023 14:31	T
Endosulfan Sulfate	0.93 U	mg/Kg	2.3	0.93	1000	04/05/2023 09:15	04/24/2023 14:31	T
Endrin	0.60 U	mg/Kg	2.3	0.60	1000	04/05/2023 09:15	04/24/2023 14:31	T
Endrin Aldehyde	1.0 U	mg/Kg	2.3	1.0	1000	04/05/2023 09:15	04/24/2023 14:31	T
Heptachlor	1.5 U	mg/Kg	2.3	1.5	1000	04/05/2023 09:15	04/24/2023 14:31	T
Heptachlor Epoxide	0.70 U	mg/Kg	2.3	0.70	1000	04/05/2023 09:15	04/24/2023 14:31	T
Methoxychlor	0.15 U	mg/Kg	2.3	0.15	1000	04/05/2023 09:15	04/24/2023 14:31	T
Toxaphene	**69**	mg/Kg	23	12	1000	04/05/2023 09:15	04/24/2023 14:31	T
alpha-BHC	0.19 U	mg/Kg	2.3	0.19	1000	04/05/2023 09:15	04/24/2023 14:31	T
beta-BHC	0.82 U	mg/Kg	2.3	0.82	1000	04/05/2023 09:15	04/24/2023 14:31	T
delta-BHC	0.19 U	mg/Kg	2.3	0.19	1000	04/05/2023 09:15	04/24/2023 14:31	T
gamma-BHC (Lindane)	0.66 U	mg/Kg	2.3	0.66	1000	04/05/2023 09:15	04/24/2023 14:31	T
(SM 2540G)								
Percent Moisture	**13**	%	0.0010	0.0010	1	04/03/2023 06:15	04/03/2023 06:15	T

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FINAL

Workorder: KKA Bench (T2306496)

Analytical Results

Surrogates

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Lab
Decachlorobiphenyl (S)	ug/Kg	20	24	120	63 - 130	T
Tetrachloro-m-xylene (S)	ug/Kg	40	36	90	42 - 129	T

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Workorder: KKA Bench (T2306496)

Analytical Results

Lab ID: T2306496002 **Date Collected:** 03/31/2023 13:05 **Matrix:** Soil
Sample ID: 104 **Date Received:** 03/31/2023 15:06

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
SEMIVOLATILES (SW-846 3550B/EPA 8081)								
4,4`-DDD	0.048 U	mg/Kg	0.90	0.048	400	04/05/2023 09:15	04/23/2023 19:02	T
4,4`-DDE	0.25 U	mg/Kg	0.90	0.25	400	04/05/2023 09:15	04/23/2023 19:02	T
4,4`-DDT	0.25 U	mg/Kg	0.90	0.25	400	04/05/2023 09:15	04/23/2023 19:02	T
Aldrin	0.23 U	mg/Kg	0.90	0.23	400	04/05/2023 09:15	04/23/2023 19:02	T
Chlordane (technical)	5.0 U	mg/Kg	9.0	5.0	400	04/05/2023 09:15	04/23/2023 19:02	T
Dieldrin	0.18 U	mg/Kg	0.27	0.18	400	04/05/2023 09:15	04/23/2023 19:02	T
Endosulfan I	0.20 U	mg/Kg	0.90	0.20	400	04/05/2023 09:15	04/23/2023 19:02	T
Endosulfan II	0.26 U	mg/Kg	0.90	0.26	400	04/05/2023 09:15	04/23/2023 19:02	T
Endosulfan Sulfate	0.37 U	mg/Kg	0.90	0.37	400	04/05/2023 09:15	04/23/2023 19:02	T
Endrin	0.24 U	mg/Kg	0.90	0.24	400	04/05/2023 09:15	04/23/2023 19:02	T
Endrin Aldehyde	0.40 U	mg/Kg	0.90	0.40	400	04/05/2023 09:15	04/23/2023 19:02	T
Heptachlor	0.59 U	mg/Kg	0.90	0.59	400	04/05/2023 09:15	04/23/2023 19:02	T
Heptachlor Epoxide	0.28 U	mg/Kg	0.90	0.28	400	04/05/2023 09:15	04/23/2023 19:02	T
Methoxychlor	0.059 U	mg/Kg	0.90	0.059	400	04/05/2023 09:15	04/23/2023 19:02	T
Toxaphene	**35**	mg/Kg	9.0	4.9	400	04/05/2023 09:15	04/23/2023 19:02	T
alpha-BHC	0.073 U	mg/Kg	0.90	0.073	400	04/05/2023 09:15	04/23/2023 19:02	T
beta-BHC	0.33 U	mg/Kg	0.90	0.33	400	04/05/2023 09:15	04/23/2023 19:02	T
delta-BHC	0.075 U	mg/Kg	0.90	0.075	400	04/05/2023 09:15	04/23/2023 19:02	T
gamma-BHC (Lindane)	0.26 U	mg/Kg	0.90	0.26	400	04/05/2023 09:15	04/23/2023 19:02	T
(SM 2540G)								
Percent Moisture	**11**	%	0.0010	0.0010	1	04/03/2023 06:15	04/03/2023 06:15	T

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Workorder: KKA Bench (T2306496)

Analytical Results

Surrogates

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Lab
Decachlorobiphenyl (S)	ug/Kg	20	29	**144**	63 - 130	T
Tetrachloro-m-xylene (S)	ug/Kg	40	46	116	42 - 129	T

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Workorder: KKA Bench (T2306496)

Analytical Results

Lab ID: T2306496003 **Date Collected:** 03/31/2023 13:10 **Matrix:** Soil
Sample ID: HR2 **Date Received:** 03/31/2023 15:06

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
SEMIVOLATILES (SW-846 3550B/EPA 8081)								
4,4`-DDD	0.024 U	mg/Kg	0.44	0.024	200	04/05/2023 09:15	04/23/2023 18:13	T
4,4`-DDE	0.12 U	mg/Kg	0.44	0.12	200	04/05/2023 09:15	04/23/2023 18:13	T
4,4`-DDT	0.12 U	mg/Kg	0.44	0.12	200	04/05/2023 09:15	04/23/2023 18:13	T
Aldrin	0.11 U	mg/Kg	0.44	0.11	200	04/05/2023 09:15	04/23/2023 18:13	T
Chlordane (technical)	2.4 U	mg/Kg	4.4	2.4	200	04/05/2023 09:15	04/23/2023 18:13	T
Dieldrin	0.087 U	mg/Kg	0.13	0.087	200	04/05/2023 09:15	04/23/2023 18:13	T
Endosulfan I	0.097 U	mg/Kg	0.44	0.097	200	04/05/2023 09:15	04/23/2023 18:13	T
Endosulfan II	0.12 U	mg/Kg	0.44	0.12	200	04/05/2023 09:15	04/23/2023 18:13	T
Endosulfan Sulfate	0.18 U	mg/Kg	0.44	0.18	200	04/05/2023 09:15	04/23/2023 18:13	T
Endrin	0.11 U	mg/Kg	0.44	0.11	200	04/05/2023 09:15	04/23/2023 18:13	T
Endrin Aldehyde	0.20 U	mg/Kg	0.44	0.20	200	04/05/2023 09:15	04/23/2023 18:13	T
Heptachlor	0.29 U	mg/Kg	0.44	0.29	200	04/05/2023 09:15	04/23/2023 18:13	T
Heptachlor Epoxide	0.13 U	mg/Kg	0.44	0.13	200	04/05/2023 09:15	04/23/2023 18:13	T
Methoxychlor	0.029 U	mg/Kg	0.44	0.029	200	04/05/2023 09:15	04/23/2023 18:13	T
Toxaphene	**17**	mg/Kg	4.4	2.4	200	04/05/2023 09:15	04/23/2023 18:13	T
alpha-BHC	0.036 U	mg/Kg	0.44	0.036	200	04/05/2023 09:15	04/23/2023 18:13	T
beta-BHC	0.16 U	mg/Kg	0.44	0.16	200	04/05/2023 09:15	04/23/2023 18:13	T
delta-BHC	0.037 U	mg/Kg	0.44	0.037	200	04/05/2023 09:15	04/23/2023 18:13	T
gamma-BHC (Lindane)	0.13 U	mg/Kg	0.44	0.13	200	04/05/2023 09:15	04/23/2023 18:13	T
(SM 2540G)								
Percent Moisture	**9.5**	%	0.0010	0.0010	1	04/03/2023 06:15	04/03/2023 06:15	T

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Workorder: KKA Bench (T2306496)

Analytical Results

Surrogates

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Lab
Decachlorobiphenyl (S)	ug/Kg	20	36	**184**	63 - 130	T
Tetrachloro-m-xylene (S)	ug/Kg	39	45	114	42 - 129	T

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Workorder: KKA Bench (T2306496)

Analytical Results

Lab ID: T2306496004 **Date Collected:** 03/31/2023 13:15 **Matrix:** Soil
Sample ID: WR2 **Date Received:** 03/31/2023 15:06

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
SEMIVOLATILES (SW-846 3550B/EPA 8081)								
4,4`-DDD	0.54 U	mg/Kg	10	0.54	5000	04/05/2023 09:15	04/26/2023 18:54	T
4,4`-DDE	2.8 U	mg/Kg	10	2.8	5000	04/05/2023 09:15	04/26/2023 18:54	T
4,4`-DDT	2.8 U	mg/Kg	10	2.8	5000	04/05/2023 09:15	04/26/2023 18:54	T
Aldrin	2.6 U	mg/Kg	10	2.6	5000	04/05/2023 09:15	04/26/2023 18:54	T
Chlordane (technical)	56 U	mg/Kg	100	56	5000	04/05/2023 09:15	04/26/2023 18:54	T
Dieldrin	2.0 U	mg/Kg	3.0	2.0	5000	04/05/2023 09:15	04/26/2023 18:54	T
Endosulfan I	2.2 U	mg/Kg	10	2.2	5000	04/05/2023 09:15	04/26/2023 18:54	T
Endosulfan II	2.9 U	mg/Kg	10	2.9	5000	04/05/2023 09:15	04/26/2023 18:54	T
Endosulfan Sulfate	4.1 U	mg/Kg	10	4.1	5000	04/05/2023 09:15	04/26/2023 18:54	T
Endrin	2.7 U	mg/Kg	10	2.7	5000	04/05/2023 09:15	04/26/2023 18:54	T
Endrin Aldehyde	4.5 U	mg/Kg	10	4.5	5000	04/05/2023 09:15	04/26/2023 18:54	T
Heptachlor	6.6 U	mg/Kg	10	6.6	5000	04/05/2023 09:15	04/26/2023 18:54	T
Heptachlor Epoxide	3.1 U	mg/Kg	10	3.1	5000	04/05/2023 09:15	04/26/2023 18:54	T
Methoxychlor	0.67 U	mg/Kg	10	0.67	5000	04/05/2023 09:15	04/26/2023 18:54	T
Toxaphene	**390**	mg/Kg	100	55	5000	04/05/2023 09:15	04/26/2023 18:54	T
alpha-BHC	0.83 U	mg/Kg	10	0.83	5000	04/05/2023 09:15	04/26/2023 18:54	T
beta-BHC	3.7 U	mg/Kg	10	3.7	5000	04/05/2023 09:15	04/26/2023 18:54	T
delta-BHC	0.85 U	mg/Kg	10	0.85	5000	04/05/2023 09:15	04/26/2023 18:54	T
gamma-BHC (Lindane)	3.0 U	mg/Kg	10	3.0	5000	04/05/2023 09:15	04/26/2023 18:54	T
(SM 2540G)								
Percent Moisture	**1.0**	%	0.0010	0.0010	1	04/03/2023 06:15	04/03/2023 06:15	T

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Workorder: KKA Bench (T2306496)

Analytical Results

Surrogates

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Lab
Decachlorobiphenyl (S)	ug/Kg	20	940	**4700**	63 - 130	T
Tetrachloro-m-xylene (S)	ug/Kg	40	440	**1100**	42 - 129	T

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Workorder: KKA Bench (T2306496)

Analytical Results

Lab ID: T2306496005 **Date Collected:** 03/31/2023 13:20 **Matrix:** Soil
Sample ID: 302 **Date Received:** 03/31/2023 15:06

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
SEMIVOLATILES (SW-846 3550B/EPA 8081)								
4,4`-DDD	0.13 U	mg/Kg	2.4	0.13	1000	04/05/2023 09:15	04/24/2023 14:47	T
4,4`-DDE	0.65 U	mg/Kg	2.4	0.65	1000	04/05/2023 09:15	04/24/2023 14:47	T
4,4`-DDT	0.65 U	mg/Kg	2.4	0.65	1000	04/05/2023 09:15	04/24/2023 14:47	T
Aldrin	0.61 U	mg/Kg	2.4	0.61	1000	04/05/2023 09:15	04/24/2023 14:47	T
Chlordane (technical)	13 U	mg/Kg	24	13	1000	04/05/2023 09:15	04/24/2023 14:47	T
Dieldrin	0.47 U	mg/Kg	0.71	0.47	1000	04/05/2023 09:15	04/24/2023 14:47	T
Endosulfan I	0.53 U	mg/Kg	2.4	0.53	1000	04/05/2023 09:15	04/24/2023 14:47	T
Endosulfan II	0.68 U	mg/Kg	2.4	0.68	1000	04/05/2023 09:15	04/24/2023 14:47	T
Endosulfan Sulfate	0.97 U	mg/Kg	2.4	0.97	1000	04/05/2023 09:15	04/24/2023 14:47	T
Endrin	0.63 U	mg/Kg	2.4	0.63	1000	04/05/2023 09:15	04/24/2023 14:47	T
Endrin Aldehyde	1.1 U	mg/Kg	2.4	1.1	1000	04/05/2023 09:15	04/24/2023 14:47	T
Heptachlor	1.6 U	mg/Kg	2.4	1.6	1000	04/05/2023 09:15	04/24/2023 14:47	T
Heptachlor Epoxide	0.73 U	mg/Kg	2.4	0.73	1000	04/05/2023 09:15	04/24/2023 14:47	T
Methoxychlor	0.16 U	mg/Kg	2.4	0.16	1000	04/05/2023 09:15	04/24/2023 14:47	T
Toxaphene	**89**	mg/Kg	24	13	1000	04/05/2023 09:15	04/24/2023 14:47	T
alpha-BHC	0.19 U	mg/Kg	2.4	0.19	1000	04/05/2023 09:15	04/24/2023 14:47	T
beta-BHC	0.86 U	mg/Kg	2.4	0.86	1000	04/05/2023 09:15	04/24/2023 14:47	T
delta-BHC	0.20 U	mg/Kg	2.4	0.20	1000	04/05/2023 09:15	04/24/2023 14:47	T
gamma-BHC (Lindane)	0.70 U	mg/Kg	2.4	0.70	1000	04/05/2023 09:15	04/24/2023 14:47	T
(SM 2540G)								
Percent Moisture	**17**	%	0.0010	0.0010	1	04/03/2023 06:15	04/03/2023 06:15	T

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Workorder: KKA Bench (T2306496)

Analytical Results

Surrogates

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Lab
Decachlorobiphenyl (S)	ug/Kg	20	20	100	63 - 130	T
Tetrachloro-m-xylene (S)	ug/Kg	39	35	90	42 - 129	T

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Workorder: KKA Bench (T2306496)

QC Results

QC Batch: GCSt/3237 **Analysis Method:** EPA 8081
Preparation Method: SW-846 3550B
Associated Lab IDs: T2306496001, T2306496002, T2306496003, T2306496004, T2306496005

Method Blank(4735755)

Parameter	Results	Units	PQL	MDL	Lab
alpha-BHC	0.00016 U	mg/Kg	0.0020	0.00016	T
gamma-BHC (Lindane)	0.00059 U	mg/Kg	0.0020	0.00059	T
beta-BHC	0.00073 U	mg/Kg	0.0020	0.00073	T
delta-BHC	0.00017 U	mg/Kg	0.0020	0.00017	T
Heptachlor	0.0013 U	mg/Kg	0.0020	0.0013	T
Aldrin	0.00051 U	mg/Kg	0.0020	0.00051	T
Heptachlor Epoxide	0.00062 U	mg/Kg	0.0020	0.00062	T
Endosulfan I	0.00044 U	mg/Kg	0.0020	0.00044	T
4,4`-DDE	0.00055 U	mg/Kg	0.0020	0.00055	T
Dieldrin	0.00040 U	mg/Kg	0.00060	0.00040	T
Endrin	0.00053 U	mg/Kg	0.0020	0.00053	T
4,4`-DDD	0.00011 U	mg/Kg	0.0020	0.00011	T
Endosulfan II	0.00057 U	mg/Kg	0.0020	0.00057	T
Endrin Aldehyde	0.00090 U	mg/Kg	0.0020	0.00090	T
4,4`-DDT	0.00055 U	mg/Kg	0.0020	0.00055	T
Endosulfan Sulfate	0.00082 U	mg/Kg	0.0020	0.00082	T
Methoxychlor	0.00013 U	mg/Kg	0.0020	0.00013	T
Chlordane (technical)	0.011 U	mg/Kg	0.020	0.011	T
Toxaphene	0.011 U	mg/Kg	0.020	0.011	T

Surrogates

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Lab
Decachlorobiphenyl (S)	mg/L	0.02	0.0170	83	63 - 130	T
Tetrachloro-m-xylene (S)	mg/L	0.04	0.0340	85	42 - 129	T

Lab Control Sample (4735756)

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Lab
alpha-BHC	mg/Kg	0.0040	.003	76	45 - 137	T
gamma-BHC (Lindane)	mg/Kg	0.0040	.003	75	49 - 135	T
beta-BHC	mg/Kg	0.0040	.0029	72	50 - 136	T
delta-BHC	mg/Kg	0.0040	.003	75	47 - 139	T

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Workorder: KKA Bench (T2306496)

QC Batch: GCSt/3237 **Analysis Method:** EPA 8081
Preparation Method: SW-846 3550B
Associated Lab IDs: T2306496001, T2306496002, T2306496003, T2306496004, T2306496005

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Lab
Heptachlor	mg/Kg	0.0040	.0034	86	47 - 136	T
Aldrin	mg/Kg	0.0040	.0032	79	45 - 136	T
Heptachlor Epoxide	mg/Kg	0.0040	.0031	78	52 - 136	T
Endosulfan I	mg/Kg	0.0040	.0035	87	53 - 132	T
4,4`-DDE	mg/Kg	0.0040	.003	75	56 - 134	T
Dieldrin	mg/Kg	0.0040	.0031	77	56 - 136	T
Endrin	mg/Kg	0.0040	.0031	77	57 - 140	T
4,4`-DDD	mg/Kg	0.0040	.0033	82	56 - 139	T
Endosulfan II	mg/Kg	0.0040	.0033	82	53 - 134	T
Endrin Aldehyde	mg/Kg	0.0040	.0039	99	35 - 137	T
4,4`-DDT	mg/Kg	0.0040	.0035	88	50 - 141	T
Endosulfan Sulfate	mg/Kg	0.0040	.0032	79	55 - 136	T
Methoxychlor	mg/Kg	0.0040	.0032	80	52 - 143	T

Surrogates

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Lab
Decachlorobiphenyl (S)	mg/L	0.02	0.0170	83	63 - 130	T
Tetrachloro-m-xylene (S)	mg/L	0.04	0.0340	86	42 - 129	T

Matrix Spike (4735757); Matrix Spike Duplicate (4735758); Parent Lab Sample (T2306380013)

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Dup Result	Dup Recovery	RPD	RPD Limit	Lab
alpha-BHC	mg/Kg	0.0040	.0051	128	45 - 137	.0053	132	4	30	T
gamma-BHC (Lindane)	mg/Kg	0.0040	.0044	110	49 - 135	.045	**1120**	**164**	30	T
beta-BHC	mg/Kg	0.0040	.0019	**48**	50 - 136	.0021	52	9	30	T
delta-BHC	mg/Kg	0.0040	.0063	**160**	47 - 139	.0069	**174**	9	30	T
Heptachlor	mg/Kg	0.0040	.0021	52	47 - 136	.0024	60	15	30	T
Aldrin	mg/Kg	0.0040	.0041	104	45 - 136	.0045	112	8	30	T
Heptachlor Epoxide	mg/Kg	0.0040	.0078	**196**	52 - 136	.0059	**148**	27	30	T
Endosulfan I	mg/Kg	0.0040	.0066	**166**	53 - 132	.0076	**190**	14	30	T
4,4`-DDE	mg/Kg	0.0040	.0019	**48**	56 - 134	.0022	56	16	30	T
Dieldrin	mg/Kg	0.0040	.0052	132	56 - 136	.0057	**142**	8	30	T
Endrin	mg/Kg	0.0040	.0021	**52**	57 - 140	.0021	**52**	1	30	T
4,4`-DDD	mg/Kg	0.0040	.0024	60	56 - 139	.0026	64	7	30	T
Endosulfan II	mg/Kg	0.0040	.0045	114	53 - 134	.044	**1100**	**163**	30	T
Endrin Aldehyde	mg/Kg	0.0040	.00055	**14**	35 - 137	.00008	**2**	**150**	30	T

Certificate of Analysis

NELAP Accredited E84589

Advanced Environmental Laboratories, Inc
9610 Princess Palm Ave Tampa, FL 33619
Payments: P.O. Box 551580 Jacksonville, FL 32255-1580
Phone: (813) 630-9616
Fax: (813) 630-4327

FINAL

Workorder: KKA Bench (T2306496)

QC Batch: GCSt/3237 **Analysis Method:** EPA 8081
Preparation Method: SW-846 3550B
Associated Lab IDs: T2306496001, T2306496002, T2306496003, T2306496004, T2306496005

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Dup Result	Dup Recovery	RPD	RPD Limit	Lab
4,4`-DDT	mg/Kg	0.0040	.0026	66	50 - 141	.0026	64	2	30	T
Endosulfan Sulfate	mg/Kg	0.0040	.0036	92	55 - 136	.0057	**144**	**45**	30	T
Methoxychlor	mg/Kg	0.0040	.005	126	52 - 143	.0044	110	13	30	T

Surrogates

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Dup Result	Dup Recovery	RPD	RPD Limit	Lab
Decachlorobiphenyl (S)	mg/L	0.02	0.0270	**135**	63 - 130	0.0280	140	5		T
Tetrachloro-m-xylene (S)	mg/L	0.04	0.05	126	42 - 129	0.0520	130	3		T

QC Result Comments

Matrix Spike - 4735757 - 4,4`-DDE
J4|Estimated Result
Matrix Spike - 4735757 - Endosulfan I
J4|Estimated Result
Matrix Spike - 4735757 - Endrin
J4|Estimated Result
Matrix Spike - 4735757 - Endrin Aldehyde
J4|Estimated Result
Matrix Spike - 4735757 - Heptachlor Epoxide
J4|Estimated Result
Matrix Spike - 4735757 - beta-BHC
J4|Estimated Result
Matrix Spike - 4735757 - delta-BHC
J4|Estimated Result
Matrix Spike Duplicate - 4735758 - Dieldrin
J4|Estimated Result
Matrix Spike Duplicate - 4735758 - Endosulfan I
J4|Estimated Result
Matrix Spike Duplicate - 4735758 - Endosulfan II
J4|Estimated Result
Matrix Spike Duplicate - 4735758 - Endosulfan Sulfate
J4|Estimated Result

Certificate of Analysis

NELAP Accredited E84589

Advanced Environmental Laboratories, Inc
9610 Princess Palm Ave Tampa, FL 33619
Payments: P.O. Box 551580 Jacksonville, FL 32255-1580
Phone: (813) 630-9616
Fax: (813) 630-4327

FINAL

Workorder: KKA Bench (T2306496)

QC Result Comments

Matrix Spike Duplicate - 4735758 - Endrin

J4|Estimated Result

Matrix Spike Duplicate - 4735758 - Endrin Aldehyde

J4|Estimated Result

Matrix Spike Duplicate - 4735758 - Heptachlor Epoxide

J4|Estimated Result

Matrix Spike Duplicate - 4735758 - delta-BHC

J4|Estimated Result

Matrix Spike Duplicate - 4735758 - gamma-BHC (Lindane)

J4|Estimated Result

Certificate of Analysis

NELAP Accredited E84589

Advanced Environmental Laboratories, Inc
9610 Princess Palm Ave Tampa, FL 33619
Payments: P.O. Box 551580 Jacksonville, FL 32255-1580
Phone: (813) 630-9616
Fax: (813) 630-4327

FINAL

Workorder: KKA Bench (T2306496)

QC Cross Reference

Lab ID	Sample ID	Prep Batch	Prep Method
GCSt/3237 - EPA 8081			
T2306496001	102	EXTt/4015	SW-846 3550B
T2306496002	104	EXTt/4015	SW-846 3550B
T2306496003	HR2	EXTt/4015	SW-846 3550B
T2306496004	WR2	EXTt/4015	SW-846 3550B
T2306496005	302	EXTt/4015	SW-846 3550B
WCAt/19654 - SM 2540G			
T2306496001	102		
T2306496002	104		
T2306496003	HR2		
T2306496004	WR2		
T2306496005	302		

Certificate of Analysis

NELAP Accredited E84589

Advanced Environmental Laboratories, Inc
9610 Princess Palm Ave Tampa, FL 33619
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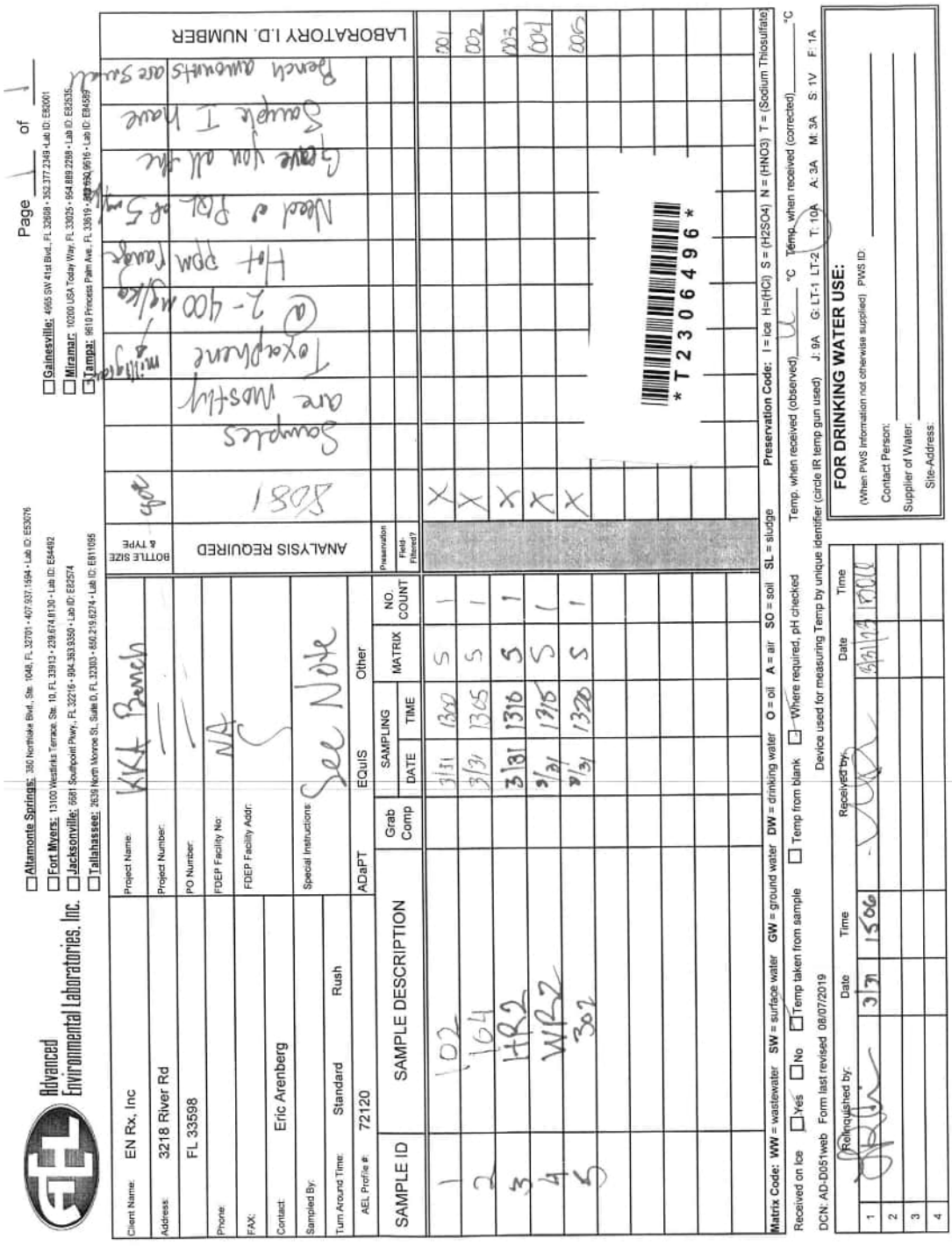
Phone: (813) 630-9616
Fax: (813) 630-4327

FINAL

Workorder: KKA Bench (T2306496)



Certificate of Analysis

POWERED BY HORIZON v.13.1.0

NELAP Accredited E84589

APPENDIX

I EN RX PRODUCT SAFETY DATA SHEETS

Safety Data Sheet

SSO

COMPANY IDENTIFICATION

Company Name	EN Rx, Inc. PO Box 270586 Flower Mound, TX 75027
Phone Number	(832) 250-1700
Effective Date	September 5, 2006
Trade Name	SSO
Chemical Family	Oxidizing solid, n.o.s.
Components:	Proprietary Blend

HAZARDS IDENTIFICATION

1	HMIS HEALTH
0	HMIS FLAMMABILITY
1	HMIS REACTIVITY
F	HMIS PERSONAL PROTECTION

INGREDIENT COMPOSITION

Trade Name	SSO
Chemical Family	Oxidizing solid, n.o.s.
Components:	Proprietary Blend

FIRST AID

Skin: Wash with soap and water. Brush off and remove contaminated clothing.
Eyes: Immediately flush with fresh water for at least 15 minutes; seek medical attention.
Ingestion: Drink large amounts of water to dilute; seek medical attention. Do not induce vomiting.
Inhalation: Leave contaminated area immediately; breathe fresh air

FIRE AND EXPLOSION HAZARD DATA

Flash Point: N/A
Upper Flame Limit: N/A
Extinguishing Media: Water
Upper Flame Limit: N/A
Special Firefighting Procedures: Wear self-contained breathing apparatus and full protective gear.
Unusual Firefighting Hazard: Oxidizer. Damp SSO in contact with paper, wood, cloth, etc. may cause spontaneous combustion of the organic material. Oxygen evolution as a result of decomposition may burst sealed containers and accelerate the burning rates of other combustible materials.

ACCIDENTAL RELEASE PROCEDURES

For spills:	Sweep up. Do not return to original container. Bag spill in clean dry plastic bags. Small amounts may be flushed to drain with water. Comply with Federal, State and Local regulations on reporting spills. Do not mix with absorbents containing hydrocarbons.
Waste disposal method:	In an approved waste facility by an authorized contractor.
Environmental hazards:	None

Safety Data Sheet

SSO

HANDLING AND STORAGE

Store in a cool dry ventilated area in the original shipping container.

EXPOSURE CONTROLS / PERSONAL PROTECTION

Eye protection: Wear adequate eye protection.
Respiratory protection: Wear dust mask.
Ventilation: Maintain adequate ventilation in working area.
Protective gloves: Rubber gloves.
Other protective equipment: Water source and safety / eyewash should be located close to location where material is stored. Wear approved industrial footwear.

PHYSICAL DATA

Boiling Point:	N/A	**Available Oxygen:**	17%
Vapor Pressure:	N/A	**Vapor Density:**	N/A
Volatility / Vol. %:	Not Determined	**Sol. in Water:**	15% by Weight @ 75° F
Appearance:	White, Free Flowing Granules	**Odor:**	Odorless
Molecular Weight:		**Melting Point:**	Decomposes @ 212° F
Density:	1 – 1.2 g/cm3	**pH 1% Solution:**	10.5

REACTIVITY

Chemical Stability: Stable in dry state.
Incompatibility: Avoid contact with moisture, acids, reducing agents, excess heat, metal salts, organic materials, heavy metals, oil and greases. Excessive heat and moisture should be avoided. Contamination with acids, reducing agents, and metallic ions may cause catalytic decomposition.
Decomposition products: Decomposition liberates oxygen and generates heat. Decomposition in the presence of organic materials is rapid and highly exothermic.
Hazardous polymerization: Will not occur.

TOXICOLOGICAL INFORMATION

Threshold Limit Value: 10 mg / m3 per 40 hour week
Health Hazard: Exposure to skin or eyes may cause irritation. Inhalation of dust may cause irritation to the mucous and respiratory system. SSO is a severe eye irritant. 1% aqueous solution is non-irritating.
Irritation Data: Primary skin irritation (powder) – mild irritant
Primary eye irritation (powder) – severe irritant
Toxicity Data: Oral LD_{50} – 2,000 mg / kg (rat)
Inhalation LC_{50} – 4.58 mg / l (rat)
Not an NTP, IARC, or OSHA listed carcinogen or probable carcinogen

DISPOSAL INFORMATION

For spills: Sweep up. Do not return to original container. Bag spill in clean dry plastic bags. Small amounts may be flushed to drain with water. Comply with Federal, State and Local regulations on reporting spills. Do not mix with absorbents containing hydrocarbons.
Waste disposal method: In an approved waste facility by an authorized contractor.
Environmental hazards: None

Safety Data Sheet

SSO

TRANSPORTATION & DOT

Handling and storage: Store in a cool dry ventilated area in the original shipping container.
UN Number: 1479 **Class:** 70
NMFC: 44157-03
DOT hazard class: 5.1 (Oxidizer)
DOT shipping name: Oxidizing solid, n.o.s.
Packaging size: 50, 400, and 2,000 lb containers.

Trade name: SSO **Signal word:** WARNING
Statement of hazard: Causes irritation **DOT label required:** 5.1 (Oxidizer)

SPECIAL NOTICE

Special Notice: In accordance with 40 CFR 372.45, this product contains the following materials, which have been classified as TOXIC under SARA Title III Section 313. This page is a part of the Material Safety Data Sheet describing the above product and shall not be detached. Any reproduction or distribution of this Material Safety Data sheet after January 1, 1989, must include this page.

REGULATORY / SARA TITLE III SECTION 313

Toxic chemicals: None

Prepared by: Erik R. Piatt **Revision Date:** May 28, 2016

This product's health and safety information is provided to assist our customers in assessing compliance with Health, Safety and Environmental regulations. The information contained herein is based on data available to us, and is believed to be accurate, although no guarantee or warranty is provided or implied by the company in this respect. Since the use of this product is within the exclusive control of the user, it is the user's responsibility to determine the conditions of safe use. Such conditions must comply with all governmental regulations.

OTHER ENVIRONMENTAL DATA

EPA hazard: None

CERCLA RQ value: None

SARA TPQ: None

SARA RQ: None

RCRA hazardous waste: D001 (Ignitable)

Clean air: None

Clean water: None

Safety Data Sheet

Synergist D

COMPANY & PRODUCT IDENTIFICATION

Company Name	EN Rx, Inc. PO Box 270586 Flower Mound, TX 75027
Phone Number	(832) 250-1700
Effective Date	September 5, 2006
Trade Name	Synergist D
Components:	Proprietary Blend

HAZARD IDENTIFICATION

1	HMIS HEALTH
0	HMIS FLAMMABILITY
1	HMIS REACTIVITY
F	HMIS PERSONAL PROTECTION

COMPOSITION

Components: Proprietary Compound

FIRST AID MEASURES

First Aid: Eye Contact - Immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.
Skin Contact - Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash clothing before reuse.
Inhalation - Remove to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
Ingestion - Do not induce vomiting. Give large quantities of water. Call a physician. Never give anything by mouth to an unconscious person.

FIRE FIGHTING MEASURES

Flammable Properties: Will not burn.
Fire and Explosion Hazards: None.
Extinguishing Media: As appropriate for combustibles in area.
Fire Fighting Instructions: None

ACCIDENTAL RELEASE MEASURES

SAFEGUARDS (Personnel): NOTE: Review FIRE FIGHTING MEASURES AND HANDLING (Personnel) sections before proceeding with clean up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean up.
Accidental Release: Neutralize spills with lime or soda ash. Flush spill area with plenty of water.

Safety Data Sheet

Synergist D

HANDLING AND STORAGE

Handling (Personnel): Avoid breathing dust. Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling.

Storage: Keep in a well-ventilated area. Protect bulk storage area from sparks and flame. Keep packages tightly closed.

EXPOSURE CONTROLS & PERSONAL PROTECTION

Engineering Controls: Respirator with dust filter if exposure limits may be exceeded.
Personal Protective Equipment: Chemical splash goggles and rubber gloves. Wear a butyl rubber acid suit and NIOSH permissible respiratory protection if there is a reasonable possibility for exposure.
Exposure Guidelines (Exposure Limits): Synergist
PEL (OSHA) None established TLV (ACGIH) None Established
Potential Health Effects: This compound may cause burns and ulceration of the eyes, and is a severe skin irritant. Prolonged exposure may cause skin burns and ulceration. Inhalation may cause nose, throat, and lung irritation. Ingestion may cause burns and/or perforation of the gastrointestinal tract.
Gross overexposure may result in death.
Human Health Effects: Eye contact may cause eye corrosion with corneal or conjunctival ulceration. Skin contact may cause skin irritation with discomfort or rash. Higher or prolonged skin irritation may cause burns or ulceration. Inhalation may cause irritation of the respiratory passages with cough, difficulty in breathing and bronchial irritation. Ingestion may cause irritation of the gastrointestinal tract with abdominal pain, nausea, vomiting, diarrhea, and abnormal kidney function. Ingestion may also cause corrosion of mucous membranes with stomach discomfort, nausea, and prostration. Individuals with preexisting diseases of the skin, kidneys, or reproductive system may have increased susceptibility to the toxicity of excessive exposure.
Carcinogenicity Information: None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA, or ACGIH as a carcinogen.

PHYSICAL & CHEMICAL PROPERTIES

Boiling Point: 209ºC **Sp. Gr.:** 2.126 g/cc at 26ºC (79ºF) **Sol. in Water:** Miscible **Form:** White Chrystalline Solid
Odor: Slight **pH:** 1.18 @ 25ºC (77ºF)

STABILITY & REACTIVITY

Chemical Stability: Stable **Decomposition:** Will not occur
Polymerization: Will not occur **Other Hazards:** Incompatibility: Hazardous reaction in aqueous solution may occur with chlorine, hypochlorous acid, hypochlorites, cyanides, nitric acid, or sulfides.

TOXICOLOGICAL

Animal Data: Synergist
Inhalation 4 hour LC50: 7.7 mg/L in rats
Oral LD50: 4,240 mg/kg in rats
The compound is a skin and eye corrosive, but is not a skin sensitizer in animals.
Toxic effects described in animals from a single exposure by inhalation include body weight losses, ocular and nasal discharges, and other nonspecific effects. Repeated inhalation exposures produced liver, spleen, and thymus changes, and gastrointestinal tract alterations. By ingestion, the administration of single high oral doses produced severe gastrointestinal tract irritation, liver damage, increased kidney weights, and the formation of dosing in cats produced weight and appetite loss, depression, vomiting, coma, convulsions,

kidney failure due to calcium oxalate deposition, and death. Dogs given similar and higher doses exhibited no toxic effects. Long-term dosing in male and female rats exhibited no toxic effects.
At a high dietary level, a reduced number of offspring were observed in rats, but this effect occurred only at a maternally toxic dose. In a developmental toxicity study, fetal abnormalities were indicated in rats orally dosed during gestation with Synergist at levels that also produced maternal toxicity. The compound does not produce genetic damage in bacteria cell cultures.

ECOLOGICAL INFORMATION

Ecotoxicological Information: Aquatic Toxicity - Slight
24-48 hour LC50, bluegill sunfish: 93mg/L
96 hour LC50, fathead minnows: 164 mg/L
These data indicate that Synergist has slight aquatic toxicity.
Biodegradability - Readily biodegradable. After 7 days, 89.6% is biodegraded (closed bottle test).

DISPOSAL CONSIDERATIONS

Waste Disposal: Comply with Federal, State, local regulations. If approved, may be neutralized with lime or soda ash and flushed to wastewater treatment system. This material may be a RCRA hazardous waste due to its corrosive characteristic (pH).

TRANSPORTATION INFORMATION

Shipping Information: DOT/IMO
Proper Shipping name: Corrosive Solids, Acid
Class: 85
Hazard Class: 8
UN #: 3260
DOT/IMO: Corrosive Packing Group: III
NMFC# 43940-02 Shipping Containers: 50 and 400 lb Containers

FEDERAL REGULATORY INFORMATION

U.S. Federal Regulations: TSCA Inventory Status Reported/Included
Title III Hazardous Classifications sections 311, 312
Acute: Yes Chronic: No
Fire: No Reactivity: No
Pressure: No
LISTS: SARA Extremely Hazardous Substance - No
CERCLA Hazardous Substance: Yes (see disposal section)
SARA Toxic Chemical: No
CANADIAN WHMIS CLASSIFICATION: E

REGULATORY INFORMATION

NFPA, NPCA-HMIS: NPCA - Rating: Health 1; Flammability 0; Reactivity 1; Personal Protection F

Additional Information: Do not use this product in personal care applications due to the high level of impurities.

This product's health and safety information is provided to assist our customers in assessing compliance with Health, Safety and Environmental regulations. The information contained herein is based on data available to us, and is believed to be accurate, although no guarantee or warranty is provided or implied by the company in this respect. Since the use of this product is within the exclusive control of the user, it is the user's responsibility to determine the conditions of safe use. Such conditions must comply with all governmental regulations.

SAFETY DATA SHEET

Creation Date 16-Jun-2009 **Revision Date** 07-Sep-2023 **Revision Number** 8

1. Identification

Product Name **Sodium hydroxide**

Cat No. : **BP359-500; BP359-212**

CAS No 1310-73-2
Synonyms Caustic soda

Recommended Use Laboratory chemicals.
Uses advised against Food, drug, pesticide or biocidal product use.

Details of the supplier of the safety data sheet

Company
Fisher Scientific Company
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Emergency Telephone Number
CHEMTREC®, Inside the USA: 800-424-9300
CHEMTREC®, Outside the USA: 001-703-527-3887

2. Hazard(s) identification

Classification
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Corrosive to metals	Category 1
Skin Corrosion/Irritation	Category 1 A
Serious Eye Damage/Eye Irritation	Category 1
Specific target organ toxicity (single exposure)	Category 3
Target Organs - Respiratory system.	

Label Elements

Signal Word
Danger

Hazard Statements
May be corrosive to metals
Causes severe skin burns and eye damage
May cause respiratory irritation

Precautionary Statements
Prevention
Do not breathe dust/fume/gas/mist/vapors/spray
Wash face, hands and any exposed skin thoroughly after handling
Wear protective gloves/protective clothing/eye protection/face protection
Use only outdoors or in a well-ventilated area
Keep only in original container
Response
Immediately call a POISON CENTER or doctor/physician
Inhalation
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Skin
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
Wash contaminated clothing before reuse
Eyes
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
Ingestion
IF SWALLOWED: Rinse mouth. DO NOT induce vomiting
Spills
Absorb spillage to prevent material damage
Storage
Store locked up
Store in a well-ventilated place. Keep container tightly closed
Store in corrosive resistant polypropylene container with a resistant inliner
Store in a dry place
Disposal
Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)
None identified

3. Composition/Information on Ingredients

Component	CAS No	Weight %
Sodium hydroxide	1310-73-2	100

4. First-aid measures

General Advice Immediate medical attention is required. Show this safety data sheet to the doctor in attendance.

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Immediate medical attention is required. Keep eye wide open while rinsing.

Skin Contact Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Call a physician immediately.

Inhalation Remove to fresh air. If breathing is difficult, give oxygen. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Call

a physician or poison control center immediately.

Ingestion Do NOT induce vomiting. Immediate medical attention is required. Never give anything by mouth to an unconscious person. Drink plenty of water.

Most important symptoms and effects Causes burns by all exposure routes. . Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation

Notes to Physician Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media Not combustible. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable Extinguishing Media Do not use a solid water stream as it may scatter and spread fire

Flash Point No information available
Method - No information available

Autoignition Temperature No information available
Explosion Limits
Upper No data available
Lower No data available
Sensitivity to Mechanical Impact No information available
Sensitivity to Static Discharge No information available

Specific Hazards Arising from the Chemical
The product causes burns of eyes, skin and mucous membranes. Reacts violently with water. Contact with metals may evolve flammable hydrogen gas.

Hazardous Combustion Products
Hydrogen. Sodium oxides.
Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

NFPA

Health	Flammability	Instability	Physical hazards
3	0	1	N/A

6. Accidental release measures

Personal Precautions Use personal protective equipment as required. Evacuate personnel to safe areas. Avoid contact with skin, eyes or clothing.

Environmental Precautions Do not allow material to contaminate ground water system. Should not be released into the environment. Do not flush into surface water or sanitary sewer system. See Section 12 for additional Ecological Information.

Methods for Containment and Clean Up Avoid dust formation. Sweep up and shovel into suitable containers for disposal.

7. Handling and storage

Handling Wear personal protective equipment/face protection. Use only under a chemical fume hood. Do not get in eyes, on skin, or on clothing. Do not breathe dust. Do not ingest. If swallowed then seek immediate medical assistance.

Storage. Keep containers tightly closed in a dry, cool and well-ventilated place. Corrosives area.

Incompatible Materials. Strong oxidizing agents. Acids. Metals. Water.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH	Mexico OEL (TWA)
Sodium hydroxide	Ceiling: 2 mg/m³	Ceiling: 2 mg/m³ TWA: 2 mg/m³	IDLH: 10 mg/m³ Ceiling: 2 mg/m³	Ceiling: 2 mg/m³

Legend

ACGIH - American Conference of Governmental Industrial Hygienists
OSHA - Occupational Safety and Health Administration
NIOSH: NIOSH - National Institute for Occupational Safety and Health

Engineering Measures Use only under a chemical fume hood. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal Protective Equipment

Eye/face Protection Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Tight sealing safety goggles. Face protection shield.

Skin and body protection Wear appropriate protective gloves and clothing to prevent skin exposure.

Respiratory Protection Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Recommended Filter type: Particulates filter conforming to EN 143.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Solid
Appearance	White
Odor	Odorless
Odor Threshold	No information available
pH	14 (5 %)
Melting Point/Range	318 °C / 604.4 °F
Boiling Point/Range	1390 °C / 2534 °F @ 760 mmHg
Flash Point	No information available
Evaporation Rate	Not applicable
Flammability (solid,gas)	Not flammable
Flammability or explosive limits	
Upper	No data available
Lower	No data available
Vapor Pressure	1 mbar @ 700 °C
Vapor Density	Not applicable
Specific Gravity	No information available
Bulk Density	2.13 g/cm3
Solubility	Soluble in water
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	No information available
Decomposition Temperature	No information available
Viscosity	Not applicable
Molecular Formula	H Na O

Molecular Weight 40

10. Stability and reactivity

Reactive Hazard Yes

Stability Stable under normal conditions.

Conditions to Avoid Incompatible products. Excess heat.

Incompatible Materials Strong oxidizing agents, Acids, Metals, Water

Hazardous Decomposition Products Hydrogen, Sodium oxides

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information
Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Sodium hydroxide	140 - 340 mg/kg (Rat)	1350 mg/kg (Rabbit)	Not listed

Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation Causes severe burns by all exposure routes

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS No	IARC	NTP	ACGIH	OSHA	Mexico
Sodium hydroxide	1310-73-2	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure Respiratory system
STOT - repeated exposure None known

Aspiration hazard No information available

Symptoms / effects,both acute and delayed Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation

Endocrine Disruptor Information No information available

Other Adverse Effects The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity

Do not empty into drains. Large amounts will affect pH and harm aquatic organisms.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Sodium hydroxide	Not listed	LC50: = 45.4 mg/L, 96h static (Oncorhynchus mykiss)	Not listed	Not listed

Persistence and Degradability Soluble in water Persistence is unlikely based on information available.

Bioaccumulation/ Accumulation No information available.

Mobility Will likely be mobile in the environment due to its water solubility.

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

14. Transport information

DOT

UN-No UN1823
Proper Shipping Name SODIUM HYDROXIDE, SOLID
Hazard Class 8
Packing Group II

TDG

UN-No UN1823
Proper Shipping Name SODIUM HYDROXIDE, SOLID
Hazard Class 8
Packing Group II

IATA

UN-No UN1823
Proper Shipping Name Sodium hydroxide, solid
Hazard Class 8
Packing Group II

IMDG/IMO

UN-No UN1823
Proper Shipping Name Sodium hydroxide, solid
Hazard Class 8
Packing Group II

15. Regulatory information

United States of America Inventory

Component	CAS No	TSCA	TSCA Inventory notification - Active-Inactive	TSCA - EPA Regulatory Flags
Sodium hydroxide	1310-73-2	X	ACTIVE	-

Legend:
TSCA US EPA (TSCA) - Toxic Substances Control Act, (40 CFR Part 710)
X - Listed
'-' - Not Listed

TSCA - Per 40 CFR 751, Regulation of Certain Chemical Substances & Mixtures, Under TSCA Section 6(h) (PBT) Not applicable

TSCA 12(b) - Notices of Export Not applicable

International Inventories

Canada (DSL/NDSL), Europe (EINECS/ELINCS/NLP), Philippines (PICCS), Japan (ENCS), Japan (ISHL), Australia (AICS), China (IECSC), Korea (KECL).

Component	CAS No	DSL	NDSL	EINECS	PICCS	ENCS	ISHL	AICS	IECSC	KECL
Sodium hydroxide	1310-73-2	X	-	215-185-5	X	X	X	X	X	KE-31487

KECL - NIER number or KE number (http://ncis.nier.go.kr/en/main.do)

U.S. Federal Regulations

SARA 313 Not applicable

SARA 311/312 Hazard Categories See section 2 for more information

CWA (Clean Water Act)

Component	CWA - Hazardous Substances	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants
Sodium hydroxide	X	1000 lb	-	-

Clean Air Act Not applicable

OSHA - Occupational Safety and Health Administration Not applicable

CERCLA This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Component	Hazardous Substances RQs	CERCLA EHS RQs
Sodium hydroxide	1000 lb	-

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Sodium hydroxide	X	X	X	-	X

U.S. Department of Transportation

Reportable Quantity (RQ): Y
DOT Marine Pollutant N
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade No information available

Authorisation/Restrictions according to EU REACH

Component	CAS No	REACH (1907/2006) - Annex XIV - Substances Subject to Authorization	REACH (1907/2006) - Annex XVII - Restrictions on Certain Dangerous Substances	REACH Regulation (EC 1907/2006) article 59 - Candidate List of Substances of Very High Concern (SVHC)
Sodium hydroxide	1310-73-2	-	Use restricted. See item	-

			75. (see link for restriction details)	

https://echa.europa.eu/substances-restricted-under-reach

Safety, health and environmental regulations/legislation specific for the substance or mixture

Component	CAS No	OECD HPV	Persistent Organic Pollutant	Ozone Depletion Potential	Restriction of Hazardous Substances (RoHS)
Sodium hydroxide	1310-73-2	Listed	Not applicable	Not applicable	Not applicable

Contains component(s) that meet a 'definition' of per & poly fluoroalkyl substance (PFAS)?
Not applicable

Other International Regulations

Component	CAS No	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Major Accident Notification	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Safety Report Requirements	Rotterdam Convention (PIC)	Basel Convention (Hazardous Waste)
Sodium hydroxide	1310-73-2	Not applicable	Not applicable	Not applicable	Annex I - Y35

16. Other information

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Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

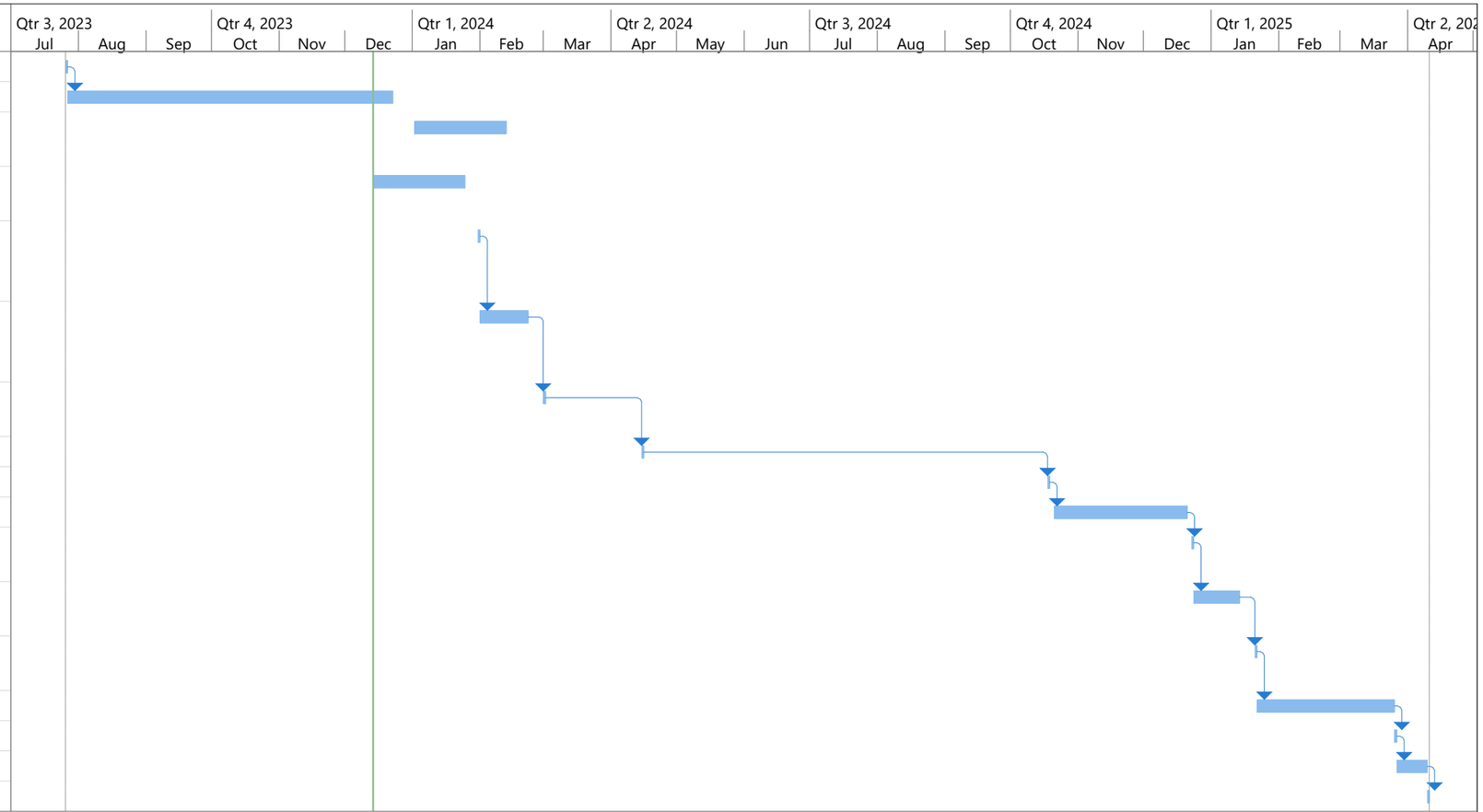
Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of SDS

APPENDIX

J INITIAL SCHEDULE

ID	Task Name	Duration	Start	Finish	Predecessors
1	Submit RAP to VRP	1 day	Wed 7/26/23	Wed 7/26/23	
2	ADEQ Review Period	107 days	Thu 7/27/23	Fri 12/22/23	1
3	Public Comment Period	30 days	Tue 1/2/24	Mon 2/12/24	
4	Prepare Remediation Budget	30 days	Thu 12/14/23	Wed 1/24/24	
5	Submit Remediation Budget to City of Chandler	1 day	Wed 1/31/24	Wed 1/31/24	
6	City of Chandler Council Consideration	16 days	Thu 2/1/24	Thu 2/22/24	5
7	PO Issued by City of Chandler	1 day	Fri 3/1/24	Fri 3/1/24	6FS+5 days
8	Project Initiation	1 day?	Mon 4/15/24	Mon 4/15/24	7FS+30 days
9	Fieldwork Complete	1 day?	Fri 10/18/24	Fri 10/18/24	8FS+133 days
10	Prepare RACR	45 days	Mon 10/21/2	Fri 12/20/24	9
11	SubmitRACR to City of Chandler	1 day?	Mon 12/23/24	Mon 12/23/24	10
12	RACR Review by City of Chandler	15 days	Tue 12/24/24	Mon 1/13/25	11
13	Submit RACR for VRP Review	1 day	Tue 1/21/25	Tue 1/21/25	12FS+5 days
14	VRP Review of RACR	45 days	Wed 1/22/25	Tue 3/25/25	13
15	VRP Approves RACR	1 day?	Wed 3/26/25	Wed 3/26/25	14
16	Prepare NFA Report	10 days	Thu 3/27/25	Wed 4/9/25	15
17	Submit NFA Report	1 day?	Thu 4/10/25	Thu 4/10/25	16



Project: K&K Schedule_2023121
Date: Thu 12/14/23

Task	Project Summary	Manual Task	Start-only	Deadline
Split	Inactive Task	Duration-only	Finish-only	Progress
Milestone	Inactive Milestone	Manual Summary Rollup	External Tasks	Manual Progress
Summary	Inactive Summary	Manual Summary	External Milestone	