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2021-2022
Annual Remedial Action Report
Emerald Kalama Chemical, LLC

August 2022

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Remedial Action Annual Report
Emerald Kalama Chemical, LLC

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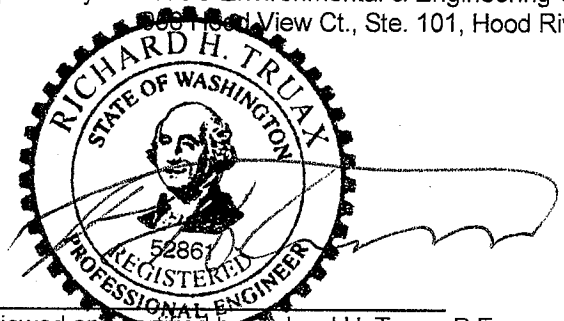

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1.0 Introduction

This document presents the annual monitoring report for ongoing remediation activities pursuant to the 2008 Consent Decree (CD) between the Washington State Department of Ecology (Ecology), and BF Goodrich, Inc. and Emerald Kalama Chemical, LLC (Emerald), at the Emerald facility in Kalama, Washington. The CD requires operation of the remedial actions (RA) presented in the *Cleanup Action Plan* (CAP) (Exhibit B of the CD; RETEC 2004a). The RAs presented in the CAP constitute the final cleanup actions for the site. This report describes maintenance, operation, and compliance monitoring of the RAs from May 2021 through April 2022.

The remediation systems design, operations, and compliance monitoring are described in the following documents:

- *Revised Design Report – North Impacted Area Interception Trench* (EMCON 1994)
- *West Impacted Area Interim Corrective Measure Phase 3 Final Design Report* (EMCON 1995)
- *Shallow Interception Trench System Operation and Maintenance Guidelines* (RETEC 1997)
- *Feasibility Study* (RETEC 2003)
- *Corrective Action Plan* (CAP; RETEC 2004a)
- *Compliance Monitoring Plan* (CMP; RETEC 2007)
- *Engineering Design Report* (EDR; ENSR/AECOM 2008)
- *Operations and Maintenance Plan* (O&M Plan; AECOM 2009).

Cleanup levels (CUL's) referred to in this document are those presented in the CAP and approved by Ecology on October 11, 2004 (RETEC 2004a). Additional relevant discussion of the location and behavior of contaminants in the intermediate sand at the site are also available in the RCRA WIA ICM Dispute Resolution September 23 – October 4,1996 Documents, ICM Scope of Work WIA (RETEC, November 1996), and ICM Annual Report (RETEC, April 1998) – collectively referred to herein as "ICM DR Documents".

1.1 Background

Historic spills at the Emerald facility resulted in impacts to the subsurface. These releases are described in the *Remedial Investigation Report, Rev. 2* (ThermoRetec 2000). As detailed in the Remedial Investigation Report, the impacts are contained within the upper sand unit at the remediation areas identified as the NIA and WIA, and the intermediate sand layer that extends under the WIA. The remediation monitoring and systems are therefore located in the North Impacted Area (NIA, shallow sand), West Impacted Area (WIA, shallow sand), and the intermediate sand unit beneath the WIA shallow sand. The layout of the Emerald facility is shown on Figure 1-1.

1.2 Summary of Remediation Activities and Contaminant Status

This section provides a summary description of remediation activities at the facility, and current contaminant(s) status in each area.

1.2.1 North Impacted Area

The NIA remediation consists of an interception trench system (Figure 1-1) that was constructed between October and November 1995 and continues to operate pursuant to the CD. The system objectives are to capture affected groundwater in the upper sand aquifer.

The upper sand aquifer is the uppermost hydrostratigraphic unit at the facility. In the NIA, the upper sand aquifer consists of approximately 9 to 17 feet of hydraulically placed sand fill overlying 3 to 7 feet of interbedded sands and silts. The interception trench is approximately 1,500 feet long and is constructed to variable depths such that it extends to the top of the underlying upper silt (collects groundwater from the shallow formation above the silt). The trench includes two collection sumps: an east sump collecting from approximately 950 feet of the trench, and a west sump collecting from the remaining approximately 550 feet of trench. Water from the sumps is pumped to the Emerald Low/High COD ModuTanks and then to the Emerald wastewater treatment system. The base and downgradient faces of the trench are lined with an impermeable geosynthetic liner. The liner contains groundwater within the trench and reduces the inflow of standing water that may be seasonally present in a wetland downgradient of the trench.

In the NIA east sump, diphenyl oxide (DPO) concentrations continue to be detected but have been below the approved cleanup level (CUL) and on generally downward trend since 2010. Benzene was uncharacteristically (compared to past sample data) detected above the CUL in the 20/21 sample period, but undetected at less than 0.50 ug/L including duplicate samples in this 21/22 sample period. Toluene continued to be undetected at less than 1.00 ug/L in the east sump samples. Toluene has never exceeded the CUL in the east Sump and has not been consistently above the analytical detection limit since 2008.

The NIA west sump DPO concentrations were below the CUL in both the October 2021 and April 2022 sample events. DPO concentrations in the west Sump have historically been above the CUL although on a generally decreasing trend. West sump benzene concentrations continued a decreasing trend with October 2021 continuing below the CUL as also indicated in October 2019 and 2020, and April data indicating just above the CUL at 2.7 ug/L. Toluene in the west sump continued at low detection level to non-detect concentrations far below the CUL.

The combined east and west sumps of the NIA pump an average of 20- to 30-million gallons of water through the EKC water treatment plant each year. The sumps pumped 29-million gallons of water in 2021-22 resulting in the removal of approximately 0.2 pounds of benzene, no toluene (not detected in 21/22 samples), and 39 pounds of DPO.

1.2.2 Central Impacted Area

The Central Impacted Area (CIA, Figure 1-1) contains portions of the shallow sand aquifer upgradient of the WIA and NIA. Remediation efforts in the CIA have targeted mass reduction of toluene via use of a soil vapor extraction system, and more recently, mass reduction of DPO via use of Waterloo Emitters™; a device intended to provide controlled release of oxygen to groundwater to enhance biodegradation. The soil vapor extraction system was successful in achieving the intended toluene removal goal and was closed with the approval of Ecology in December 2013. The CIA Waterloo Emitter™ system consisted of 55 emitter wells connected to a pressurized oxygen supply and began operating in February 2009. The effectiveness of the oxygen emitter system was evaluated during the

2015-16 operation year, and it was determined that the system was not providing further benefit toward mass reduction of DPO. Ecology approved Emerald's request to cease operations and close the system in May 2017.

The monitoring well data within the CIA are reported in the NIA and WIA data tables and maps according to the shallow upper sand aquifer groundwater flow direction at the wells (northerly [NIA] and westerly [WIA]).

1.2.3 West Impacted Area

The WIA remediation has consisted of two components (Figure 1-1):

- Two shallow interception trenches (identified as north and south) parallel to the river in the upper sand aquifer. This portion of the WIA remediation has reached CUL and was shut down with Ecology approval in November 2018 as further described in Section 1.2.3.1.
- A groundwater capture system comprised of ten recovery wells with submersible pumps in the intermediate sand aquifer and aligned parallel to the river (ISRW system).

Summaries of WIA systems are provided in the following subsections.

1.2.3.1 WIA Shallow Interception Trench

The WIA shallow interception trench system was constructed as an ICM during November 1997. The system is comprised of a south and a north trench each with sump and pump. The system objective was to collect contaminated groundwater (originally focused on toluene) from the upper sand aquifer, preventing discharge to the Columbia River. Toluene has been below the CUL since 2008. With the absence of toluene, DPO was the only constituent that continued to be detected but has been below the CUL since 2013 in the North sump and 2011 in the South sump. With the below CUL concentrations and resultant lack of constituent mass, EKC requested Ecology approval to cease operation of the trenches. Ecology approved EKC's request in the November 14, 2018 Recommended Changes to System Operations Letter. Per EKC's proposal and Ecology's approval the WIA shallow trench system remains in place and operable but is no longer operated unless future groundwater data indicates reason to restart the system.

1.2.3.2 WIA Intermediate Sand Recovery Wells (ISRW)

The ISRW system was installed as an ICM during April 1997 and upgraded pursuant to the CAP during February 2009. The system objective is to minimize discharge of affected intermediate sand aquifer groundwater to the Columbia River and reduce the mass of constituents in the aquifer. This is accomplished by maintaining an inward gradient to the recovery wells from upgradient and somewhat from the river. Submersible pumps in the recovery wells transfer water to the Emerald low COD ModuTank (Fig 1-1) which discharges to the wastewater treatment plant.

The ISRW system includes 10 recovery wells (ISRW-1 through ISRW-10). Seven of the recovery wells (ISRW-1 through ISRW- 7) were installed during February and March 1997. Recovery wells ISRW-1, ISRW-2b, ISRW-3, and ISRW-4 began operation during April 1997; these four wells were installed based on aquifer modeling to intercept the targeted intermediate sand aquifer flow, and subsequent operation data confirmed the modeled design basis (ICM DR Documents). At the request of Ecology, pumping of recovery wells ISRW-5, ISRW-6, and ISRW-7 was added during November and December 1997; this was done for added groundwater capture protection and operational backup redundancy of the system. Recovery wells ISRW-8, ISRW-9, and ISRW-10 were then added during February 2009 pursuant to the CAP and began operation during March 2009. These additional wells were requested by Ecology to ensure containment capability and redundancy even further.

An important ISRW operations understanding is that the 10-well system provides significant capture zone overlap and dewatering redundancy. As a result, the capture alignment is maintained even in the event of some ISRW's being temporarily off-line; for example, ISRW-1, -2, -3, and -4 captured the entire targeted alignment on their own when first constructed. EKC continues to maintain the system in a manner to keep all wells operational and maximize benzene and toluene mass removal.

Although they have decreased over time, benzene and toluene concentrations remain above their CUL in most of the ISRW's. The exception being ISRW-7 which has been consistently below the benzene and toluene CUL since 2018. As discussed in later sections of this report, the data show some wells collecting higher constituent concentrations whereas other wells are likely on the fringes of remaining constituents. Emerald continues to utilize the collected data to focus ISRW operations on constituent mass removal and minimizing discharge to the river. The ISRW wells pumped one million gallons of water to the EKC water treatment plant in 2021 – 2022 resulting in the removal of 217 pounds of toluene and 0.4 pounds of benzene.

1.3 Report Format

The NIA area groundwater monitoring and interception trench performance is described in Section 2. The WIA shallow groundwater monitoring is described in Section 3. The WIA intermediate sand groundwater monitoring and ISRW system performance is described in Section 4. References are provided in Section 5.

Note that NIA, CIA, and WIA shallow groundwater potentiometric maps are reported on combined figures 2-1 and 2-2 (potentiometric) and 2-3 and 2-4 (constituent concentrations) to provide a site-wide perspective of shallow groundwater

Supporting documentation includes Appendix A – potentiometric surface water level data tables; Appendix B - laboratory analytical reports (transmitted via e-file with e-copy of this report), and; Appendix C – 1998 ICM Annual Report Potentiometric Maps. A PDF of this entire document has also been transmitted via email e-file.

2.0 NIA Well Monitoring & Interception Trench System

2.1 Monitoring Program Description

The monitoring plan for the upper sand aquifer NIA interception trench consists of three primary components:

1. Collection of data to evaluate the ongoing groundwater quality in the NIA.
2. Collection of groundwater elevation data to monitor ongoing flow direction and gradient in the NIA including the barrier trench and sumps.
3. Visual inspection of ground surface integrity to assure no erosion or other damage of the length of interception trench.

The NIA monitoring program scope is described in the following sections and summarized in Table 2-1. All NIA monitoring locations are shown on Figure 2-1.

2.2 Visual Inspection of Integrity of NIA Trench

The entire 1,500-foot length of the NIA trench and barrier wall was inspected for ground surface indications of damage, leaks, or erosion during the April 2022 groundwater sampling event. This inspection involved walking the top of the soil berm above the barrier wall / trench alignment. No indications of damage, leaks or erosion were observed. The entire length is heavily vegetated, firm, and well established. As in the past, the inspection included removing areas of downed trees and brush presenting obstructions to trench operation and monitoring locations.

2.3 Groundwater Levels and Flow

NIA groundwater levels were measured semi-annually at the following locations:

- Shallow (upper) sand monitor wells and piezometers (KC-8, KC-9, KC-21, KC-23, PZ-102, PDW-117, MW-210, MW-230, MW-231, MW-232, MW-245, and MW-256) located upgradient of the trench. These locations include NIA and CIA areas from which groundwater is generally flowing northerly towards the NIA barrier and recovery trench.
- Three piezometers (NTP-1, NTP-2, NTP-3) installed along the length of the trench that monitor groundwater elevations in the trench.
- Wetland staff gauge.

Tables B NIA and CIA (Appendix A) summarize the groundwater and wetland elevation data. The data were used to construct shallow sand potentiometric surface maps (Figures 2-1 and 2-2) for October of 2021 and April of 2022.

2.3.1 NIA Upper Sand Aquifer Groundwater Levels

As expected, lower groundwater elevations were observed during the dry season October 2021, and higher elevations were observed during the wet season April 2022. Similarly, the wetland was dry in October and contained water in April. The winter and spring months bring precipitation and areal floodplain runoff to the wetland along with higher groundwater elevations. This is reflected by the wetland staff gauge April water level of 2.7-feet. As shown on Figures 2-1 and 2-2, in both October and April, water elevations in the trench were stable and below up-gradient groundwater elevations indicating the ongoing normal operation of the trench.

2.3.2 Upper Sand Aquifer Groundwater Flow

NIA aquifer groundwater flow is towards the north (Figures 2-1 and 2-2). This flow pattern was observed under both low and high groundwater table conditions (October and April respectively) and is consistent with historical monitoring results. The groundwater gradient is shallow in the CIA region of northerly flow and steepens as it approaches the containment recovery trench. The October gradient was 0.005 ft/ft and April was 0.006 ft/ft.

2.4 Groundwater Quality

The NIA groundwater quality monitoring network is comprised of six wells (MW-245, MW-256, MW-230, MW-231, PDW-117, and KC-9), and the east and west NIA trench sumps.

Monitoring results are described below and presented in Table 2-2. Areal distributions for benzene and DPO are provided on Figures 2-3 and 2-4 respectively and include an overlay of the potentiometric contours. Laboratory data reports are provided in Appendix B (e-file).

2.4.1 Sampling and Analytical Procedures

All sampling and laboratory analyses were completed in accordance with the *Sampling and Analysis Plan* (SAP; RETEC 2004c). The October 2021 groundwater samples were submitted to Specialty Laboratory (Portland, Oregon). The April 2022 samples were submitted to ALS Laboratories (Kelso, WA). It is anticipated that future samples will continue to be submitted to ALS Laboratories based on the availability of specific analyte standards. Samples were analyzed using one or both of the following methods per the sample analytical requirement (Table 2-1):

- Volatile organic compounds (VOCs) [benzene and toluene] using EPA Method 8260C.
- Semi-volatile organic compounds (SVOCs) [diphenyl oxide (DPO), and biphenyl (east and west sumps only)] using EPA Method 8270D.

2.4.2 Upper Sand Aquifer Sampling Results

The analytical results are detailed on Table 2-2. Benzene and DPO are the only two constituents detected at concentrations that exceed the CULs; benzene at three locations and DPO at two. Figures 2-3 (benzene) and 2-4 (DPO) provide areal map views of concentration data for these constituents.

VOCs

The 2021 – 2022 VOC (benzene and toluene) results for the NIA agree with the concentrations and trends of the existing historical data. The 20 / 21 Annual Report indicated benzene above the CUL in the east sump which had not been seen since 2012. As reported therein and shown on Table 2-2, additional quarterly samples were collected and indicated a steady decrease in the east sump benzene concentration. Samples for this 21 / 22 monitoring period did not indicate benzene in the east sump at detection levels of 0.5 and 0.3 ug/L. The 21/22 non-detect data further supports the 20/21 report statement that the east sump benzene data was a localized event indicative of the NIA trench operating as intended.

Monitor well KC-9 (upgradient of the NIA west sump) indicated a low exceedance of the benzene CUL in October 2021 (2.96 ug/L) and below the CUL in April 2022 (1.0 ug/L). Monitor location PDW-117 upgradient of KC-9 and the west sump showed continued lower benzene concentrations with a detection level (0.680 ug/L) result in October and below detection (<0.50 ug/L) in April. As noted, these data agree with and continue to indicate an overall downward trend of benzene in the downgradient / trench area of the NIA.

Further upgradient of the NIA trench in the northerly groundwater flow portion of the CIA area, well MW-230 has shown CUL level benzene concentrations and MW-231 has intermittent detections of benzene and toluene although consistent CUL exceedances at -231 are prior to 2015. As shown on Table 2-2, these concentrations have also steadily decreased over time with recent results at both wells varying from near the CUL (1.2 ug/L) to below detection level (<0.300 ug/L). As detailed in the 2019 – 2020 Annual Report, an outlier result of elevated benzene and toluene concentrations was indicated at MW-231 in April 2020. Additional sampling including a blind duplicate in May 2020 (Table 2-2) indicated below CUL / below detection limit results as have the three sample events since.

SVOCs

The 2021 – 2022 NIA SVOC monitoring results also agree with and continue the trend of the historical data. Diphenyl Oxide (DPO) is the only SVOC with historical and ongoing CUL exceedances in the NIA. As shown on Table 2-2, the ongoing detection concentrations of DPO are trending downward with intermittent up / down spikes. DPO CUL (410 ug/L) exceedances this year are indicated at two wells: KC-9 (2,630 and 1,400 ug/L) and PDW-117 (1,030 and 1,300 ug/L). MW-231 which has fluctuated above / below the CUL, and the west sump were both below the DPO CUL for the 21 / 22 sample set. The east Sump and MW's -230, -232, -245, and -256, have been below the DPO CUL generally since October 2011 or earlier (the exception being MW-230 since April 2017).

Biphenyl has been detected in portions of the NIA but has never exceeded the CUL (230 ug/L) in the sumps. After the 2017 – 18 sample year Ecology approved EKC's proposal to cease biphenyl sampling in the NIA wells but requested biphenyl sampling be resumed in the sumps. Beginning with the April 2019 sampling, biphenyl analysis has been included in both the East and West sumps. The east sump biphenyl results continued non-detect for 21 / 22, and the west were non-detect in October and just above detection at 5.4 ug/L in April 2022.

2.5 NIA Trench & Sump System Monitoring

The NIA interception trench system operated continuously throughout the monitoring period. Monitoring results are described below and summarized in Tables 2-3 and 2-4.

2.5.1 Groundwater Extraction

Table 2-3 summarizes the east and west sump pump operation data, the volume of water removed from the trench, and the average pumping rates during the 2021 - 2022 and past performance periods. Approximately 29 million gallons of water were pumped from the NIA interception trench during 21/22. The 29-million-gallon total volume is somewhat above average of typical annual volumes (27.4 million gallons is annual average since 1999). The NIA trench system water volumes are of course heavily dependent on annual precipitation totals and the flows vary with wetter / drier seasons. As shown on Table 2-3, the lowest average GPM and volumes were July thru October, with the highest being November thru April.

2.5.2 Mass Removal

Table 2-4 provides data for the east and west sump discharges and the approximate mass of contaminants removed during the 21/22 performance period. The contaminant mass calculations were determined by multiplying semi-annual sump sample concentration data by the cumulative pump discharge volume for the corresponding 6-month period. Approximately 0.2-pounds of benzene and 39 pounds of DPO were removed during this reporting period (toluene was not detected).

As discussed in Section 2.4.2, the concentrations of benzene, toluene and DPO in the NIA have decreased over the system operating time frame. The annual quantities of benzene, toluene and DPO

removed from the 2007-2008 monitoring period to present are summarized in the table below. Historical soil vapor extraction system operations also played a role in the NIA VOC reductions as shown by the significant reductions in benzene and toluene mass removals (and analytical sample concentrations) in the earlier years of NIA operations.

Performance Period	Benzene removed (lbs)	Toluene removed (lbs)	DPO removed (lbs)
2021-22	0.2	0	39
2020-21	4.2	0.3	103.3
2019-20	0.5	0.5	89.9
2018-19	0.9	0.5	82.7
2017-18	1.5	0.7	97.8
2016-17	4.5	2.9	58.9
2015-16	3.5	2.4	35.1
2014-15	3.2	3.4	91.3
2013-14	5.4	7.5	90.1
2012-13	5.1	7.8	103.5
2011-12	6.4	24.0	98.0
2010-11	7.6	16.6	105
2009-10	6.0	38.1	103
2008-09	6.6	46.1	127
2007-08	26.4	254	207
Total	**82**	**404.8**	**1,432**

2.5.3 System Maintenance

EKC has maintained system flows via regular maintenance including pipe cleaning using compressed air agitation and line-pigging. Other significant maintenance efforts conducted from time to time as needed include vacuum removal of sediments from the sump bottoms, flushing the NIA trench collection pipe, replacing old PVC piping with stainless steel piping, and replacing/repairing pumps. In addition, the sump areas and outlying NIA wells and piezometers are maintained with tree and brush clearing for access along with paint and label identification upkeep.

2.6 Performance Evaluation

Overall, the NIA data set dating back to October 2007 is indicative of the groundwater constituent plume being in a state of ongoing intrinsic biodegradation, decreasing constituent concentrations, and continued recovery trench operation to contain any residuals that may eventually migrate to the trench. The following are conclusions about the performance and effectiveness of the NIA interception trench system, based on monitoring data collected during the 21/22 performance period:

- The NIA trench system removed 0.2-pounds of benzene and 39-pounds of DPO in the 21/22 operational year (toluene was non-detect). As expected with the continued decrease of

constituent concentrations, this is the lowest annual mass removal reported for the system despite above average water removal volume of 29-million gallons.

- The trench system continues to fulfill its purpose of hydraulic control of the NIA, preventing discharge of groundwater from the upper sand aquifer to the wetland. This is illustrated on potentiometric figures 2-1 and 2-2.
- The overall data set from 2007 to present indicates a continued decreasing trend in the concentration of detected contaminants.

2.7 Recommended Changes to NIA Operation / Monitoring

The Table 2-2 NIA data set provides 13 to 15 years of semi-annual groundwater sampling. The NIA data set presented in previous sections of this report continue to indicate stable constituent locations along with a downward trend of concentrations. No differentiating trend or behavior has been observed over this time between the semi-annual April and October sampling times. There are events of higher or lower concentrations but the overall trend and groundwater behavior at each well has been consistent. Based on the wealth and consistency of the data, Emerald proposes modifying the sampling schedule to an annual basis as follows:

- ***Cease groundwater sampling but continue elevation gauging at well MW-230***: Well MW-230 data (Table 2-2) has indicated decreasing benzene concentrations marginally above the CUL (1.2 ug/L) along with occasional below CUL or non-detect results. Toluene has never shown an exceedance at MW-230 over the entire time of sampling since 2009. DPO while present, has not shown a CUL exceedance since 2016. Well MW-230 is located in the interior area of the CIA which has been shown to have a shallow to flat groundwater gradient with little potential for migration of the low concentration constituents (June 29, 2016, Evaluation Report of Oxygen Emitter Effectiveness [RSEC letter to Ecology]). As a result, there is not a continued benefit to groundwater sampling at MW-230. Groundwater elevation gauging at MW-230 would continue at the same time as monitoring of the other NIA wells.

- ***Cease groundwater sampling and elevation gauging at well MW-231***: Well MW-231 data (Table 2-2) has similar characteristics to MW-230. Benzene and toluene concentrations have been below the CUL since 2014 (with one exception each) and what is believed to be an anomalous April 2020 event as discussed in Section 2.4.2 and shown on Table 2-2. The MW-231 DPO data is intermittently above/below the CUL and remains within a comparable range. Based on the steady-state concentrations and lack of decision-making / beneficial use for adding to this data, along with the well location within active rail tracks, Emerald proposes to cease sampling and gauging at this well.

- ***Modify sampling and gauging at all NIA wells to annual (April of each year)***: The NIA semi-annual sampling has provided a robust data set of seasonally high (April) and low (October) groundwater conditions since the 2007 / 2009 timeframe (Table 2-2). As noted, the data indicates stable constituent locations with overall downward concentration trends. Continued semi-annual sampling is not adding further beneficial data to this overall analysis. Emerald proposes that the NIA sampling and gauging schedule be modified to an annual basis once a year in April when groundwater elevations are higher providing for reliable sampling of the saturated zone. In the event future data indicates a need for a return to semi-annual sampling the schedule can be modified back to the semi-annual basis (we are not proposing to abandon these wells at this time).

3.0 WIA Shallow Wells & Interception Trench System

3.1 Monitoring Program Description

The monitoring plan for the shallow WIA wells consists of two primary components:

1) collection of water elevation data to define groundwater flow direction and gradient, and

2) collection of water quality data to evaluate the occurrence and movement, if any, of dissolved residual constituents of interest.

The WIA shallow well monitoring is described in the following sections and summarized in Table 3-1. All monitoring locations are shown on Figures 2-1 and 2-2.

3.2 Groundwater Levels and Flow

Water levels were measured semi-annually at the following upper sand (shallow) locations:

- KC-24R, PZ-104, PZ-107, USRW-2, KC-13, MW-238, MW-255, PZ-110, and the North and South trench sumps.

Table B-4 (Appendix A) summarizes semiannual groundwater elevation data. The data were used to construct the shallow potentiometric surface maps for October 2021 and April 2022 (Figures 2-1 and 2-2 respectively).

3.3 WIA Upper Sand Aquifer Groundwater Flow

In the WIA, groundwater flow within the upper sand aquifer is westerly from a nearly flat gradient in the PZ-104 / -107 / MW-230 area (Figures 2-1 and 2-2). This flow pattern was observed during both high and low water table conditions (April and October) and is consistent with historical monitoring results. The hydraulic gradient across the WIA upper sand is consistent at 0.007 ft/ft in both October and April.

The PZ-104 / -107 area and further east / upgradient is influenced by the shallow gradient in this area of the site (Figures 2-1 and 2-2) with little potentiometric gradient over much of this area. The June 29, 2016, Evaluation Report of Oxygen Emitter Effectiveness (RSEC letter to Ecology) provides detail of this lack of constituent migration, shallow groundwater gradient, and even indication of occasional reversing gradient.

3.4 WIA Upper Sand Groundwater Quality

Groundwater samples were collected from WIA upper sand wells USRW-2, PZ-104, and PZ-107. Well MW-230 is reported in the NIA Section 2.0 of this report (Table 2-2).

3.4.1 Sampling and Analytical Procedures

All sampling and laboratory analyses were completed in accordance with the SAP and analyte revisions approved by Ecology. The October 2021 groundwater samples were submitted to Specialty Laboratory (Portland, Oregon). The April 2022 samples were submitted to ALS Laboratories (Kelso, WA). It is anticipated future samples will continue to be submitted to ALS Laboratories based on

availability of specific analyte standards. Samples were analyzed using one or both of the following methods per the sample analytical requirement (Table 3-1):

- Volatile organic compounds (VOCs) [benzene and toluene] using EPA Method 8260C.
- Semi-volatile organic compounds (SVOCs) [DPO, biphenyl, and bis(2-ethylhexyl) phthalate] using EPA Method 8270D.

Laboratory data are included in Appendix B (e-file).

3.4.2 Upper Sand Aquifer Sampling Results

The WIA upper sand data are summarized in Table 3-2 and shown on Figures 2-3 (benzene) and 2-4 (DPO).

DPO concentrations in the area of the WIA shallow trench (USRW-2) agree with past data indicating continued downward trends below the 410 ug/L CUL with the 21/22 data indicating non-detect below 0.48 ug/L). USRW-2 DPO concentrations have been below the CUL since 2013 with one exception in 2015. The data set continues to support the approved November 2018 shutdown of the WIA Shallow Trench System.

Over 300-feet upgradient of the WIA trenches, in the nearly flat westerly flow portion of the CIA area, wells PZ-104 and PZ-107 continue to show detections of DPO and biphenyl. The concentration of DPO at PZ-104 has been relatively consistent over time and indicated 4,300 ug/L in October 2021 and 3,300 ug/L in April 2022. PZ-107 has shown more of a decreasing DPO trend below CUL results for October 2021 (21.8 ug/L) and April 2022 (64 ug/L). Biphenyl concentrations have been almost entirely below the 230 ug/L CUL at PZ-104 since 2009 and have trended downward at PZ-107 to below the CUL since 2019 excepting October 2020 (261 ug/L) with below CUL results in October 2021 (60.9 ug/L) and April 2022 (17 ug/L). It is noted that the Specialty Analytical Laboratory (Portland, Oregon) report for October 2021 had inconsistencies for PZ-104 DPO and biphenyl including the 3,430 ug/L blind duplicate result compared to the 81.5 ug/L original sample.

Benzene has generally been near the CUL at PZ-104 (0.940 ug/L and 1.7 ug/L October 2021 and April 2022 respectively) but not detected since 2018 at PZ-107 (not detected at 0.300 and 0.50 October and April).

3.5 WIA Shallow Trench Discharge Monitoring

The WIA shallow interception trench system was recommended to be shut down in the 2017-18 Annual Report and Ecology approved this recommendation in the November 14, 2018, Recommended Changes letter. Pumping of the shallow trench was ceased on November 28, 2018, and in accordance with Ecology's approval the system remains in place and operable. The north and south trench pumps are briefly operated approximately quarterly to assure continued operational status. The system will remain in place for possible future use if indicated by ongoing shallow WIA aquifer monitoring.

3.6 Recommended Changes to WIA Shallow Monitoring

Modify sampling and gauging at WIA shallow wells to annual (April of each year): Similar to the NIA data set, the Table 3-2 shallow WIA data set provides 13 to 15 years of semi-annual groundwater data. The WIA data set indicates constituent concentrations that have dropped to below their CUL with PZ-107 as the remaining location with consistent above CUL concentrations for DPO and at CUL concentrations for benzene. As with the NIA, no differentiating trend or behavior has been observed over this time between the semi-annual April and October sampling times. There are

events of higher or lower concentrations but the overall trend and groundwater behavior at each well has been consistent. Based on the amount and consistency of the data, there is not a clear benefit to continuing the semi-annual sampling. Emerald proposes that the WIA upper sand sampling and gauging schedule be modified to an annual basis once a year in April. In the event future data indicates a need for a return to semi-annual sampling the schedule can be modified back to the semi-annual basis.

4.0 WIA Intermediate Sand System

4.1 Monitoring Program Description

The monitoring plan for the WIA intermediate sand recovery well (ISRW) system consists of the following components: 1) weekly monitoring of recovery system operation and water volume production with appropriate operation adjustments; 2) semi-annual sampling of recovery wells discharge water quality; and 3) semi-annual water quality sampling and water elevation gauging of monitoring wells. WIA intermediate sand monitoring is described in the following sections and is summarized in Table 4-1. The behavior of the subject VOCs (benzene and toluene) in relation to the intermediate sand aquifer continue to be evaluated and compared with hypotheses used to design the system as described in the ICM DR Documents (RETEC 1996, RETEC 1998).

In addition to the required semi-annual (April and October) monitoring program, in 2018 EKC elected to collect water samples for benzene and toluene analysis from the 10 ISRW wells in July and January. This resulted in quarterly ISRW water quality data, and semi-annual monitor well sampling and water elevation data. The additional ISRW data are to assist in focusing benzene and toluene mass removal efforts at the ISRW wells as described further in the following sections.

4.2 Groundwater and River Elevations and Groundwater Flow

Intermediate sand aquifer groundwater elevations were measured semi-annually in October 2021 and April 2022 per Ecology approvals to date. In addition, ISRW groundwater elevation data is collected during the EKC elective additional quarterly sampling events. Groundwater elevations are recorded at the following locations:

- Recovery wells ISRW-1 through ISRW-10
- Monitoring wells KC-6, KC-14, MW-239, MW-243, and MW-250
- Piezometers PZ-117 and PZ-118.

Table B-3 (Appendix A) summarizes the quarterly groundwater elevation data. The data was used to construct WIA potentiometric surface maps quarterly for the intermediate sand zone (Figures 4-1 through 4-4). As shown on Figures 4-1 through 4-4, the ISRW well alignment maintains an inward groundwater depression capturing intermediate sand groundwater and some portion of river water. The ISRW water levels are controlled by the recovery pump operations and capture the intermediate sand groundwater along the alignment. Further discussion of the intermediate sand and ISRW system operation and performance is provided in Section 4.4.

4.3 Groundwater Quality

Groundwater samples were collected semi-annually (October and April) from 10 recovery wells (ISRW-1 through ISRW-10) and four monitoring wells: KC-14, MW-239, MW-243, and MW-250. Laboratory data reports are included in Appendix B (e-file). As noted earlier, EKC also elected to continue to collect two additional rounds (January and July) of groundwater samples for benzene and toluene analysis from just the 10 ISRW wells resulting in quarterly data for the ISRW wells.

4.3.1 Sampling and Analytical Procedures

All semi-annual monitoring program sampling and laboratory analyses were completed in accordance with the SAP (RETEC 2004c), and Ecology approved revisions reported in past Annual Reports. During 2021 groundwater samples were submitted to Specialty Analytical Laboratory

(Portland, OR) for VOCs [benzene and toluene] using EPA Method 8260C at the four monitoring wells and EPA Method 8021 for the 10 recovery wells. In the third quarter of 2021 (July) select duplicates were also submitted to ALS Laboratories (Kelso, WA) with all analyses being conducted using EPA Method 8260C (as noted on Table 4-2). Beginning with the January 2022 sampling, all samples are submitted to ALS Laboratories utilizing Method 8260C.

4.3.2 Intermediate Sand Aquifer Sampling Results

The monitor well and ISRW groundwater quality analytical results are summarized in Table 4-2, and Figures 4-5 and 4-6. In summary, the 2021-22 data set compares similarly with the recent past few years at the respective wells and the overall trends for the ISRW area. Several specific notes include:

- Well ISRW-7 remained off throughout this 21/22 reporting period. ISRW-7 has been below CUL's for benzene since 2018 (excepting two quarters in 2020) and toluene since 2017. ISRW-7 is located at the south end of the ISRW alignment and appears to be indicative of the contaminant plume reducing in size.
- Well ISRW-4 is the next most southerly well (compared to ISRW-7). ISRW-4 has indicated reduced concentrations of benzene approaching the CUL since 2020 and intermittently above / below CUL toluene results for many years. Pumping at ISRW-4 continues while this well appears to represent the southerly edge of remaining benzene and toluene plume.
- The remaining ISRW wells continue to show what has become characteristic behavior with some wells consistently having the highest benzene and toluene concentrations (ISRW-1, -2, -10, -5, -3, and -8) while ISRW-6 and -9 continue to have elevated results but also occasional lower concentrations or even below CUL.
- In general, ISRW recovery concentrations tend to be higher when the river elevation is higher (above 6-feet for example) and groundwater elevations are higher (January, April, and July depending on the water year). This of course results in higher water volume recovery, more of the impacted intermediate sand zone being saturated, and therefore more transport of constituents to the pumping wells.

During the 21/22 monitoring period, three of the four intermediate sand monitoring network wells (MW-243, KC-14, MW-250) indicate non-detect results for benzene and toluene with one exception; KC-14 indicated 2.8 ug/L benzene and 15 ug/L toluene. These results agree with the historical data at these wells. Monitor well MW-239 results were above CUL for benzene and somewhat below and then above CUL for toluene with concentrations that compare with historical data at this well. This data is interesting when compared with adjacent ISRW data. For example, KC-14 which indicates non-detect results is bracketed by ISRW's -3 and -8 which both indicate some of the higher ISRW removal concentrations in the network. MW-239 indicates consistently above CUL data while ISRW-4 adjacent to the south is often lower concentrations or below CUL, whereas ISRW-10 adjacent to the north indicates concentrations similar to or higher than MW-239. River flow direction likely influences the ISRW wells, particularly those closer to the river including ISRW-4 and -10 and may therefore play a role in the higher ISRW-10 concentrations compared to ISRW-4. In addition, MW-239 concentrations were comparatively lower in 21/22 compared to past years; this may be early indication of the southern plume edge continuing to move north (plume shrinkage) or may be the typical variability in the alignment sampling data – continued operations and monitoring will provide further analysis.

4.4 ISRW System Description and Performance

The following sections provide a description of the ISRW system arrangement, operations, and performance.

4.4.1 ISRW System Arrangement and Operation

Figure 4-7 provides a cross section of the 10 well alignment including screen depths, top of the intermediate sand layer, and the pump floats and intake locations. Each well contains a half-horsepower electric submersible pump that is controlled by two floats and a programmable logic control (PLC) system. The lower float is activated by rising water in the well and starts a delay timer (delays the start of the pump as set at the PLC panel). The pump starts at the end of the delay and pumps until the water drops back below the low float. Each well also has a high-level float which is activated in the event water in the well reaches that upper level in which case the pump immediately starts (no delay). The high-level start event occurs when either there is a failure with the low-level float (typically the float is fouled in some manner) or if surrounding groundwater levels are high enough to reach the high-level float before the delay timer starts the pump (in these cases the operator repairs the floats and/or reduces the delay programming). Each well head also has a numeric (non-electronic) flow totalizer for recording gallons pumped by each well, a backflow valve to prevent flow of water back into the well, and a valve for flow control. All ten wells pump into a single pipe trunk line that carries the water to the EKC Modu-tanks which then pump to the EKC water treatment plant.

Figure 4-7 is helpful in describing the arrangement of the floats and pump operations. The ISRW wells were primarily finished with 10-foot intake screens extending downward from the top of the intermediate sand. ISRW 1 – 7 were installed in 1997 as part of Interim Corrective Measures, and ISRW 8, 9, and 10 were installed in 2007 as part of the final remedy. The well pump intakes are set approximately at the bottom or just below the bottom of each well screen (each well has a 2-foot sump bottom below the screen), and the low floats are placed above the top of the well pump. The high floats are approximately four- to five-feet above the low floats. As shown on Figure 4-7, the river surface elevation fluctuates during the year but is typically above the top-of-sand elevation, is always above the low float and pump intake elevations, and hence the ISRW well water levels are maintained below the river elevation creating an inward water gradient.

The 2018 – 19 Annual Report provided details from the 1998 ICM Annual Report, Section 4, Intermediate Sand Recovery Well System including potentiometric maps (Figs 4-2e thru 4-2i) indicating intermediate sand groundwater capture of the ISRW alignment area via pumping only wells 1 through 4 (provided herein Appendix C for ease of reference). Based on this capture zone analysis and the cumulative mass removal data, an operational adjustment was proposed in the 2018 – 19 Report to focus pumping on wells with higher contaminant concentrations while maintaining the desired capture zone rather than always pumping all ten wells. This proposed operational adjustment was approved in the October 22, 2019, Ecology letter, Appendix A of the 2019 – 2020 Annual Report.

4.4.2 ISRW Mass Removal

Table 4-3 presents the ISRW water extraction volumes for the monitoring period including the total volume of groundwater pumped from each well. As shown, approximately 1-million gallons of groundwater were extracted from the WIA intermediate sand aquifer during the 2021–2022 performance period. Table 4-4 combines the 2021 – 2022 groundwater extraction volumes and average benzene and toluene concentrations to calculate the mass removals for the ISRW wells. Approximately 0.4-pounds of benzene and 217 pounds of toluene were removed during the 2021-2022 performance period.

Based on statements from historical reports and calculation of more recent data, approximately 52,545 pounds of toluene have been removed since ISRW system startup in April 1997 (approximately 7,300 gallons at 7.2 pounds per gallon over the life of the system). Similar calculations for benzene mass removal are not provided due to the historical analytical dilutions required for the toluene concentrations and therefore lack of specific benzene concentration data.

Table 4-5 provides annual water extraction volumes and mass removals for several years of system operations dating back to 1997-1998 (note individual annual data for all years since 1997 was not available). The Table 4-5 data over time indicates that the annual mass contaminant removals are decreasing, as expected with the decreasing VOC concentrations compared to earlier years of operations. The Table 4-5 data also indicates that the volume of water extracted has been decreasing over the period of operations. The lower extraction volumes are associated with multiple factors including NOAA precipitation data indicating below average precipitation for several years dating back to 2010, the more recent shut-down of ISRW-7 due to below CUL and non-detect results (ISRW-7 previously pumped 600,000 gallons of water in 2018 for example), and the continued pumping of the somewhat isolated intermediate sand has reduced the overall available water volume.

4.4.3 ISRW System Maintenance

The ISRW system operated continuously throughout the monitoring period, except during short-duration individual well shutdowns (typically 1 – 2 hours for an individual well while other wells continue to operate). The ISRW maintenance activities for the current reporting period included:

- Pump and float removal, cleaning, and reinstallation. This maintenance is conducted on an approximately monthly per well rolling schedule.
- As-needed replacement of electrical system fuses, capacitors, level floats, totalizers, and power cables due to normal wear.
- Replacement of submersible pumps and/or motors when required – typically due to wear of bearings, pump mechanisms, and pump motors.
- Ongoing maintenance of above ground apparatus including well-heads, hoses, and connections.

These ongoing maintenance efforts have ensured continued uninterrupted operation of the ISRW system.

4.4.4 ISRW Future Operations Plan

The WIA ISRW system continues to minimize discharge of affected intermediate sand groundwater to the Columbia River and reduce the mass of constituents in the aquifer. Ongoing appropriate system monitoring and maintenance will continue to minimize pump down times and equipment replacement requirements.

ISRW operations will continue much as they have in the recent past. ISRW-7 is currently shut-down and expected to remain that way unless groundwater samples return to above CULs. ISRW-7 is believed to be influenced by river in-flow and therefore pumps large amounts of river water without any apparent benefit. With ISRW-7 off, it is possible some of the river in-flow continues through the intermediate sand formation to ISRW's -1, -4, and -10 possibly assisting in contaminant mass movement to these extraction wells. This possibility has not been directly proven by the data to date,

but likewise there is no apparent operational draw-back. EKC will continue to operate the system in accordance with the requirements and goals described herein.

4.5 Recommended Changes to System Operation

EKC is not proposing any revisions to the ISRW operations and monitoring program for this year.

5.0 References

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Tables

Table 2-1
NIA Monitoring Program 2021 - 2022
Emerald Kalama Chemical, Kalama, WA

Well Location	Sampling Frequency	Field Parameters	Analytical Parameters	Gauging Frequency
NTP-1, NTP-2, NTP-3, KC-8, KC-9, KC-21, KC-23, MW-210, MW-231, MW-232, MW-230, PZ-102, PDW-117, MW-245, MW-256, Wetland Staff Gauge	—	—	—	Semiannually
East Sump, West Sump	Semiannually	—	Benzene, Toluene, Biphenyl, DPO	
MW-231, KC-9, PDW-117, MW-230	Semiannually	Temperature, pH, ORP, conductivity, turbidity, DO	Benzene, Toluene, DPO	
MW-245, MW-256	Semiannually	Temperature, pH, ORP, conductivity, turbidity, DO	DPO	
Observation Walk Length of NIA Containment Trench Ground Surface	Annually	Visual observation for surface damage that may impact trench & subsurface containment berm	—	—

Notes:
DO = dissolved oxygen; ORP = oxidation reduction potential; NIA = North Impacted Area; DEHP / Bis(2-ethylhexyl)phthalate not required at MW-232, -245 & -256 Ecy 112916 & 111418; DPO = Diphenyl Oxide; biphenyl add NIA E&W, remove -210, -231, -230, -9, -117 Ecy 111418. Cease sampling MW-210 & -232 (continue gauging) Ecy 111418.

Table 2-2
NIA Groundwater Analytical Data (10/2007 – 4/2022)
Emerald Kalama Chemical, Kalama, WA

Well	Date	VOCs (µg/L) (EPA Method 8021B/8260)		SVOCs (µg/L) (EPA Method 8270C SIM)				
		Benzene	Toluene	Benzoic Acid	Biphenyl	Bis (2-ethylhexyl) phthalate	Diphenyl Oxide	Phenol
	Cleanup Level	**1.2**	**2,000**	**24,590**	**230**	**1.8**	**410**	**2,560**
MW-210	10/20/2009	**51**	< 1.0	< 9.6 J	**74**	< 0.96	**1,800**	**19**
	4/22/2010	**23**	< 1.0	<10 J	**79**	< 1.0	**820**	**27**
	10/21/2010	**22**	< 1.0	< 9.8	**39**	<0.98	**1,700**	**17**
	10/10/2011	**7.7**	< 1.0	<9.3	**100**	**<2.4**	**1,400**	**11**
	4/18/2012	**16**	< 1.0	**9.6**	**150**	<0.93	**990**	**40**
	11/8/2012	**5.7**	< 1.0	<9.5 UJ	**21**	<0.95	**850**	**4.8**
	4/11/2013	**1.5**	< 1.0	<9.5	**10**	<0.95	**580**	**4.9**
	10/15/2013	< 1.0	< 1.0	<9.9 UJ	<0.99	<0.99	**250**	**7.6**
	4/16/2014	< 1.0	< 1.0	<9.5	<0.95	<0.95	**490**	<1.9
	10/23/2014	< 0.060	< 0.11	< 0.39 H	< 0.095 H	< 0.26 H	**590 H**	**1.2 JH**
	4/22/2015	< 0.42	< 0.44	< 0.39	< 0.095	**1.2 JB**	**330**	**2.2 J**
	10/20/2015	< 1.0	< 1.0	< 9.5	< 0.95	< 0.95	**1,500 D**	**14**
	4/13/2016	< 1.0	< 1.0	< 9.5	< 0.95	< 0.95	**44**	**8.5**
	10/28/2016	< 1.0	< 1.0	NA	**1.6**	NA	**780 D**	NA
	4/11/2017	< 0.50	< 1.0	NA	**1.8**	NA	**32**	NA
	10/5/2017	< 0.50	< 1.0	NA	< 0.97	NA	**210**	NA
	4/26/2018	< 1.0	< 1.0	NA	< 0.96	NA	**88**	NA
	10/2/2018	< 0.30	< 1.0	NA	< 0.47	NA	**654 D**	NA
		MW-210 Ecy Approved Cease Sampling, Continue Water Level Gauging 11-14-18						
MW-230	10/22/2009	**32**	**9.9**	**91 J**	**380**	**1.7**	**520**	**12**
	4/23/2010	**18**	**5.9**	**< 200 J**	**350**	**<20**	**390**	**93**
	10/20/2010	**23**	**5.2**	**74**	**470**	**6.8**	**590**	**44**
	10/11/2011	**44**	**5.2**	**22**	**450**	**<2.4**	**460**	**27**
	4/18/2012	**10**	**1.3**	**180**	**160**	<0.95	**220**	**38**
	11/7/2012	**16**	**2.7**	**30 J**	**130**	<0.95	**220**	**48**
	4/11/2013	**31**	**5.4**	**130**	**160**	<0.95	**240**	**39**
	10/16/2013	**8.8**	**8.0**	**79,000 J**	**170**	<1.1	**420**	**210**
	4/15/2014	**7.9**	**6.0**	<48	**500**	**<4.8**	**520**	**22**
	10/23/2014	**6.4**	**1.2**	< 0.39 H	**490 H**	< 0.26 H	**690 H**	**22 H**
	10/23/2014 Dup	**4.8**	**0.87 J**	**9.3 JH**	**520 H**	< 0.26 H	**690 H**	**23 H**
	4/22/2015	**14**	**0.90 J**	**28**	**250**	**2.5 JB**	**320**	**20 J**
	10/21/2015	**7.4**	**3.8**	< 9.5	**150**	< 0.95	**480 D**	**7.4**
	10/21/2015 Dup	**7.5**	**3.6**	< 9.5	**160**	< 0.95	**400 D**	**6.8**
	4/12/2016	**11**	< 1.0	**15**	**200**	< 0.95	**260 D**	**11**
	10/28/2016	**10**	**1.0**	**60**	**190**	< 0.95	**450 D**	**51**
	10/28/2016 Dup	**11**	**1.0**	**64**	**200**	<0.95	**420**	**45**
	4/11/2017	**2.4**	< 1.0	NA	**110 D**	NA	**180 D**	NA
	4/11/2017 Dup	**2.3**	< 1.0	NA	**99 D**	NA	**160 D**	NA
	10/5/2017	**7.0**	< 1.0	NA	**190**	NA	**240**	NA
	10/5/2017 Dup	**6.8**	< 1.0	NA	**160**	NA	**230**	NA
	4/25/2018	**1.4**	< 1.0	NA	**120**	NA	**120**	NA
	4/25/2018 Dup	**1.5**	< 1.0	NA	**130**	NA	**130**	NA
	10/2/2018	**1.8**	**1.6**	NA	**109 D**	NA	**192 D**	NA
	10/2/2018 Dup	**2.5**	**2.0**	NA	**89**	NA	**172**	NA
	4/15/2019	**0.98**	< 1.0	NA	NA	NA	**119 D**	NA
	4/15/2019 Dup	**0.64**	< 1.0	NA	NA	NA	**129 D**	NA
	10/15/2019	**1.75**	**1.99**	NA	NA	NA	**312**	NA
	4/9/2020	<0.300	<1.00	NA	NA	NA	**74.6 D**	NA
	10/20/2020	**1.70**	**1.13**	NA	NA	NA	**312 D**	NA
	4/12/2021	**1.18**	**1.82**	NA	NA	NA	**373 D**	NA
	10/6/2021	**2.18**	<1.00	NA	NA	NA	**375 D**	NA
	4/21/2022	<0.50 U	<0.50 U	NA	NA	NA	**110**	NA
MW-231	10/22/2009	**110**	**68,000**	**30 J**	**840**	<0.95	**2,300**	**14**
	4/22/2010	**48**	**18,000**	**14 J**	**410**	<0.95	**920**	**4.7**
	10/20/2010	**110**	**48,000**	**23**	**260**	<0.96	**710**	**2.5**
	10/11/2011	**50**	**48,000**	**13**	**560**	**<2.4**	**1,700**	**44**
	4/18/2012	**5.3**	**1,200**	<9.5	**32**	<0.95	**110**	**4.0**
	11/8/2012	**75**	**23,100**	**15 J**	**210**	<0.95	**730**	**5.5**
	4/11/2013	**25**	**14,000**	**22**	**220**	<0.95	**930**	**14**
	10/16/2013	**13**	**15,000**	**230 J**	**240**	<0.95	**820**	**3.9**
	4/15/2014	**9.1**	**6,200**	<9.5	**77**	<0.95	**370**	**3.4**
	10/23/2014	**< 60**	**6,600**	< 0.39 H	**450 H**	**0.86 JH**	**2,200 H**	**3.5 JH**
	4/22/2015	**< 21**	**3,600**	< 0.39	**320**	**1.3 JB**	**1,700**	**2.6 J**
	4/22/2015 Dup	**< 100**	**3,800**	< 0.39	**300**	**1.4 JB**	**1,800**	**3.8 J**
	10/19/2015	**13 D**	**14,000 D**	**11**	**200**	< 0.95	**1,700 D**	**3.3**
	4/11/2016	< 1.0	**52**	< 9.5	< 0.95	< 0.95	**1.3**	< 1.9
	4/11/2016 Dup	< 1.0	**63**	< 9.5	< 0.95	< 0.95	**5.5**	< 1.9
	10/27/2016	< 2.0	**1,800 D**	NA	**160**	NA	**850 D**	NA
	4/10/2017	< 1.0	**13**	NA	**17**	NA	**67.0**	NA
	10/4/2017	< 0.50	**3,600 D**	NA	**370 D**	NA	**1,200 D**	NA
	4/26/2018	< 1.0	< 1.0	NA	**5.6**	NA	**26**	NA
	10/2/2018	1.0	**1,110 D**	NA	**163**	NA	**639**	NA
	4/12/2019	**16.1**	**61.9**	NA	NA	NA	**1060 D**	NA
	10/15/2019	**1.1**	**2.68**	NA	NA	NA	**1190 D**	NA
	4/9/2020	**1,370 D**	**57,800 D**	NA	NA	NA	**91.0 D**	NA
	5/12/2020	**0.590**	<1.00	NA	NA	NA	NA	NA
	5/12/2020 Dup	**0.540**	<1.00	NA	NA	NA	NA	NA
	10/20/2020	**0.710**	**2.88**	NA	NA	NA	**1,670 D**	NA
	10/20/2020 Dup	**0.770**	**3.22**	NA	NA	NA	**1,650 D**	NA
	4/13/2021	< 0.300	< 1.00	NA	NA	NA	**56.1**	NA
	4/13/2021 Dup	< 0.300	< 1.00	NA	NA	NA	**52.9**	NA
	10/6/2021	**0.370**	**3.65**	NA	NA	NA	**51.1 D**	NA
	4/21/2022	**0.56**	<0.50 U	NA	NA	NA	**45**	NA
MW-232	10/22/2009	< 1.0	< 1.0	< 9.7 J	<0.97	<0.97	**280**	**7.3**
	4/22/2010	< 1.0	< 1.0	<10 J	< 1.0	< 1.0	**220**	**9.2**
	10/20/2010	< 1.0	< 1.0	<9.6	<0.96	<0.96	**260**	**3.5**
	10/10/2011	<1.0	< 1.0	<9.3	<0.93	<0.93	**190 J**	**10 J**
	4/19/2012	<1.0	< 1.0	<9.5	<0.95	**<2.4**	**110**	**3.3**
	11/8/2012	<1.0	< 1.0	**<9.5 UJ**	<0.95	<0.95	**200**	**7.0**
	4/10/2013	<1.0	< 1.0	11	<0.95	**1.9**	**160**	**6.7**
	10/15/2013	<1.0	< 1.0	<10 UJ	<1.0	<1.0	**130**	**23**
	4/16/2014	< 1.0	< 1.0	<9.5	<0.95	<0.95	**140**	8.3
	10/21/2014	< 0.06	NA	NA	NA	< 0.26	**92**	NA
	4/21/2015	< 0.42	NA	NA	NA	1.3 JB	**190**	NA
	10/20/2015	< 0.50	NA	NA	NA	< 0.95	**150**	NA
	4/13/2016	< 0.50	NA	NA	NA	< 0.95	**84**	NA
	10/27/2016	NA	NA	NA	NA	NA	**180**	NA
	4/11/2017	NA	NA	NA	NA	NA	**96**	NA
	10/5/2017	NA	NA	NA	NA	NA	**160**	NA
	4/25/2018	NA	NA	NA	NA	NA	**68**	NA
	10/1/2018	NA	NA	NA	NA	NA	**52 D**	NA
		MW-232 Ecy Approved Cease Sampling, Continue Water Level Gauging 11-14-18						

Table 2-2
NIA Groundwater Analytical Data (10/2007 – 4/2022)
Emerald Kalama Chemical, Kalama, WA

Well	Date	VOCs (µg/L) (EPA Method 8021B/8260)		SVOCs (µg/L) (EPA Method 8270C SIM)				
		Benzene	Toluene	Benzoic Acid	Biphenyl	Bis (2-ethylhexyl) phthalate	Diphenyl Oxide	Phenol
	Cleanup Level	**1.2**	**2,000**	**24,590**	**230**	**1.8**	**410**	**2,560**
MW-245	10/25/2007	**4.4**	< 1.0	<10 UJ	< 1.0	< 1.0	**870**	**18**
	4/17/2008	**3.2**	< 1.0	<9.6 UJ	<0.96	<0.96	**1,600**	**23**
	10/24/2008	< 1	< 1.0	NA	<0.98	<0.98	**700**	**17**
	4/20/2009	< 1.0	< 1.0	< 9.6 J	<0.96	<0.96	**770**	**12**
	10/22/2009	< 1.0	< 1.0	**< 9.6 J**	<0.96	<0.96	400	**7.3**
	4/22/2010	< 1.0	< 1.0	< 9.0 J	<0.99	<0.99	**470**	**14**
	10/21/2010	< 1.0	< 1.0	< 10	< 1.0	< 1.0	**320**	**15**
	10/10/2011	<1.0	< 1.0	<9.3	<0.93	<0.93	**330 J**	**12 J**
	4/19/2012	<1.0	< 1.0	<9.5	<0.95	**<2.4**	**350**	**8.3**
	11/7/2012	<1.0	< 1.0	<9.5 UJ	<0.95	<0.95	**180**	**2.1**
	4/10/2013	<1.0	< 1.0	<9.6	<0.96	<0.96	**260**	**7.5**
	10/16/2013	<1.0	< 1.0	<9.5 UJ	<0.95	<0.95	**150**	**5.7**
	4/15/2014	< 1.0	< 1.0	<9.5	<0.95	**21**	**130**	3.0
	10/21/2014	< 0.06	NA	NA	NA	< 0.26	**140**	NA
	4/21/2015	< 0.42	NA	NA	NA	**1.1 JB**	**200**	NA
	10/20/2015	< 0.50	NA	NA	NA	< 0.95	**77**	NA
	4/13/2016	< 0.50	NA	NA	NA	< 0.95	**180**	NA
	10/27/2016	NA	NA	NA	NA	< 0.96	**140**	NA
	4/11/2017	NA	NA	NA	NA	< 0.95	**130**	NA
	10/5/2017	NA	NA	NA	NA	< 2.5	**96**	NA
	4/26/2018	NA	NA	NA	NA	< 0.96	**120**	NA
	10/1/2018	NA	NA	NA	NA	< 0.50	**81**	NA
	4/12/2019	NA	NA	NA	NA	NA	**161 D**	NA
	10/15/2019	NA	NA	NA	NA	NA	**74**	NA
	4/7/2020	NA	NA	NA	NA	NA	**124 D**	NA
	10/20/2020	NA	NA	NA	NA	NA	**97.5 D**	NA
	4/12/2021	NA	NA	NA	NA	NA	**105 D**	NA
	10/4/2021	NA	NA	NA	NA	NA	**101 D**	NA
	4/21/2022	NA	NA	NA	NA	NA	**97**	NA
MW-256	10/25/2007	< 1.0	< 1.0	<11 UJ	< 1.1	< 1.1	**200**	**6.6**
	4/17/2008	< 1.0	< 1.0	**< 9.5 UJ**	<0.95	<0.95	**120**	**1.9**
	10/28/2008	< 1.0	< 1.0	17 J	<0.95	<0.95	**150**	4.7
	4/20/2009	< 1.0	< 1.0	<9.6 J	<0.96	<0.96	**47**	< 2
	10/22/2009	< 1.0	< 1.0	<9.5 J	<0.95	<0.95	**22**	<1.9
	4/22/2010	< 1.0	< 1.0	<9.0 J	<0.95	<0.95	**28**	<1.0
	10/21/2010	< 1.0	< 1.0	<9.9	<0.99	<0.99	**25**	<2.0
	10/10/2011	< 1.0	< 1.0	<9.3	<0.93	<0.93	**31 J**	<1.9
	4/18/2012	< 1.0	< 1.0	<9.7	<0.97	**<2.4**	**5.9**	<2.0
	11/8/2012	< 1.0	< 1.0	<9.5 UJ	<0.95	<0.95	**23**	<1.9
	4/10/2013	< 1.0	< 1.0	<9.5	<0.95	<0.95	**5.6**	<1.9
	10/16/2013	< 1.0	< 1.0	<9.5 UJ	<0.95	<0.95	**23**	<1.9
	4/15/2014	< 1.0	< 1.0	<9.5	<0.95	<0.95	**24**	<1.9
	10/21/2014	< 0.06	NA	NA	NA	NA	**27**	NA
	4/21/2015	< 0.42	NA	NA	NA	NA	**26**	NA
	10/20/2015	< 0.50	NA	NA	NA	NA	**16**	NA
	4/13/2016	< 0.50	NA	NA	NA	NA	**30**	NA
	10/27/2016	NA	NA	NA	NA	NA	**10**	NA
	4/11/2017	NA	NA	NA	NA	NA	**1.5**	NA
	10/5/2017	NA	NA	NA	NA	NA	**23**	NA
	4/26/2018	NA	NA	NA	NA	NA	**5.0**	NA
	10/1/2018	NA	NA	NA	NA	NA	**14.9**	NA
	4/12/2019	NA	NA	NA	NA	NA	**17.5**	NA
	10/15/2019	NA	NA	NA	NA	NA	**21.3**	NA
	4/7/2020	NA	NA	NA	NA	NA	<0.517	NA
	10/20/2020	NA	NA	NA	NA	NA	**21.6**	NA
	4/12/2021	NA	NA	NA	NA	NA	**8.64**	NA
	10/4/2021	NA	NA	NA	NA	NA	**8.24 D**	NA
	4/21/2022	NA	NA	NA	NA	NA	**14**	NA
KC-9	10/22/2009	**28**	**1.7**	< 9.5 J	**1300**	< 0.95	**5,400**	**21**
	4/23/2010	**5**	< 1.0	< 9.0 J	**170**	< 0.98	**730**	**7.4**
	10/21/2010	**14**	< 1.0	< 9.6	**840**	< 0.96	**3,600**	**18**
	10/10/2011	**10**	<1.0	<9.3	**420**	**<2.4**	**1,900**	**21**
	4/18/2012	**3.6**	<1.0	<9.5	**150**	<0.93	**600**	**8.7**
	11/8/2012	**2.2**	<1.0	<9.5 UJ	**170**	<0.95	**1,000**	**10**
	4/10/2013	**3.7**	< 1.0	**11**	**110**	<0.95	**810**	**5.1**
	10/16/2013	**4.3**	< 1.0	<9.5 UJ	**99**	<0.95	**1,300**	**6.6**
	4/15/2014	**2.8**	< 1.0	<9.5	**51**	<0.95	**740**	**6.4**
	10/21/2014	**Inaccessible due to construction; not sampled**						
	4/21/2015	**5.8**	< 0.44	**5.4 J**	**150**	**1.2 JB**	**1,300**	**9.4 J**
	10/20/2015	**18**	< 1.0	< 9.5	**570 D**	< 0.95	**4,000 D**	**25**
	4/13/2016	**3.5**	< 1.0	< 9.5	**100**	**< 0.95**	**690 D**	**12**
	10/27/2016	**3.0**	< 1.0	NA	**120**	**NA**	**1,800 D**	NA
	4/11/2017	**1.3**	< 1.0	NA	**62**	NA	**810 D**	NA
	10/5/2017	**2.2**	< 1.0	NA	**73**	NA	**1,900 D**	NA
	4/26/2018	**2.9**	< 1.0	NA	**57**	NA	**1,600 D**	NA
	10/1/2018	**4.9**	< 1.0	NA	**53 D**	NA	**2,010 D**	NA
	4/15/2019	**2.09**	< 1.0	NA	NA	NA	**5,980 D**	NA
	10/15/2019	**3.58**	<1.00	NA	NA	NA	**3,290 D**	NA
	4/7/2020	<0.300	<1.00	NA	NA	NA	**1,930 D**	NA
	10/20/2020	**2.79**	<1.00	NA	NA	NA	**2,660 D**	NA
	4/12/2021	**2.37**	<1.00	NA	NA	NA	**2,870 D**	NA
	10/4/2021	**2.96**	<1.00	NA	NA	NA	**2,630 D**	NA
	4/19/2022	**1.0**	< 0.50 U	NA	NA	NA	**1,400 D**	NA
PDW-117	10/22/2009	**21**	**5.4**	**36 J**	**750**	**6.5**	**1,700**	**6.2**
	4/22/2010	**< 1.0**	< 1.0	<9.0 J	**47**	<0.95	**140**	**5.6**
	10/20/2010	**5.7**	< 1.0	<9.9	**180**	<0.99	**970**	**15**
	10/11/2011	**7.6**	< 1.0	<9.5	**57**	**<2.4**	**400**	**8.4**
	4/18/2012	**1.1**	< 1.0	<9.5	**41**	<0.95	**180**	**4.4**
	11/8/2012	**23**	< 1.0	<9.5 UJ	**48**	<0.95	**360**	**20**
	4/11/2013	**4.4**	< 1.0	<9.5	**160**	<0.95	**1,200**	**6.3**
	10/15/2013	**5.9**	< 1.0	< 10 UJ	**150**	<1.0	**1,000**	**12**
	4/16/2014	**4.7**	< 1.0	<9.5	**59**	<0.95	**740**	**6.3**
	10/23/2014	**7**	**0.23 J**	**4.8 JH**	**22 H**	< 0.26 H	**1,700 H**	**8.6 JH**
	4/22/2015	**3.6**	< 0.44	< 0.40	**8.7**	< 0.26	**1,900**	**16**
	10/20/2015	**7.1**	< 1.0	< 9.5	**34**	< 0.95	**2,500 D**	**19**
	4/13/2016	< 1.0	< 1.0	< 9.5	**38**	< 0.95	**310 D**	**4.9**
	10/28/2016	< 1.0	< 1.0	NA	**1.0**	NA	**140**	NA
	4/11/2017	< 1.0	< 1.0	NA	**7.9**	NA	**150**	NA
	10/5/2017	**2**	< 1.0	NA	< 0.97	NA	**540 D**	NA
	4/26/2018	< 1.0	< 1.0	NA	< 0.96	NA	**1,700 D**	NA
	10/2/2018	**2.6**	< 1.0	NA	**9.6 D**	NA	**524 D**	NA
	4/15/2019	**0.99**	< 1.0	NA	NA	NA	**4,600 D**	NA
	10/15/2019	**2.06**	<1.00	NA	NA	NA	**1950 D**	NA
	4/9/2020	**0.860**	<1.00	NA	NA	NA	**2040 D**	NA
	4/9/2020 Dup	**0.930**	<1.00	NA	NA	NA	**1560 D**	NA
	10/20/2020	**0.500**	<1.00	NA	NA	NA	**1,570 D**	NA
	4/12/2021	< 0.300	< 1.00	NA	NA	NA	**1,070 D**	NA
	10/4/2021	**0.680**	<1.00	NA	NA	NA	**1,030 D**	NA
	4/19/2022	< 0.50 U	< 0.50 U	NA	NA	NA	**1,300 D**	NA

Table 2-2
NIA Groundwater Analytical Data (10/2007 – 4/2022)
Emerald Kalama Chemical, Kalama, WA

Well	Date	VOCs (µg/L) (EPA Method 8021B/8260)		SVOCs (µg/L) (EPA Method 8270C SIM)				
		Benzene	Toluene	Benzoic Acid	Biphenyl	Bis (2-ethylhexyl) phthalate	Diphenyl Oxide	Phenol
	Cleanup Level	**1.2**	**2,000**	**24,590**	**230**	**1.8**	**410**	**2,560**
East Sump	7/25/2007	**7.5**	**30**	< 9.5 U	**29**	<0.95 U	**910 D**	**8**
	10/24/2007	**6**	**16**	< 9.0 UJ	**13**	<0.96	**960**	**11**
	1/17/2008	**9.7 D**	**160 D**	< 9.5 U	**13**	<0.95 U	**650 D**	**8.1**
	4/15/2008	**12**	**710**	< 9.5 UJ	**19**	<0.95	**730**	**27**
	7/28/2008	**5.6**	**69**	< 9.6	**21**	<0.96	**600**	**5.6**
	10/24/2008	**7.9**	**57**	NA	**17**	<0.97	**1,200**	**14**
	1/30/2009	**2.3**	< 1	< 9.5	**13**	<0.95	**580**	**6.2**
	4/20/2009	**4.3**	79	< 9.6 J	**7.6**	<0.96	**590**	**3.6**
	10/21/2009	**2.4**	< 1.0	< 11 J	**3.4**	< 1.1	**500**	**15**
	4/22/2010	**1.9**	< 1.0	< 10 J	**4.4**	< 1.0	**330**	**4.4**
	10/21/2010	**14**	< 1.0	< 10	**6.7**	< 1.0	**760**	**18**
	10/10/2011	**9.7**	< 1.0	<9.5	**3.3 J**	<0.95	**310 J**	**5.1 J**
	4/19/2012	**1.9**	< 1.0	<9.5	**4.4**	<2.4	**280**	<1.9
	11/7/2012	<1.0	< 1.0	<9.5 UJ	**2.4**	<0.95	**220**	**2.4**
	4/10/2013	<1.0	< 1.0	<9.5	**2.0**	<0.95	**200**	**2.8**
	10/16/2013	<1.0	< 1.0	<9.5 UJ	**1.8**	<0.95	**260**	**2.8**
	4/14/2014	< 1.0	< 1.0	<9.5	**1.6**	<0.95	**190**	<1.9
	10/21/2014	< 0.06	< 0.11	NA	NA	NA	**200**	NA
	4/20/2015	< 0.42	**1.2 J**	NA	NA	NA	**150**	NA
	10/20/2015	< 1.0	< 1.0	NA	NA	NA	<0.95	NA
	4/13/2016	< 1.0	< 1.0	NA	NA	NA	**260 D**	NA
	10/27/2016	< 1.0	< 1.0	NA	NA	NA	**53**	NA
	4/10/2017	< 1.0	< 1.0	NA	NA	NA	**170**	NA
	10/4/2017	< 0.50	< 1.0	NA	NA	NA	**360 D**	NA
	4/23/2018	< 1.0	< 1.0	NA	NA	NA	**140**	NA
	10/2/2018	< 0.3	< 1.0	NA	NA	NA	**92 D**	NA
	4/12/2019	< 0.3	< 1.0	NA	< 0.644	NA	**112**	NA
	10/15/2019	<0.300	<1.00	NA	<0.473	NA	**266**	NA
	4/7/2020	<0.300	<1.00	NA	<0.475	NA	**80.5 D**	NA
	10/19/2020	**54.5**	<1.00	NA	<0.481	NA	**216 D**	NA
	10/19/2020 Dup	**55.1**	<1.00	NA	<0.483	NA	**278**	NA
	1/15/2021	**5.98**	<1.00	NA	NA	NA	NA	NA
	4/8/2021	**15.5**	<1.00	NA	<0.479	NA	**117 D**	NA
	7/16/21 ALS 8260	**2.0**	<0.50 U	NA	NA	NA	NA	NA
	7/16/21 Spclty 802	**2.19**	**1.15**	NA	NA	NA	NA	NA
	10/1/2021 Spclty 8	<0.300	<1.00	NA	<0.473	NA	**104 H (lab)**	NA
	10/1/2021 DUP	<0.300	<1.00	NA	<0.474	NA	NA	NA
	4/14/2022 ALS	<0.50 U	<0.50 U	NA	<0.94	NA	**99**	NA
	4/14/2022 DUP	<0.50 U	<0.50 U	NA	<0.94	NA	**99**	NA
West Sump	7/25/2007	**270 D**	**1,900 D**	**12**	**180 D**	<0.95 U	**1,600 D**	**9.5**
	7/25/2007 Dup	**270 D**	**1,500 D**	**11**	**160 D**	**2.5**	**1,600 D**	**14**
	10/24/2007	**270 J**	**1,300 J**	**32 J**	**190**	<0.96	**2,200**	**22 J**
	10/24/2007 Dup	**450 J**	**2,000 J**	**20 J**	**210**	<0.95	**2,100**	**16 J**
	1/17/2008	**410 D**	**8,300 D**	9.8	**45**	<0.96 U	**620 D**	**62 D**
	1/17/2008 Dup	**400 D**	**7,900 D**	< 9.7 U	**42**	<0.97 U	**600 D**	**55 D**
	4/15/2008	**79**	**820**	< 9.5 UJ	**160**	**1.1**	**1,200**	**8.7**
	4/15/2008 Dup	**83**	**780**	< 9.5 UJ	**160**	<0.95	**1,200**	**8.4**
	7/28/2008	**200**	**740**	< 9.5	**140**	<0.95	**1,300**	**18**
	7/28/2008 Dup	**200**	**740**	< 9.5	**140**	<0.95	**1,200**	**21**
	10/24/2008	**140**	**1,700**	**26 J-**	**110**	<0.95	**1,000**	**15**
	1/30/2009	**160**	**1,400**	26	**78**	<0.95	**880**	**2.5**
	1/30/2009 Dup	**150**	**1,300**	< 9.5	**110**	<0.95	**870**	**17**
	4/20/2009	**26**	**78**	< 9.6 J	**150**	<0.96	**1,100**	**5.7**
	4/20/2009 Dup	**27**	**78**	< 9.6 J	**130**	<0.96	**1,000**	**5.3**
	10/20/2009	**100**	**1,100**	< 9.5 J	**5.0 J**	<0.95	**570 J**	**31**
	10/21/2009 Dup	**100**	**1,100**	< 9.5 J	**59 J**	<0.95	**970 J**	**28**
	4/22/2010	**56**	**77**	< 9.0 J	**46**	<0.95	**490**	**5**
	4/22/2010 Dup	**59**	**85**	< 9.0 J	**45**	<0.99	**490**	**6.8**
	10/21/2010	**42**	**69**	< 9.8	**15**	< 0.98	**470**	**100**
	10/10/2011	**33**	**210**	<9.5	**45 J**	<0.95	**730 J**	**8.7 J**
	10/10/2011 Dup	**33**	**210**	<9.3	**23 J**	<0.93	**560 J**	**20 J**
	4/19/2012	**71**	**230**	<9.5	**27**	**< 2.4**	**320**	**4.2**
	4/19/2012 Dup	**71**	**230**	<9.5	**27**	**< 2.4**	**310**	**4.3**
	11/7/2012	**52**	**109**	<9.5 UJ	**49**	<0.95	**760**	**6.1**
	11/7/2012 Dup	**48**	**101**	<9.5 UJ	**46**	<0.95	**750**	**6.1**
	4/10/2013	**34**	**23**	**12**	**42**	<0.95	**410**	**5.0**
	4/10/2013 Dup	**34**	**22**	**9.8**	**42**	<0.95	**430**	**5.3**
	10/16/2013	**33**	**18**	<9.5	**45**	<0.95	**770**	**4.6**
	10/16/2013 Dup	**33**	**19**	<9.5	**42**	<0.95	**750**	**5.1**
	4/14/2014	**67**	**120**	<9.5 UJ	**47**	<0.95	**520**	**7.4**
	4/14/2014 Dup	**72**	**120**	<9.5 UJ	**46**	<0.95	**520**	**8.4**
	10/21/2014	**4.4**	**0.91**	NA	NA	NA	**830**	NA
	10/21/2014 Dup	**4.4**	**0.85**	NA	NA	NA	**980**	NA
	4/20/2015	**56**	**60**	NA	NA	NA	**550**	NA
	10/20/2015	**4.4**	< 1.0	NA	NA	NA	200	NA
	10/20/2015 Dup	4.5	< 1.0	NA	NA	NA	**200**	NA
	4/13/2016	**74**	**51**	NA	NA	NA	**180**	NA
	4/13/2016 Dup	**71**	**50**	NA	NA	NA	**190**	NA
	10/27/2016	**5.0**	**5.5**	NA	NA	NA	**1,100 D**	NA
	10/27/2016 Dup	**6.1**	**7.1**	NA	NA	NA	**1,100 D**	NA
	4/10/2017	**65 D**	**40 D**	NA	NA	NA	**100**	NA
	4/10/2017 Dup	**68 D**	**42 D**	NA	NA	NA	**100**	NA
	10/4/2017	**2.7**	**3.7**	NA	NA	NA	**790 D**	NA
	10/4/2017 Dup	**2.8**	**3.4**	NA	NA	NA	**770 D**	NA
	4/23/2018	**21**	**8.6**	NA	NA	NA	**300 D**	NA
	4/23/2018 Dup	**21**	**8.6**	NA	NA	NA	**300 D**	NA
	10/2/2018	**3.3**	**< 1.0**	NA	NA	NA	**844 D**	NA
	10/2/2018 Dup	**2.9**	**< 1.0**	NA	NA	NA	**595 D**	NA
	4/12/2019	**18.2**	**11.8**	NA	**37.8**	NA	**898 D**	NA
	4/12/2019 Dup	**18.6**	**12.4**	NA	**37.8**	NA	**962 D**	NA
	10/15/2019	**1.11**	<1.00	NA	**22.1**	NA	**996 D**	NA
	10/15/2019 Dup	**1.16**	<1.00	NA	**24.1**	NA	**1020 D**	NA
	4/7/2020	**9.57**	**11.8**	NA	**11.9**	NA	**532 D**	NA
	4/7/2020 Dup	**9.69**	**10.7**	NA	**12.9**	NA	**603 D**	NA
	10/19/2020	**0.970**	<1.00	NA	**13.1**	NA	**874 D**	NA
	1/15/2021	**15.2**	**2.45**	NA	**NA**	NA	**NA**	NA
	4/8/2021	**4.51**	**1.86**	NA	**8.82**	NA	**690 D**	NA
	10/1/2021	**0.500**	<1.00	NA	<0.474	NA	**119 H (lab)**	NA
	4/14/2022	**2.7**	<0.50 U	NA	**5.4**	NA	**400 D**	NA

Notes:
< - Result is non-detected above the laboratory detection limit.
< - Detection limit above cleanup level.
Bold indicates detection.
Dup - Field Duplicate Sample.
NA - Not analyzed per Ecology approval.
J - Estimated concentration.
UJ - Not detected, estimate concentration.
Bold and shaded Detection above cleanup level.
EPA = U.S. Environmental Protection Agency; µg/L micrograms per liter; mg/L = milligrams per liter; NIA = North Impacted Area;

Table 2-3
NIA Interception Trench Sump Pump Operation Data (2021-2022)
Emerald Kalama Chemical, Kalama, WA

Current Reporting Year: Monthly Data	Total Groundwater Extracted			Days of Operation	Average Flow Rate[1]	
	East Sump (gallons)	West Sump (gallons)	Combined (gallons)		(gallons per day)	(gallons per minute)
April 2022	2,075,648	1,242,962	3,318,610	29	114,435	79
March 2022	2,659,607	1,730,973	4,390,580	35	125,445	87
February 2022	1,578,331	1,517,279	3,095,610	28	110,558	77
January 2022	1,833,124	1,186,306	3,019,430	28	107,837	75
December 2021	2,125,359	1,362,671	3,488,030	28	124,573	87
November 2021	1,785,593	1,207,297	2,992,890	34	88,026	61
October 2021	554,670	630,720	1,185,390	34	34,864	24
September 2021	449,749	404,460	854,209	28	30,507	21
August 2021	456,969	530,632	987,601	28	35,271	24
July 2021	673,218	602,952	1,276,170	29	44,006	31
June 2021	1,232,558	983,642	2,216,200	34	65,182	45
May 2021	1,303,734	876,320	2,180,054	29	75,174	52
Data by Year (1999 – 2022)						
May 2021 - April 2022 Total			29,004,774	364	79,683	55
May 2020 - April 2021 Total			29,012,846	364	79,706	55
May 2019 - April 2020 Total			25,672,040	364	70,528	49
May 2018 - April 2019 Total			26,892,240	365	73,677	51
May 2017 - April 2018 Total			34,527,000	365	94,595	66
May 2016 - April 2017 Total			27,211,420	357	76,222	53
May 2015 - April 2016 Total			22,279,780	364	61,208	43
May 2014 - April 2015 Total			28,283,351	364	77,702	54
May 2013 - April 2014 Total			26,146,043	364	71,830	50
May 2012 - April 2013 Total			32,377,430	367	88,222	61
May 2011 - April 2012 Total			29,560,750	364	81,211	56
May 2010 - April 2011 Total			27,198,659	364	74,722	52
May 2009 - April 2010 Total			23,801,041	365	66,114	46
May 2008 - April 2009 Total			24,827,910	365	68,022	47
May 2007 - April 2008 Total			24,318,988	366	66,493	46
May 2006 - April 2007 Total			30,981,555	365	85,000	59
May 2005 - April 2006 Total			28,741,209	365	78,986	55
May 2004 - April 2005 Total			22,890,809	365	62,791	44
May 2003 - April 2004 Total			25,980,637	366	71,036	49
May 2002 - April 2003 Total			22,689,839	363	62,700	44
May 2001 - April 2002 Total			18,336,898	365	50,465	35
May 2000 - April 2001 Total			16,158,522	365	44,230	31
May 1999 - April 2000 Total			27,663,437	366	75,565	53
		Averages:	27,479,872		75,487	52

Notes:

[1] Calculated based on weekly totalizer readings.

NIA = North Impacted Area

Table 2-4
NIA Discharge Data (2021 – 2022)
Emerald Kalama Chemical, Kalama, WA

East Sump

Chemical Name	Average Concentration (µg/L)*		May 2021 - October 2021 Contaminant Removal (lb)	November 2021 - April 2022 Contaminant Removal (lb)	Total Removal (lb)
	10/1/2021	4/14/2022			
Volatile Organic Compounds (EPA Method 8260)					
Benzene	0	0	0.00	0.00	0.00
Toluene	0	0	0.00	0.000	0.00
Semivolatile Organic Compounds (EPA Method 8270 mod.)					
Diphenyl Oxide	**104**	**99**	3.57	8.25	11.82

West Sump

Chemical Name	Average Concentration (µg/L)*		May 2021 - October 2021 Contaminant Removal (lb)	November 2021 - April 2022 Contaminant Removal (lb)	Total Removal (lb)
	10/1/2021	4/14/2022			
Volatile Organic Compounds (EPA Method 8260)					
Benzene	**0.5**	**2.7**	0.01	0.16	0.17
Toluene	**0**	**0**	0.00	0.00	0.00
Semivolatile Organic Compounds (EPA Method 8270 mod.)					
Diphenyl Oxide	**119**	**400**	3.37	23.38	26.76

Total

Chemical Name	May 2021 - October 2021 Contaminant Removal (lb)	November 2021 - April 2022 Contaminant Removal (lb)	Total Removal (lb)
Volatile Organic Compounds (EPA Method 8260)			
Benzene	0.01	0.16	0.2
Toluene	0.00	0.00	0.0
Semivolatile Organic Compounds (EPA Method 8270 mod.)			
Diphenyl Oxide	6.95	31.63	38.6

Notes:
East Sump groundwater extracted = 14,098,242
West Sump groundwater extracted = 10,402,532
***Chemical concentrations are average for the period (May&Oct, Oct&April)**
Contaminant removal results are rounded.
EPA = U.S. Environmental Protection Agency; lb = pound; µg/L = micrograms per liter; NIA = North Impacted Area

Table 3-1
WIA Shallow Interception Trench Monitoring Program 2021 - 2022
Emerald Kalama Chemical, Kalama, WA

Well Location	Sampling Frequency	Field Parameters	Analytical Parameters	Gauging Frequency
KC-13, KC-24R, PZ-110, MW-238, MW-255, N&S Sumps	—	—	—	Semiannually
PZ-104, PZ-107	Semiannually	Temperature, pH, ORP, conductivity, turbidity, DO	Benzene, Toluene, Biphenyl, DEHP, DPO	
USRW-2	Semiannually	Temperature, pH, ORP, conductivity, turbidity, DO	DPO	

Notes:
DO = dissolved oxygen; ORP = oxidation reduction potential; DPO = Diphenyl Oxide; DEHP = Bis (2-ethylhexyl) phthalate.
Ecy 11-28-17 Approval of EKC recommendation: Remove Well KC-11 from sampling and gauging list (already sampled Oct 2017)

Table 3-2
WIA Upper Sand Analytical Data (10/2007 – 4/2022)
Emerald Kalama Chemical, Kalama, WA

Well	Date	VOCs (µg/L) (EPA Method 8021B / 8260)		SVOCs (µg/L) (EPA Method 8270C SIM)				
		Benzene	Toluene	Benzoic Acid	Biphenyl	Bis (2-ethylhexyl) phthalate	Diphenyl Oxide	Phenol
	Cleanup Level	**1.2**	**2,000**	**24,590**	**230**	**1.8**	**410**	**2,560**
PZ-104	10/20/2009	**5.8**	< 1.0	<9.7 J	**550**	<0.97	**3,600**	**12**
	4/23/2010	**4.5**	< 1.0	<9.0 J	**180**	<0.95	**2,600**	**8.6**
	10/20/2010	**8.3**	< 1.0	< 10	**260**	< 1.0	**4,100**	**83**
	10/10/2011	**7.7**	< 1.0	<9.5	**150**	**<2.4**	**4,700**	**69**
	4/19/2012	**5.8**	< 1.0	<9.5	**29**	<0.95	**3,600**	**37**
	11/8/2012	**9.2**	< 1.0	<9.5 UJ	**36**	<0.95	**4,600**	**80**
	4/11/2013	**5.5**	< 1.0	<9.5	**47**	<0.95	**3,100**	**30**
	10/16/2013	**5.5**	< 1.0	<9.5 UJ	**4.9**	<0.95	**2,600**	**38**
	4/15/2014	**2.9**	< 1.0	<9.5	**13**	<0.95	**2,400**	**37**
	10/23/2014	**5.3**	< 0.11	< 0.40 H	**10 H**	< 0.26 H	**4,800 H**	**38 H**
	4/22/2015	**3**	< 0.44	< 0.40	**6.4**	**1.3 JB**	**3000**	**52**
	4/22/2015 Dup	**3**	< 0.44	< 0.39	**6.3**	**1.2 JB**	**3100**	**46**
	10/20/2015	**1.9**	< 1.0	< 9.5	**2.3**	< 0.95	**3,300 D**	**48**
	4/12/2016	< 1.0	< 1.0	< 9.5	**2.8**	**69**	**1,700 D**	**31**
	10/28/2016	**1.9**	< 1.0	NA	< 0.95	< 0.95	**3,700 D**	NA
	4/12/2017	< 0.50	< 1.0	NA	**2.2**	< 0.95	**1,600**	NA
	10/5/2017	**2.2**	< 1.0	NA	**4.7**	< 2.5	**2,800 D**	NA
	4/25/2018	< 1.0	< 1.0	NA	< 0.96	< 0.96	**1,600 D**	NA
	10/2/2018	**4.3**	**6.8**	NA	**50.2 D**	< 4.7 D	**3,620 D**	NA
	4/15/2019	**12.2**	< 1.0	NA	**381 D**	< 0.505	**8,350 D**	NA
	10/15/2019	**5.29**	<1.00	NA	**0.665**	<0.475	**2,740 D**	NA
	4/9/2020	**9.28**	<1.00	NA	**79.7 D**	**47.3 D**	**4,740 D**	NA
	5/12/2020	NA	NA	NA	**268 D**	<0.484	**12,100 D**	NA
	10/20/2020	**1.65**	<1.00	NA	**16.6**	<0.478	**3,140 D**	NA
	10/20/2020 Dup M	**1.66**	<1.00	NA	**22.4 D**	<0.479	**3,420 D**	NA
	4/12/2021	**5.67**	<1.00	NA	**86.1**	<0.478	**4,530 D**	NA
	10/4/2021	**0.970**	<1.00	NA	**81.5 D**	<47.9 D	**4,300 D**	NA
	10/4/2021 Dup	**0.760**	<1.00	NA	**3,430 D****	<47.8 D	**4,080 D****	NA
	4/21/2022	**1.7**	<0.50 U	NA	**54**	<1.9 U	**3,300 D**	NA
	4/21/2022 Dup 4	**1.6**	<0.50 U	NA	**44**	<1.9 U	**2,900 D**	NA
PZ-107	10/22/2009	**NA**	**NA**	**NA**	**NA**	NA	**NA**	NA
	4/23/2010	**5.3**	**590**	**1,300 J**	**1,500**	**<4.0**	**3,600**	**210**
	10/20/2010	**37**	**5,300**	**4,300**	**24,000**	**<200**	**65,000**	< 390
	10/11/2011 [s]	**100**	**5,300**	**38,000**	**110,000**	**3.4**	**300,000**	**220**
	4/19/2012 [s]	**18**	**130**	**7,400**	**1,700**	**600**	**4,300**	**140**
	11/7/2012 [s]	**19**	**227**	**900 J**	**4,400**	**30**	**12,000**	**41**
	4/11/2013 [s]	**160**	**2,000**	**8,000**	**140,000**	**1,200**	**330,000**	**270**
	10/16/2013 [s]	**13**	**200**	**450 J**	**1,200**	**6.4**	**4,400**	**40**
	4/15/2014 [s]	**5.5**	**57**	**640**	**1,000**	**<9.5**	**2,800**	**53**
	10/23/2014 [s]	**Not sampled**						
	4/23/2015 [s]	**6.6**	**82**	**2100**	**720**	**6.2 B**	**2,200**	**19**
	10/20/2015 [s]	**12**	**530 D**	**2,600 D**	**5,700 D**	**62 D**	**20,000 D**	< 48
	4/12/2016	**2.5**	**30**	**1,200 D**	**930 D**	<0.95	**2,300 D**	**36**
	10/28/2016	< 1.0	**6.8**	NA	**760 D**	< 0.96	**2,100 D**	NA
	4/12/2017	**0.62**	**15**	NA	**860 D**	< 9.5	**1,900 D**	NA
	10/5/2017	**1.2**	**32 D**	NA	**440 D**	2.7	**1,100 D**	NA
	4/25/2018	< 1.0	**1.7**	NA	**670 D**	< 9.6	**1,600 D**	NA
	10/3/2018	< 0.30	**3.9**	NA	**404 D**	< 4.7 D	**936 D**	NA
	4/15/2019	< 0.30	< 1.0	NA	**269 D**	<0.625	**622 D**	NA
	10/15/2019	<0.300	**1.45**	NA	**209**	<0.473	**1,080 D**	NA
	4/9/2020	<0.300	<1.00	NA	**22.1**	**1.08**	**176 D**	NA
	5/12/2020	NA	NA	NA	**159 D**	<0.487	**1,430 D**	NA
	10/20/2020	<0.300	<1.00	NA	**261 D**	<0.480	**649 D**	NA
	4/12/2021	<0.300	**3.67**	NA	**33.4**	<0.478	**85.8 D**	NA
	10/4/2021	<0.300	<1.00	NA	**60.9**	<0.345	**21.8**	NA
	4/21/2022	<0.50 U	<0.50 U	NA	**17**	<1.9 U	**64**	NA
MW-244	10/24/2007	**1.1**	< 1.0	< 9.8 UJ	< 0.98	< 0.98	**720**	**30**
	4/17/2008	**1.1**	< 1.0	< 9.7 UJ	< 0.97	< 0.97	**560**	**16**
	10/27/2008	**3**	< 1.0	**11 J**	< 0.95	< 0.95	**960**	**20**
	4/22/2009	**1**	< 1.0	< 9.6 J	< 0.96	< 0.96	**1,300**	**9.1**
	10/20/2009	**1.3**	< 1.0	< 9.8 J	< 0.98	< 0.98	**820**	**41**
	4/22/2010	< 1.0	< 1.0	< 9.0 J	< 0.98	< 0.98	**1,000**	**38**
	10/19/2010	< 1.0	< 1.0	< 9.6	< 0.96	< 0.96	**340**	**5.7**
	10/11/2011	< 1.0	< 1.0	<9.5	<0.95	<0.95	**68**	<1.9
	4/18/2012	< 1.0	**2,400**	<9.5	<0.95	**<2.4**	**550**	**4.8**
	11/8/2012	< 1.0	< 1.0	<9.5 UJ	<0.95	<0.95	**590**	**7.8**
	11/8/2012 Dup	< 1.0	< 1.0	<9.5 UJ	<0.95	<0.95	**600**	**8.4**
	4/11/2013	< 1.0	< 1.0	<9.5	<0.95	<0.95	**530**	**14**
	4/11/2013 Dup	< 1.0	< 1.0	<9.5	<0.95	<0.95	**610**	**14**
	10/17/2013	< 1.0	< 1.0	<9.5 UJ	<0.95	<0.95	**410**	**8.2**
	4/15/2014	< 1.0	< 1.0	<9.5	<0.95	<0.95	**600**	**9.4**
	10/22/2014	**0.12 J**	< 0.11	NA	NA	< 0.28	**570**	NA
	4/21/2015	< 0.42	< 0.44	NA	NA	**1.2 JB**	**450**	NA
	10/20/2015	NA	NA	NA	NA	NA	**780 D**	NA
	4/13/2016	NA	NA	NA	NA	NA	**190**	NA
	10/27/2016	NA	NA	NA	NA	NA	**470 D**	NA
	4/11/2017	NA	NA	NA	NA	NA	**68**	NA
	10/3/2017	NA	NA	NA	NA	NA	**330 D**	NA
	4/24/2018	NA	NA	NA	NA	NA	**340 D**	NA
	10/1/2018	NA	NA	NA	NA	NA	**207**	NA
	4/15/2019	NA	NA	NA	NA	NA	**269 D**	NA
	10/15/2019	NA	NA	NA	NA	NA	**79.7 D**	NA
	4/9/2020	NA	NA	NA	NA	NA	**156 D**	NA
	Cease sampling Oct 2020 Sampling Round Per Ecy 10/21/20 Approval							

Table 3-2
WIA Upper Sand Analytical Data (10/2007 – 4/2022)
Emerald Kalama Chemical, Kalama, WA

Well	Date	VOCs (µg/L) (EPA Method 8021B / 8260)		SVOCs (µg/L) (EPA Method 8270C SIM)				
		Benzene	Toluene	Benzoic Acid	Biphenyl	Bis (2-ethylhexyl) phthalate	Diphenyl Oxide	Phenol
	Cleanup Level	**1.2**	**2,000**	**24,590**	**230**	**1.8**	**410**	**2,560**
KC-11	10/20/2009 *	NS	NS	NS	NS	NS	NS	NS
	4/23/2010 *	NS	NS	NS	NS	NS	NS	NS
	10/11/2011	< 1.0	**2.8**	**26**	**28**	**<9.9**	**160**	<9.9
	4/19/2012	**1.4**	< 1.0	<9.5	<0.95	**<2.4**	**4.6**	<1.9
	11/7/2012 *	NS	NS	NS	NS	NS	NS	NS
	4/10/2013	<1.0	<1.0	<9.5	<0.95	<0.95	**38**	<1.9
	10/16/2013	**1.0**	<1.0	<10 UJ	<1.0	<1.0	**18**	<2.0
	4/15/2014	< 1.0	< 1.0	<9.5	<0.95	<0.95	**4.3**	<1.9
	10/22/2014 *	NS	NS	NS	NS	NS	NS	NS
	4/22/2015	< 0.42	< 0.44	NA	NA	**1.3 JB**	**4.9**	NA
	10/20/2015 *	NS	NS	NS	NS	NS	NS	NS
	4/12/2016	NA	NA	NA	NA	NA	**2.6**	NA
	10/27/2016	NA	NA	NA	NA	NA	**3.2**	NA
	4/10/2017	NA	NA	NA	NA	NA	**31**	NA
	10/4/2017	NA	NA	NA	NA	NA	NS	NA
	Cease Monitoring & Gauging KC-11 Per Ecy Approval 11-28-17							
KC-13	10/20/2009 *	NS	NS	NS	NS	NS	NS	NS
	4/23/2010 *	NS	NS	NS	NS	NS	NS	NS
	10/11/2011 *	NS	NS	NS	NS	NS	NS	NS
	4/19/2012 *	NS	NS	NS	NS	NS	NS	NS
	11/7/2012 *	NS	NS	NS	NS	NS	NS	NS
	4/10/2013 *	NS	NS	NS	NS	NS	NS	NS
	10/16/2013 *	NS	NS	NS	NS	NS	NS	NS
	4/15/2014 *	NS	NS	NS	NS	NS	NS	NS
	10/22/2014 *	NS	NS	NS	NS	NS	NS	NS
	4/22/2015	< 0.42	< 0.44	NA	NA	**1.7 JB**	**1.7 J**	NA
	10/20/2015 *	NS	NS	NS	NS	NS	NS	NS
	4/12/2016 *	NS	NS	NS	NS	NS	NS	NS
	Cease Monitoring KC-13, Continue Gauging Per Ecy 11/29/16 Ltr.							
USRW-2	10/25/2007	**2.8**	< 1.0	< 9.9 UJ	< 0.99	< 0.99	**1,500**	**39**
	10/25/2007 Dup	**2.7**	< 1.0	< 9.9 UJ	< 0.99	< 0.99	**1,400**	**40**
	4/17/2008	< 1.0	< 1.0	< 9.7 UJ	< 0.97	< 0.97	< 0.97	< 2
	4/17/2008 Dup	< 1.0	< 1.0	< 9.7 UJ	< 0.97	< 0.97	< 0.97	< 2
	10/28/2008	**1.2**	< 1.0	< 9.5 J	< 0.95	< 0.95	**1,500**	**22**
	10/28/2008 Dup	**1.1**	< 1.0	< 9.5 J	< 0.95	< 0.95	**1,600**	**23**
	4/22/2009	< 1.0	< 1.0	< 9.6 J	< 0.96	< 0.96	**1,000**	**10**
	4/22/2009 Dup	< 1.0	< 1.0	< 9.6 J	< 0.96	< 0.96	**1,100**	**8.4**
	10/20/2009	**1.2**	< 1.0	< 11 J	< 1.1	< 1.1	**800**	**41**
	10/20/2009 Dup	**1.2**	< 1.0	< 10 J	< 1.0	< 1.0	**970**	**43**
	4/22/2010	< 1.0	< 1.0	< 10 J	< 1.0	< 1.0	**850**	**20**
	4/22/2010 Dup	< 1.0	< 1.0	< 9.0 J	< 0.99	< 0.99	**780**	**20**
	10/19/2010	< 1.0	< 1.0	< 9.8	**5**	< 0.98	**880**	**43**
	10/11/2011	< 1.0	< 1.0	<9.5	<0.95	<0.95	**310**	**5.5**
	10/11/2011 Dup	< 1.0	< 1.0	<9.5	<0.95	<0.95	**490**	**6.7**
	4/19/2012	< 1.0	< 1.0	<9.5	<0.95	**<2.4**	**400**	**9.6**
	4/19/2012 Dup	< 1.0	< 1.0	<9.5	<0.95	**<2.4**	**400**	**9.3**
	11/7/2012	< 1.0	< 1.0	<9.5 UJ	<0.95	<0.95	**500**	**11**
	11/7/2012 Dup	< 1.0	< 1.0	<9.5 UJ	<0.95	<0.95	**410**	**9.4**
	4/11/2013	< 1.0	< 1.0	<9.5	<0.95	<0.95	**430**	**7.5**
	10/17/2013	< 1.0	< 1.0	<9.5 UJ	<0.95	<0.95	**380**	**6.3**
	10/17/2013 Dup	< 1.0	< 1.0	<9.5 UJ	<0.95	<0.95	**380**	**8.1**
	4/15/2014	< 1.0	< 1.0	<9.5	<0.95	<0.95	**330**	**6.1**
	4/15/2014 Dup	< 1.0	< 1.0	<9.5	<0.95	<0.95	**340**	**6.4**
	10/23/2014	< 0.060	< 0.11	NA	NA	< 0.27 H	**370 H**	NA
	10/23/2014 Dup	< 0.060	< 0.11	NA	NA	< 0.26 H	**360 H**	NA
	4/22/2015	< 0.42	< 0.44	NA	NA	**1.2 JB**	**270**	NA
	10/20/2015	NA	NA	NA	NA	NA	**430 D**	NA
	4/13/2016	NA	NA	NA	NA	NA	**340 D**	NA
	10/27/2016	NA	NA	NA	NA	NA	**290 D**	NA
	4/11/2017	NA	NA	NA	NA	NA	< 1.0	NA
	10/3/2017	NA	NA	NA	NA	NA	**390 D**	NA
	4/25/2018	NA	NA	NA	NA	NA	**140**	NA
	10/1/2018	NA	NA	NA	NA	NA	**204**	NA
	4/15/2019	NA	NA	NA	NA	NA	< 1.0	NA
	10/15/2019	NA	NA	NA	NA	NA	**178 D**	NA
	4/9/2020	NA	NA	NA	NA	NA	**1.43**	NA
	10/20/2020	NA	NA	NA	NA	NA	**280**	NA
	4/12/2021	NA	NA	NA	NA	NA	<0.478	NA
	10/6/2021	NA	NA	NA	NA	NA	<0.480	NA
	4/19/2022	NA	NA	NA	NA	NA	< 1.0 U	NA

Table 3-2
WIA Upper Sand Analytical Data (10/2007 – 4/2022)
Emerald Kalama Chemical, Kalama, WA

Well	Date	VOCs (µg/L) (EPA Method 8021B / 8260)		SVOCs (µg/L) (EPA Method 8270C SIM)				
		Benzene	Toluene	Benzoic Acid	Biphenyl	Bis (2-ethylhexyl) phthalate	Diphenyl Oxide	Phenol
	Cleanup Level	**1.2**	**2,000**	**24,590**	**230**	**1.8**	**410**	**2,560**
North Sump	7/25/2007	< 1 U	< 1 U	< 9.5 U	< 0.95 U	< 0.95 U	**550 D**	**38**
	10/23/2007	< 1.0	< 1.0	< 9.0 UJ	< 0.95	< 0.95	**600**	**13**
	1/17/2008	< 1 U	< 1 U	< 11 U	< 1.1 U	< 1.1 U	**330 D**	**8.4**
	4/15/2008	< 1.0	< 1.0	< 9.5 UJ	< 0.95	< 0.95	**490**	**5.2**
	7/28/2008	< 1.0	< 1.0	< 9.5	< 0.95	< 0.95	**950**	**19**
	10/24/2008	**140**	**1,500**	**27 J**	**120**	< 0.95	**1,100**	**16**
	11/3/2008	< 1.0	< 1.0	< 10 J	< 1	< 1	**140**	**38**
	1/30/2009	< 1.0	< 1.0	< 9.8	< 0.98	< 0.98	**710**	**24**
	4/22/2009	< 1.0	< 1.0	< 11 J	< 1.1	**3.7**	**570**	**15**
	10/21/2009 *	NS	NS	NS	NS	NS	NS	NS
	4/21/2010	< 1.0	< 1.0	< 9.0 J	< 0.97	< 0.97	**290**	**15**
	10/19/2010	< 1.0	< 1.0	< 9.6	< 0.96	< 0.96	**390**	**9.3**
	10/11/2011	<1.0	< 1.0	<9.7	<0.97	<0.97	**470**	**8.5**
	4/19/2012	<1.0	< 1.0	<9.5	<0.95	**<2.4**	**320**	**6.2**
	11/7/2012	<1.0	< 1.0	<9.5 UJ	<0.95	<0.95	**380**	**11**
	4/10/2013	<1.0	<1.0	<9.5	<0.95	<0.95	**310**	**5.2**
	10/16/2013	<1.0	<1.0	<9.5 UJ	<0.95	<0.95	**460**	**7.7**
	4/14/2014	< 1.0	< 1.0	<9.7	<0.97	<0.97	**340**	**8.7**
	10/21/2014	< 0.060	< 0.11	NA	NA	< 0.30	**210**	NA
	4/20/2015	< 0.42	< 0.44	NA	NA	**1.1 JB**	**370**	NA
	10/19/2015	NA	NA	NA	NA	NA	**180**	NA
	4/12/2016	NA	NA	NA	NA	NA	**140**	NA
	10/24/2016	NA	NA	NA	NA	NA	**99**	NA
	4/10/2017	NA	NA	NA	NA	NA	**130**	NA
	10/4/2017	NA	NA	NA	NA	NA	**190**	NA
	4/23/2018	NA	NA	NA	NA	NA	**190**	NA
	10/2/2018	NA	NA	NA	NA	NA	**268**	NA
		Ceased Sump Pumping & Sampling, Maintain Functionality - Ecy Approval 11-14-18						
South Sump	7/25/2007	**2.2**	**1.9**	< 9.6 U	<0.96 U	<0.96 U	**73 D**	**28**
	10/23/2007	< 1.0	**2.5**	< 9.0 UJ	<0.97	<0.97	**1.5 J**	< 2.0
	1/17/2008	< 1 U	< 1 U	< 9.5 U	<0.95 U	<0.95 U	< 0.95	< 1.9 U
	4/15/2008	< 1.0	**1.7**	< 9.6 UJ	<0.96	<0.96	**140**	**12**
	7/28/2008	**10**	**3**	< 9.6	<0.96	<0.96	**370**	**5.5**
	1/30/2009	< 1.0	**700**	< 9.9	<0.99	<0.99	**380**	**7.9**
	4/22/2009	< 1.0	**4.8**	< 9.6 J	<0.96	<0.96	**620**	**6.4**
	10/21/2009 *	NS	NS	NS	NS	NS	NS	NS
	4/21/2010	< 1.0	< 1.0	< 9.0 J	< 0.97	<0.97	**130 J**	**13 J**
	10/19/2010	< 1.0	< 1.0	< 9.6	<0.96	<0.96	**38**	**9.7**
	10/11/2011	<1.0	<1.0	<9.5	<0.95	<0.95	**550**	**11**
	4/19/2012	<1.0	**3.4**	<9.7	<0.97	<0.97	**110**	**2.8**
	11/7/2012	<1.0	< 1.0	<9.5 UJ	<0.95	<0.95	**130**	**2.2**
	4/10/2013	<1.0	<1.0	**11**	<0.95	<0.95	**76**	**6.7 J**
	10/16/2013	<1.0	<1.0	<9.5 UJ	<0.95	<0.95	**230**	**5.2**
	4/14/2014	<1.0	<1.0	<9.5	<0.95	<0.95	**130**	**3.3**
	10/21/2014	< 0.060	< 0.11	NA	NA	< 0.26	**200**	NA
	4/20/2015	< 0.42	< 0.44	NA	NA	**1.1 JB**	**160**	NA
	10/19/2015	NA	NA	NA	NA	NA	**320**	NA
	4/12/2016	NA	NA	NA	NA	NA	**1.6**	NA
	10/24/2016	NA	NA	NA	NA	NA	< 0.95	NA
	4/10/2017	NA	NA	NA	NA	NA	< 0.96	NA
	10/4/2017	NA	NA	NA	NA	NA	**65**	NA
	4/23/2018	NA	NA	NA	NA	NA	**71**	NA
	10/2/2018	NA	NA	NA	NA	NA	**63**	NA
		Ceased Sump Pumping & Sampling, Maintain Functionality - Ecy Approval 11-14-18						

Notes:
< - Constituent Non-detect
Bold indicates detection.
Dup - Field Duplicate Sample.
NA - Not analyzed, Ecy Apprvl.
J - Estimated concentration.
H - Sample prep or analyzed beyond specified holding time
Bold and shaded Detection above cleanup level.
* NS - Not sampled due to lack of water.
EPA = U.S. Environmental Protection Agency; µg/L = micrograms per liter; SVOC = semivolatile organic compound; WIA = West Impacted Area

Table 4-1
WIA Intermediate Sand Aquifer Groundwater Monitoring Program 2021 - 2022
Emerald Kalama Chemical, Kalama, WA

Well Location	Sampling Frequency	Field Parameters	Analytical Parameters	Gauging Frequency
KC-6, PZ-117, PZ-118, Columbia River	—	—	—	Quarterly (Per EKC Temporary Request)
ISRW-1, ISRW-2B, ISRW-3, ISRW-4, ISRW-5, ISRW-6, ISRW-7, ISRW-8, ISRW-9, ISRW-10	Quarterly (Per EKC Temporary Request)	—	Benzene, Toluene (8021)	
KC-14, MW-239, MW-243, MW-250	Semi-Annual	Temperature, pH, ORP, conductivity, turbidity, DO	Benzene, Toluene (8260)	

Notes:
DO = dissolved oxygen; ORP = oxidation reduction potential; WIA = West Impacted Area

Table 4-2
WIA Intrmdiate Sand Aquifer Anlyticl Data (10/2007 - 4/2022)
Emerald Kalama Chemical, Kalama, WA

Well	Date		VOCs (µg/L) (EPA Method 8021B/8260)			
			Benzene		Toluene	
	Cleanup Level		1.2		2,000	
ISRW-1	7/25/2007		290	D	35,000	D
	7/25/2007	Dup	310	D	34,000	D
	10/23/2007		380		61,000	
	10/23/2007	Dup	370		59,000	
	1/17/2008		390	D	65,000	D
	1/17/2008	Dup	390	D	69,000	D
	4/15/2008		350		55,000	
	4/15/2008	Dup	360		54,000	
	7/28/2008		550		56,000	
	7/28/2008	Dup	570		63,000	
	10/23/2008		250		27,000	
	10/23/2008	Dup	240		29,000	
	1/30/2009		360		35,000	
	1/30/2009	Dup	340		35,000	
	4/20/2009		100		26,000	J
	4/20/2009	Dup	110		45,000	J
	10/21/2009		400		58,000	
	10/21/2009	Dup	410		58,000	
	4/21/2010		430		47,000	
	4/21/2010	Dup	440		49,000	
	10/19/2010		190		23,000	
	10/11/2011		250		49,000	
	10/11/2011	Dup	260		49,000	
	4/19/2012		200		36,000	
	4/19/2012	Dup	200		35,000	
	11/6/2012		153		40,600	
	11/6/2012	Dup	170		45,700	
	4/9/2013		230		66,000	
	4/9/2013	Dup	230		66,000	
	10/16/2013		160		49,000	
	10/16/2013	Dup	150		47,000	
	4/14/2014		240		55,000	
	4/14/2014	Dup	240		55,000	
	10/21/2014		< 600		68,000	
	4/20/2015		170		46,000	
	10/19/2015		110	D	33,000	D
	4/11/2016		200	D	61,000	D
	10/24/2016		120	D	48,000	D
	4/10/2017		240	D	63,000	D
	10/4/2017		160	D	48,000	D
	4/23/2018	all on	200	D	72,000	D
	4/26/2018	5-10off	270	D	110,000	D
	5/16/2018	HiRVR	280	D	110,000	D
	8/6/2018	Smr1/4	107		35,800	D
	10/2/2018		99	D	43,100	D
	1/16/2019		87		51,800	D
	4/12/2019		166		92,500	
	7/30/2019		45.0		12,300	D
	10/15/2019		30.3		11,100	D
	1/7/2020		91.2		45,800	D
	4/7/2020 VOA#1(4/15)		37.3		4,140	D
	4/7/2020 VOA#3(4/24)		NA		21,100	H
	7/28/2020		89.8		19,700	D
	10/19/2020		39.0		16,100	D
	10/19/2020	Dup	36.0		11,400	D
	1/15/2021		68.6		51,400	D
	1/15/2021	Dup	86.6		50,600	D
	4/8/2021		23.8	D	13,600	D
	7/16/2021(ALS 8260)		34		26,000	
	7/16/2021(Spclty 8021)		34.2	D	21,900	D
	10/1/2021(Spclty 8260)		<300	DQ	1,720	D
	10/1/2021 Dup Spclty		6.8	D	1,870	D
	1/18/2022	(ALS)	<50	U,D	30,000	D
	1/18/2022 Dup ALS (11)		<50	U,D	32,000	D
	4/14/2022		<25	U,D	11,000	D

Table 4-2
WIA Intrmdiate Sand Aquifer Anlyticl Data (10/2007 - 4/2022)
Emerald Kalama Chemical, Kalama, WA

Well	Date		VOCs (µg/L) (EPA Method 8021B/8260)			
			Benzene		Toluene	
	Cleanup Level		1.2		2,000	
ISRW-2B	7/25/2007		14	D	8,500	D
	10/23/2007		7.6		3,000	
	1/17/2008		45	D	22,000	D
	4/15/2008		60		20,000	
	7/28/2008		150		36,000	
	10/23/2008		130		31,000	
	1/30/2009		77		33,000	
	4/20/2009		230		150,000	
	10/21/2009		330		260,000	
	4/21/2010		470		720,000	
	10/11/2011		95		83,000	
	4/19/2012		300		23,000	
	11/6/2012		71		53,900	
	4/9/2013		130		61,000	
	10/16/2013		97		68,000	
	4/14/2014		94		72,000	
	10/21/2014		< 600		75,000	
	4/20/2015		94	J	72,000	
	10/19/2015		47	D	18,000	D
	4/11/2016		160	D	110,000	D
	10/24/2016		< 20		11,000	D
	4/10/2017		110	D	92,000	D
	10/4/2017		130	D	74,000	D
	4/23/2018	all on	54	D	9,800	D
	4/26/2018	5-10off	130	D	89,000	D
	8/6/2018	Smr1/4	58		23,600	D
	10/2/2018		59	D	43,200	D
	1/16/2019		96		77,200	D
	4/12/2019		75		52,900	
	7/30/2019		42.6		16,600	D
	10/15/2019		62.8		18,500	D
	1/7/2020		56.1		32,500	D
	4/7/2020 VOA#1(4/15)		100		5,760	D
	4/7/2020 VOA#3(4/24)		NA		50,700	H
	7/28/2020		53.3		18,400	D
	10/19/2020		33.1		8,090	D
	1/15/2021		45.9		54,200	D
	4/8/2021		57.6		20,200	D
	7/16/2021		68.4	D	32,500	D
	10/1/2021	Spclty	96.0	D	17,000	D
	1/18/2022	ALS	69	D	37,000	D
	4/14/2022	ALS	27	D	8,600	D
ISRW-3	7/25/2007		150	D	110,000	D
	10/23/2007		110		82,000	
	1/17/2008		210	D	130,000	D
	4/15/2008		150		100,000	
	7/28/2008		150		110,000	
	10/23/2008		< 500		140,000	
	1/30/2009		98		97,000	
	4/20/2009		13		14,000	
	10/21/2009		9.4		25,000	J
	4/21/2010		17,000		980,000	
	10/19/2010		13		34,000	
	10/11/2011		20		47,000	
	4/19/2012		70		65,000	
	11/6/2012		25		45,000	
	4/9/2013		50		58,000	
	10/16/2013		16		22,000	
	4/14/2014		23		33,000	
	10/21/2014		< 600		47,000	
	4/20/2015		56	J	51,000	
	10/19/2015		55	D	71,000	D
	4/11/2016		120	D	150,000	D
	10/24/2016		290	D	200,000	D
	4/10/2017		< 50	U	74,000	D
	10/4/2017		140	D	100,000	D
	4/23/2018	all on	< 50	U	19,000	D
	4/26/2018	5-10off	< 100	U	67,000	D
	8/6/2018	Smr1/4	54		23,700	D
	10/2/2018		54	D	30,800	D
	1/16/2019		129		93,000	D
	4/12/2019		337		172,000	
	7/30/2019		97.4		63,400	D
	10/15/2019		80.4		51,900	D

Table 4-2
WIA Intrmdiate Sand Aquifer Anlyticl Data (10/2007 - 4/2022)
Emerald Kalama Chemical, Kalama, WA

Well	Date		VOCs (µg/L) (EPA Method 8021B/8260)			
			Benzene		Toluene	
	Cleanup Level		1.2		2,000	
ISRW-3	1/7/2020		204	D	142,000	D
	4/7/2020 VOA#1(4/15)		117		17,200	D
	4/7/2020 VOA#3(4/24)		NA		81,400	H
	7/28/2020		157		44,300	D
	10/19/2020		92.4		56,400	D
	1/15/2021		206	D	204,000	D
	4/8/2021		92.5	D	61,400	D
	4/8/2021	Dup	106	D	72,500	D
	7/16/2021		243	D	133,000	D
	10/1/2021		58.0	D	17,800	D
	1/18/2022	(ALS)	150	D	100,000	D
	4/14/2022	ALS	120	D	73,000	D
ISRW-4	7/25/2007		35	D	20,000	D
	10/23/2007		350		65,000	
	1/17/2008		130	D	34,000	D
	4/15/2008		430		77,000	
	7/28/2008		48		24,000	
	10/23/2008		130		55,000	
	1/30/2009		120		59,000	
	4/20/2009		28		10,000	
	10/21/2009		3.1		4,700	
	4/21/2010		3.7		7,300	
	10/19/2010		7.8		3,200	
	10/11/2011		20		14,000	
	4/19/2012		< 1.0		650	
	11/6/2012		< 0.5		29	
	4/9/2013		0.57		200	
	10/16/2013		< 1.0		59	
	4/14/2014		< 1.0		35	
	10/21/2014		< 600		32,000	
	4/20/2015		15		6,400	
	10/19/2015		8.8	D	29,000	D
	4/11/2016		2.1		1,000	D
	10/24/2016		14		3,100	D
	4/10/2017		< 0.50	U	< 1.0	U
	10/4/2017		< 50	U	9,000	D
	4/23/2018	all on	< 25	U	18,000	D
	4/26/2018	5-10off	< 50	U	15,000	D
	8/6/2018	Smr1/4	6		526	D
	10/2/2018		34	D	6,280	D
	1/16/2019		167	D	34,600	D
	4/12/2019		140		27,800	
	7/30/2019		62.2	D	1,440	D
	10/15/2019		41.2		261	
	1/7/2020		94.5	D	10,000	D
	4/7/2020 VOA#1(4/15)		30.6		2,200	D
	4/7/2020 VOA#3(4/24)		NA		5,640	H
	7/28/2020		6.03		1,250	D
	10/19/2020		96.9		25,100	D
	1/15/2021		0.918		40	
	4/8/2021		6.76	D	296	D
	7/16/2021		25.8	D	6,080	D
	10/1/2021		7.30		78.8	
	1/18/2022	(ALS)	10	D	3,800	D
	4/14/2022	ALS	11	D	690	D
ISRW-5	7/25/2007		110	D	37,000	D
	10/23/2007		110		45,000	
	1/17/2008		170	D	62,000	D
	4/15/2008		140		68,000	
	7/28/2008		360		110,000	
	10/23/2008		130		47,000	
	1/30/2009		100		33,000	
	4/22/2009		79		52,000	
	10/21/2009		40		20,000	
	4/21/2010		7.5		2,400	
	10/19/2010		26		7,900	
	10/11/2011		36		15,000	
	4/19/2012		30		12,000	
	11/6/2012		402		48,500	
	4/9/2013		94		46,000	
	10/16/2013		160		92,000	
	4/14/2014		37		16,000	
	10/21/2014		< 600		19,000	
	4/20/2015		76	J	25,000	
	10/19/2015		84	D	17,000	D
	4/11/2016		< 100		31,000	D
	10/24/2016		120	D	130,000	D
	4/10/2017		50	D	46,000	D

Table 4-2
WIA Intrmdiate Sand Aquifer Anlyticl Data (10/2007 - 4/2022)
Emerald Kalama Chemical, Kalama, WA

Well	Date	VOCs (µg/L) (EPA Method 8021B/8260)			
		Benzene		Toluene	
	Cleanup Level	1.2		2,000	
ISRW-5	10/4/2017	80	D	53,000	D
	4/23/2018	190	D	110,000	D
	8/6/2018 Smr1/4	88		59,700	D
	10/2/2018	72	D	106,000	D
	1/16/2019	79		60,300	D
	4/12/2019	106		90,200	
	7/30/2019	72.5		56,000	D
	10/15/2019	20.9		15,900	D
	1/7/2020	58.6		71,900	D
	4/7/2020 VOA#1(4/15)	42.2		11,000	D
	4/7/2020 VOA#3(4/24)	NA		93,800	H
	5/12/20 VOA#1	66.9		74,700	D
	5/12/20 VOA #3	68.4		74,300	D
	7/28/2020	110		45,400	D
	10/19/2020	47.2		28,900	D
	1/15/2021	256	D	158,000	D
	4/8/2021	25.4	D	46,400	D
	7/16/21 ALS 8260	31		38,000	
	7/16/21 Spclty 8021	27.6	D	36,300	D
	10/1/2021 Spclty 8260	<30.0	D	21,300	D
	1/18/2022 ALS	<100	U,D	78,000	D
	4/14/2022 ALS	<100	U,D	34,000	D
ISRW-6	7/25/2007	150	D	59,000	D
	10/23/2007	120		47,000	
	1/17/2008	150	D	58,000	D
	4/15/2008	190		69,000	
	7/28/2008	140		53,000	
	10/23/2008	< 200		62,000	
	1/30/2009	140		61,000	
	4/20/2009	15		16,000	
	10/21/2009	1.4		270	
	4/21/2010	56		22,000	
	10/19/2010	49		42,000	
	10/11/2011	4.3		1,000	
	4/19/2012	18		14,000	
	11/7/2012	2.0		1,420	
	4/9/2013	8.6		6,900	
	10/16/2013	1.1		1,200	
	4/14/2014	6.1		8,100	
	10/21/2014	1.3	J	890	
	4/20/2015	0.73	J	790	
	10/19/2015	1.7		270	D
	4/11/2016	3.7	D	2,300	D
	10/24/2016	140	D	57,000	D
	4/12/2017	< 0.50	U	< 1.0	U
	10/4/2017	< 50	U	10,000	D
	4/23/2018	1.8		1,400	D
	5/16/2018 HiRvr	1.1		1,400	D
	8/6/2018 Smr1/4	0.6		377	D
	10/2/2018	2.7		2,220	D
	1/16/2019	34	D	10,100	D
	4/12/2019	32.6		5,940	
	7/30/2019	45.4		2,470	D
	10/15/2019	33.2		1,860	D
	1/7/2020	7.90	D	341	D
	4/7/2020 VOA#1(4/15)	1.35		120	D
	4/7/2020 VOA#3(4/24)	NA		630	H
	7/28/2020	0.750		1,340	D
	10/19/2020	0.710		365	D
	1/15/2021	< 3.00	D	3,120	D
	4/8/2021	3.94	D	2,990	D
	7/16/2021	57.5	D	16,900	D
	10/1/2021	54.0	D	7,520	D
	1/18/2022 ALS	46	D	18,000	D
	4/14/2022 ALS	140	D	31,000	D
ISRW-7	7/25/2007	1,100		24,000	D
	10/23/2007	350		9,400	
	1/17/2008	540	D	19,000	D
	4/15/2008	200		11,000	
	7/28/2008	520		32,000	
	10/23/2008	280		14,000	
	1/30/2009	120		9,100	
	4/20/2009	83		5,900	
	10/21/2009	3,400		45,000	
	4/21/2010	2,700		30,000	
	10/19/2010	17,000		18,000	
	10/11/2011	4,000		27,000	

Table 4-2
WIA Intrmdiate Sand Aquifer Anlyticl Data (10/2007 - 4/2022)
Emerald Kalama Chemical, Kalama, WA

Well	Date		VOCs (µg/L) (EPA Method 8021B/8260)			
			Benzene		Toluene	
	Cleanup Level		1.2		2,000	
ISRW-7	4/19/2012		1,100		18,000	
	11/6/2012		1,220		18,700	
	4/9/2013		180		9,900	
	10/16/2013		380		6,600	
	4/14/2014		900		14,000	
	10/21/2014		530		1,800	
	4/20/2015		12		2,100	
	10/19/2015		170	D	1,700	D
	4/11/2016		54	D	4,300	D
	10/24/2016		92	D	1,600	D
	4/10/2017		190	D	10,000	D
	10/4/2017		180	D	2,800	D
	4/23/2018		72	D	330	D
	5/16/2018	HiRvr	270	D	1,700	D
	8/6/2018	Smr1/4	8		46	
	10/2/2018		1.1		< 1.0	
	1/16/2019		0.6		< 1.00	
	4/12/2019		< 0.300		< 1.00	
	7/30/2019		0.500		3.24	
	10/15/2019		< 0.300		19.7	
	1/7/2020		7.27		730	D
	4/7/2020 VOA#1(4/15)		4.51		124	D
	4/7/2020 VOA#3(4/24)		NA		372	H
	7/28/2020		0.32		123	D
	10/19/2020		< 0.300		28.7	
	1/15/2021		< 0.300		0.515	
	4/8/2021		< 0.300		< 0.500	
	7/16/2021		< 0.300		1.31	
	10/1/2021		< 0.300		< 1.00	
	1/18/2022	ALS	< 0.50		0.66	
	4/14/2022	ALS	< 0.50		< 0.50	
ISRW-8	4/20/2009		90		66,000	
	10/21/2009		45		50,000	
	4/21/2010		71		57,000	
	10/19/2010		31		72,000	
	10/11/2011		52		54,000	
	4/19/2012		53		40,000	
	11/6/2012		69		51,200	
	4/9/2013		58		33,000	
	10/16/2013		64		39,000	
	4/14/2014		61		40,000	
	10/21/2014		< 600		36,000	
	4/20/2015		84	J	51,000	
	10/19/2015		58	D	39,000	D
	4/11/2016		< 100		79,000	D
	10/24/2016		140	D	74,000	D
	4/10/2017		17	D	20,000	D
	10/4/2017		140	D	84,000	D
	4/23/2018		< 100	U	44,000	D
	4/26/2018	5-10off	< 100	U	69,000	D
	8/6/2018	Smr1/4	127		49,500	D
	10/2/2018		170		61,800	D
	1/16/2019		148		67,400	D
	4/12/2019		164		107,000	
	7/30/2019		102		49,100	D
	10/15/2019		130		34,800	
	1/7/2020		107		69,700	D
	4/7/2020 VOA#1(4/15)		115		7,240	D
	4/7/2020 VOA#3(4/24)		NA		62,700	H
	7/28/2020		111		33,200	D
	10/19/2020		115		31,700	D
	1/15/2021		81.6		43,400	D
	4/8/2021		64.0	D	45,800	D
	7/16/2021 ALS 8260		70		52,000	
	7/16/21 Spclty 8021		71.8	D	44,000	D
	10/1/2021		60.0	D	17,000	D
	1/18/2022	ALS	77	D	45,000	D
	4/14/2022	ALS	56	D	39,000	D
ISRW-9	4/20/2009		120		62,000	
	10/21/2009		71		36,000	
	4/21/2010		81		42,000	
	10/19/2010		71		55,000	
	10/11/2011		4.1		920	
	4/19/2012		22		16,000	
	11/6/2012		40		20,100	
	4/9/2013		47		35,000	
	10/16/2013		83		73,000	

Table 4-2
WIA Intrmdiate Sand Aquifer Anlyticl Data (10/2007 - 4/2022)
Emerald Kalama Chemical, Kalama, WA

Well	Date	VOCs (µg/L) (EPA Method 8021B/8260)			
		Benzene		Toluene	
	Cleanup Level	1.2		2,000	
ISRW-9	4/14/2014	39		35,000	
	10/21/2014	< 600		30,000	
	4/20/2015	79	J	64,000	
	10/19/2015	55	D	44,000	D
	4/11/2016	< 100		53,000	D
	10/24/2016	77	D	95,000	D
	4/10/2017	19	D	19,000	D
	10/4/2017	< 50	U	22,000	D
	4/23/2018	< 100	U	83,000	D
	5/16/2018 HiRvr	< 200	U	59,000	D
	8/6/2018 Smr1/4	27		11,500	D
	10/2/2018	36		12,600	D
	1/16/2019	28		25,300	D
	4/12/2019	81.3		77,900	
	7/30/2019	20.3		8,570	D
	10/15/2019	58.5		45,800	D
	1/7/2020	64.4		71,700	D
	4/7/2020 VOA#1(4/15)	45.7		3,440	D
	4/7/2020 VOA#3(4/24)	NA		33,300	H
	7/28/2020	31.2		18,600	D
	10/19/2020	26.3		14,200	D
	1/15/2021	42.0		48,800	D
	4/8/2021	60.8	D	40,900	D
	7/16/2021	9.98	D	7,430	D
	10/1/2021 Spclty	< 15.0	D	4,360	D
	1/18/2022 ALS	< 25	U,D	17,000	D
	4/14/2022 ALS	36	D	8,700	D
ISRW-10	4/20/2009	180		38,000	
	10/21/2009	3.8		1,400	
	4/21/2010	2		380	
	10/19/2010	< 1.0		63	
	10/11/2011	16		1,100	
	4/19/2012	85		15,000	
	11/6/2012	< 1.0		2.5	
	4/9/2013	34		3,300	
	10/16/2013	96		8,300	
	4/14/2014	< 1.0		7.7	
	10/21/2014	3.9		140	
	4/20/2015	< 0.42		13	
	10/19/2015	52	D	3,800	D
	4/11/2016	49	D	4,700	D
	10/24/2016	190	D	29,000	D
	4/10/2017	29		4,300	D
	10/4/2017	110	D	43,000	D
	4/23/2018	220	D	30,000	D
	8/6/2018	36		2,900	D
	10/2/2018	151		18,800	D
	1/16/2019	204	D	78,300	D
	4/12/2019	385		113,000	
	7/30/2019	160	D	43,900	D
	10/15/2019	82.9		22,600	D
	1/7/2020	243	D	80,200	D
	4/7/2020 VOA#1(4/15)	72.5		4,300	D
	4/7/2020 VOA#3(4/24)	NA		29,300	H
	7/28/2020	319		34,900	D
	10/19/2020	135	D	328,000	D
	1/15/2021	145		50,200	D
	4/8/2021	53.8	D	20,600	D
	7/16/2021 ALS 8260	150		74,000	
	7/16/2021 Spclty 8021	148	D	61,600	D
	10/1/2021	127	D	35,900	D
	1/18/2022 ALS	110	D	47,000	D
	4/14/2022 ALS	63	D	45,000	D
KC-14	10/24/2007	2.9		940	
	4/16/2008	< 1.0		180	
	10/27/2008	3.1		1,100	
	4/22/2009	< 1.0		99	
	10/20/2009	1.3		1,300	
	4/23/2010	0.92		690	
	10/19/2010	14		270,000	
	10/10/2011	< 1.0		420	
	4/18/2012	1.4	J	140	J
	11/7/2012	< 1.0		< 1.0	
	4/10/2013	< 0.5		200	
	10/17/2013	4.2		88	
	4/16/2014	< 1.0		30	
	10/22/2014	< 0.060		< 0.11	
	4/22/2015	< 0.42		< 0.44	

Table 4-2
WIA Intrmdiate Sand Aquifer Anlyticl Data (10/2007 - 4/2022)
Emerald Kalama Chemical, Kalama, WA

Well	Date		VOCs (µg/L) (EPA Method 8021B/8260)					
			Benzene			Toluene		
	Cleanup Level		**1.2**			**2,000**		
KC-14	4/22/2015	Dup	< 0.42			< 0.44		
	10/20/2015		< 1.0			**66**	D	
	4/12/2016		< 1.0			**20**		
	10/24/2016		< 1.0			**1.9**		
	4/12/2017		**2.5**			**160**	D	
	10/4/2017		< 0.50			< 1.0		
	4/25/2018		< 1.0			**20**		
	10/1/2018		NS			NS		
	4/15/2019		**0.420**			**7.15**		
	10/15/2019		< 0.300			**1.14**		
	4/9/2020		< 0.300			**9.52**		
	10/21/2020		< 0.300			< 1.00		
	4/13/2021		< 0.300			< 1.00		
	10/6/2021		< 0.300			< 1.00		
	4/19/2022		**2.8**			15		
MW-239	10/24/2007		**660**			**120,000**		
	4/16/2008		**1200**			**190,000**		
	10/27/2008		**580**			**100,000**		
	4/22/2009		< 1.0			< 1.0		
	10/20/2009		< 1.0			**1.4**		
	4/23/2010		**9.3**			**3,500**		
	10/19/2010		**7.7**			**260**		
	10/11/2011		**310**			**55,000**		
	4/18/2012		< 1.0			< 1.0		
	11/7/2012		**413**			**35,300**	**D**	
	4/10/2013		**71**			**390**		
	10/17/2013		**180**			**15,000**	**D**	
	4/16/2014		< 1.0			< 1.0		
	10/23/2014		**5.2**			**0.62**		
	4/23/2015		**80**	**J**		**8,400**	**D**	
	10/20/2015		**280**	**D**		**8,200**	**D**	
	10/20/2015	Dup	**290**	**D**		**8,500**	**D**	
	4/12/2016		**90**	**D**		**810**	D	
	4/12/2016	Dup	**87**	**D**		**1,000**	D	
	10/24/2016		**340**	**D**		**43,000**	**D**	
	10/24/2016	Dup	**360**	**D**		**43,000**	**D**	
	4/11/2017		< 0.50	U		< 1.0	U	
	4/11/2017	Dup MW	< 0.50	U		< 1.0	U	
	10/3/2017		**580**	**D**		**140,000**	**D**	
	4/25/2018		**130**	**D**		**3,100**	**D**	
	4/25/2018	Dup MW9	**140**	**D**		**3,200**	**D**	
	10/3/2018		**320**	**D**		**32,700**	**D**	
	10/3/2018	Dup 97	**370**	**D**		**40,200**	**D**	
	4/15/2019		**454**	**D**		**39,700**	**D**	
	4/15/2019	Dup 97	**450**	**D**		**39,100**	**D**	
	10/15/2019		**178**			**15,700**	**D**	
	10/15/2019	Dup 97	**175**			**15,400**	**D**	
	4/9/2020		**160**			**11,200**	**D**	
	4/9/2020	Dup 97	**< 0.300**			**24.4**		
	10/21/2020		**341**	**D**		**17,300**	**D**	
	10/21/2020	Dup 97	**407**	**D**		**17,600**	**D**	
	4/13/2021		**426**	**D**		**32,300**	**D**	
	10/6/2021		**< 60.0**	**DQ**		**1,470**	**D**	
	10/6/2021	Dup97	**54.0**	**D**		**1,900**	**D**	
	4/19/2022		**91**	**D**		**2,200**	**D**	
	4/19/2022	Dup97	**87**	**D**		**2,100**	**D**	
MW-243	10/24/2007		< 1.0			< 1.0		
	4/17/2008		< 1.0			< 1.0		
	10/27/2008		< 1.0			< 1.0		
	4/22/2009		< 1.0			< 1.0		
	10/20/2009		< 1.0			< 1.0		
	4/22/2010		< 1.0			< 1.0		
	10/19/2010		< 1.0			< 1.0		
	10/11/2011		< 1.0			< 1.0		
	4/18/2012		< 1.0			< 1.0		
	11/7/2012		< 1.0			< 1.0		
	4/10/2013		< 1.0			< 1.0		
	10/17/2013		< 1.0			< 1.0		
	4/15/2014		< 1.0			< 1.0		
	10/22/2014		< 0.06			< 0.11		
	4/21/2015		< 0.42			< 0.44		
	10/20/2015		< 1.0			< 1.0		
	4/13/2016		< 1.0			< 1.0		
	10/24/2016		< 1.0			< 1.0		
	4/12/2017		< 0.50			< 1.0		
	10/4/2017		< 0.50			< 1.0		
	4/24/2018		< 1.0			< 1.0		
	10/1/2018		< 0.30			< 1.0		

Table 4-2
WIA Intrmdiate Sand Aquifer Anlyticl Data (10/2007 - 4/2022)
Emerald Kalama Chemical, Kalama, WA

Well	Date	VOCs (µg/L) (EPA Method 8021B/8260)	
		Benzene	Toluene
	Cleanup Level	1.2	2,000
MW-243	4/15/2019	< 0.30	< 1.00
	10/15/2019	< 0.300	< 1.00
	4/9/2020	< 0.300	< 1.00
	10/21/2020	< 0.300	< 1.00
	4/13/2021	< 0.300	7.98
	10/6/2021	< 0.300 U	< 1.00 U
	4/19/2022	< 0.50 U	< 0.50 U
MW-249	10/24/2007	< 1.0	< 1.0
	4/16/2008	< 1.0	< 1.0
	10/27/2008	< 1.0	< 1.0
	4/22/2009	< 1.0	< 1.0
	10/20/2009	< 1.0	< 1.0
	4/23/2010	< 1.0	< 1.0
	10/20/2010	< 1.0	< 1.0
	10/10/2011	< 1.0	< 1.0
	4/18/2012	< 1.0	< 1.0
	11/7/2012	< 1.0	< 1.0
	4/10/2013	< 1.0	< 1.0
	10/17/2013	< 1.0	< 1.0
	4/15/2014	< 1.0	< 1.0
	10/22/2014	< 0.060	< 1.0
	4/23/2015	< 0.42	< 1.0
	10/20/2015	< 1.0	< 1.0
	4/12/2016	< 1.0	< 1.0
	MW-249 Monitoring Ceased Per 112916 Ecy Ltr.		
MW-250	10/25/2007	< 1.0	< 1.0
	4/17/2008	< 1.0	< 1.0
	4/17/2008 Dup	< 1.0	< 1.0
	10/27/2008	< 1.0	**3**
	10/27/2008 Dup	< 1.0	**3**
	4/23/2009	< 1.0	< 1.0
	4/23/2009 Dup	< 1.0	< 1.0
	10/20/2009 Dup	< 1.0	< 1.0
	10/20/2009	< 1.0	< 1.0
	4/23/2010 Dup	< 1.0	< 1.0
	4/23/2010	< 1.0	< 1.0
	10/19/2010	< 1.0	< 1.0
	10/11/2011	< 1.0	< 1.0
	10/11/2011 Dup	< 1.0	< 1.0
	4/18/2012	< 1.0	< 1.0
	11/7/2012	< 1.0	< 1.0
	4/10/2013	< 1.0	< 1.0
	4/10/2013 Dup	< 1.0	< 1.0
	10/17/2013	< 1.0	< 1.0
	10/17/2013 Dup	< 1.0	< 1.0
	4/15/2014	< 1.0	< 1.0
	4/15/2014 Dup	< 1.0	< 1.0
	10/22/2014	< 0.060	< 0.1
	10/22/2014 Dup	< 0.060	< 0.1
	4/23/2015	< 0.42	< 0.4
	4/23/2015 Dup	< 0.42	< 0.4
	10/20/2015	< 1.0	< 1.0
	4/12/2016	**< 73 D**	< 1.0
	10/24/2016	< 1.0	< 1.0
	4/12/2017	< 0.50	< 1.0
	10/4/2017	< 0.50	< 1.0
	4/25/2018	< 1.0	< 1.0
	10/3/2018	< 0.30	**13.8**
	4/15/2019	< 0.30	**3.47**
	10/16/2019	< 0.30	< 1.0
	4/9/2020	< 0.300	**13.8**
	10/21/2020	< 0.300	< 1.00
	4/13/2021	< 0.300	< 1.00
	10/6/2021	< 0.300	< 1.00
	4/19/2022	< 0.50	< 0.50

Notes:
(1) - ISRW pump wells sampled by peristaltic pump October 2015 & April 2016
< - Result is non-detected above the laboratory reporting limit.
< - Detection limit above cleanup level.
Bold indicates detection.
Dup - Field Duplicate Sample.
D - Laboratory analtyical dilution
J - Estimated concentration.
Bold and shaded Detection above cleanup level.
EPA = U.S. Environmental Protection Agency; µg/L micrograms per liter;
VOC = volatile organic compound; WIA = West Impacted Area

Table 4-3
WIA ISRW Groundwater Extraction Pump Volume Data (2021 - 2022)
Emerald Kalama Chemical, Kalama, WA

Date	Groundwater Extracted (gallons)										
	ISRW-1	ISRW-2	ISRW-3	ISRW-4	ISRW-5	ISRW-6	ISRW-7	ISRW-8	ISRW-9	ISRW-10	Total
April 2022	11,144	4,610	9,130	1,440	10,840	2,576	0	9,050	3,460	9,740	**61,990**
March 2022	29,019	8,770	14,820	2,527	15,800	7,547	0	14,910	5,840	15,300	**114,533**
February 2022	1,739	5,670	7,460	1,683	10,350	4,470	0	10,410	4,380	10,700	**56,862**
January 2022	18,367	11,370	14,760	3,130	22,030	11,175	0	15,580	9,120	15,800	**121,332**
December 2021	19,654	12,630	16,419	3,590	24,993	12,315	0	17,498	10,930	17,740	**135,769**
November 2021	18,228	10,761	10,000	1,938	13,831	7,235	0	12,260	8,800	14,360	**97,413**
October 2021	10,700	6,370	7,080	1,560	6,590	2,300	0	8,320	6,000	11,050	**59,970**
September 2021	6,764	4,374	4,749	1,156	4,488	1,041	0	5,823	4,479	8,274	**41,148**
August 2021	7,259	5,426	5,941	1,364	6,312	1,059	0	6,097	5,801	9,846	**49,105**
July 2021	21,441	5,389	6,191	1,411	7,409	1,515	0	5,984	4,786	10,462	**64,588**
June 2021	25,614	10,781	11,809	2,699	16,091	3,085	0	14,606	7,384	16,938	**109,007**
May 2021	31,186	7,854	9,258	2,098	6,850	2,880.0	0	10,672	5,854	13,256	**89,908**
Total	**201,115**	**94,005**	**117,617**	**24,596**	**145,584**	**57,198**	**0**	**131,210**	**76,834**	**153,466**	**1,001,625**

Table 4-4
WIA ISRW Discharge Analytical/Mass Removal Data (2021 - 2022)
Emerald Kalama Chemical, Kalama, WA

Well	May 2021 - October 2021					November 2021 - April 2022					May 2021 - April 2022	
	Groundwater Extracted (gallons)	Avg Benz (Apr, Jul, Oct) (ug/L)	Benz Remvd (lb)	Avg Toluene (Apr, Jul, Oct) (ug/L)	Toluene Remvd (lb)	Groundwater Extracted (gallons)	Avg Benz (Oct, Jan, Apr) (ug/L)	Benz Remvd (lb)	Avg Toluene (Oct, Jan, Apr) (ug/L)	Toluene Remvd (lb)	Benz Remvd (lb)	Toluene Remvd (lb)
ISRW-1	102,964	25	0.02	13,018	11.2	98,151	7	0.0	15,318	13.1	0.0	24
ISRW-2B	40,194	74	0.02	23,233	7.8	53,811	64	0.0	20,867	7.0	0.0	15
ISRW-3	45,028	125	0.05	71,175	26.7	72,589	109	0.0	63,600	23.9	0.1	51
ISRW-4	10,288	13	0.00	2,152	0.2	14,308	9	0.0	1,523	0.1	0.0	0
ISRW-5	47,740	25	0.01	35,500	14.1	97,844	15	0.0	44,433	17.7	0.0	32
ISRW-6	11,880	39	0.00	9,137	0.9	45,318	80	0.0	18,840	1.9	0.0	3
ISRW-7	0	0.0	0.00	0	0.0	0	0	0.0	0	0.0	0.0	0
ISRW-8	51,502	67	0.03	39,700	17.0	79,708	64	0.0	33,667	14.5	0.1	32
ISRW-9	34,304	24	0.01	17,563	5.0	42,530	12	0.0	10,020	2.9	0.0	8
ISRW-10	69,826	160	0.09	48,025	28.0	83,640	100	0.1	42,633	24.8	0.2	53
Total	**413,726**		**0.24**		**111**	**587,899**		**0.2**		**106**	**0.4**	**217**

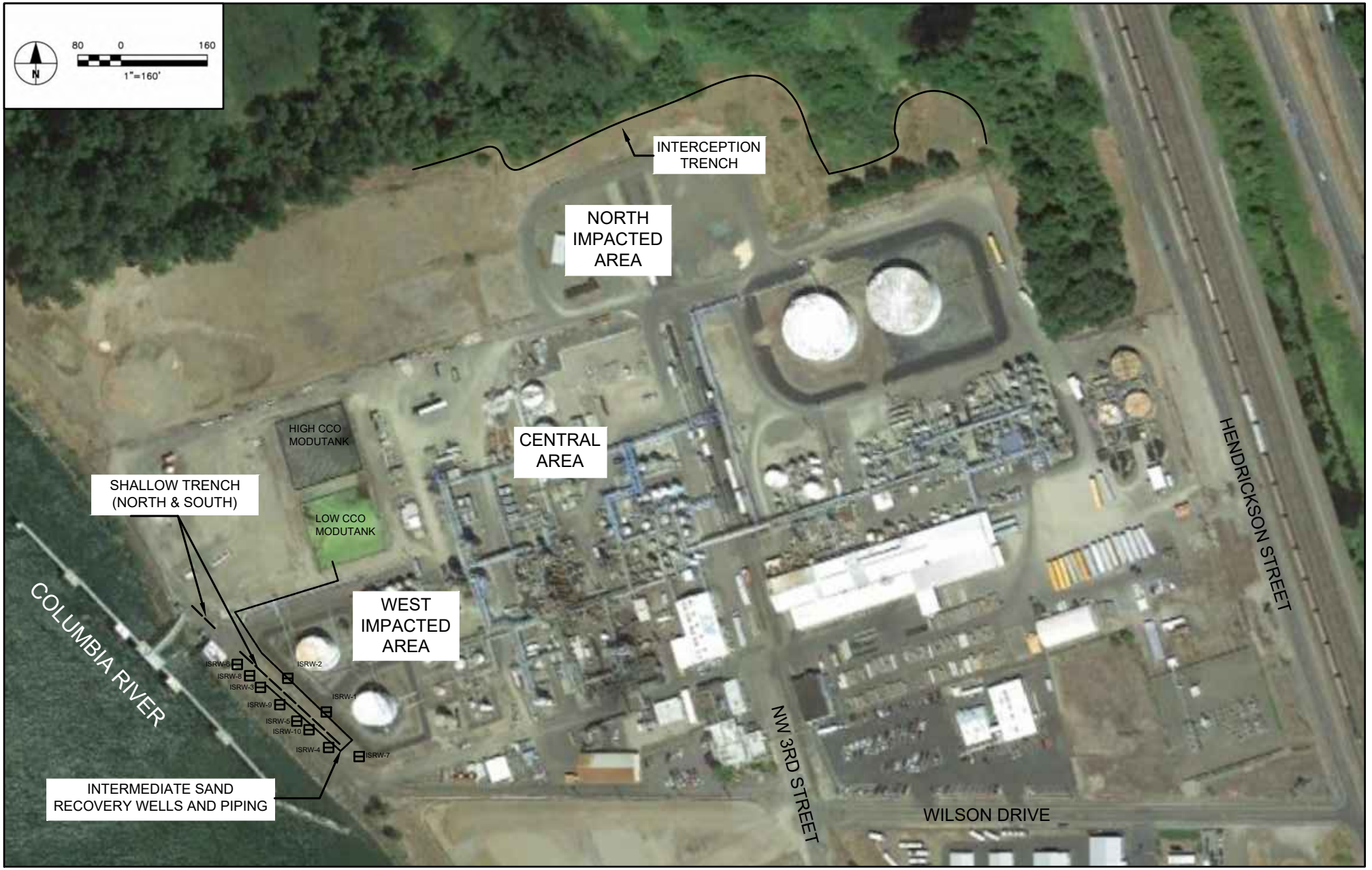
Notes:
Averages include duplicate samples.
Average concentration values are rounded.
ISRW = intermediate sand recovery well; lb = pounds; ug/L = micrograms per liter

Table 4-5
WIA ISRW Discharge Available Year Mass Removal Data (Not All Years Individually Listed)
Emerald Kalama Chemical, Kalama, WA

Year (April - April)	Groundwater Extracted (gallons)	Annual Benzene & Toluene Removal By ISRW Well (lbs)																				Totals	
		ISRW-1		ISRW-2		ISRW-3		ISRW-4		ISRW-5		ISRW-6		ISRW-7		ISRW-8		ISRW-9		ISRW-10			
		Benz	Tol	Benz	Tol	Benz	Tol	Benz	Tol	Benz	Tol	Benz	Tol	Benz	Tol	Benz	Tol	Benz	Tol	Benz	Tol	Benz	Tol
2021-2022	1,001,625	0	24	0	15	0.1	51	0	0	0	32	0	3	0	0	0.1	32	0	8	0	53	**0.4**	**217**
2020-2021	1,737,727	0.1	41	0.1	31	0.1	61	0	2	0.1	102	0	0	0	1	0.2	81	0	34	0	145	**1**	**498**
2019-2020	1,087,500	0.1	34	0.1	30	0.1	34	0	1	0	26	0	1	0	0	0.2	78	0.1	75	0	10	**1**	**289**
2018-2019	1,658,473	0.2	76	0.1	45	0.1	54	0	10	0.1	109	0	3	0.1	0	0.4	184	0	49	0	11	**1**	**541**
2017-2018	2,213,000	1	157	0	76	0	164	0	6	0	173	0	10	1	20	0	128	0	84	0	18	**2**	**836**
2016-2017	3,004,478	0	119	0	97	0	256	0	1	0	154	0	25	1	59	0	107	0	155	0	9	**3**	**982**
2015-2016	3,534,000	0	87	0	174	0	135	0	17	0	12	0	2	11	216	0	150	0	137	0	1	**12**	**931**
2014-2015	4,388,000	0	99	1	279	0	56	0	3	0	5	0	1	3	21	2	520	1	266	0	0	**8**	**1,250**
2013-2014	4,418,508	1	137	0	69	0	21	0	5	0	15	0	9	10	157	1	338	0	288	0	1	**12**	**1,040**
2012-2013	7,786,000	2	443	0	188	0	71	0	0	0	25	0	13	16	324	1	723	0	136	0	1	**19**	**1,924**
2011-2012	9,825,000	3	515	1	187	0	85	0	34	0	20	0	44	45	399	1	1,071	0	91	0	11	**50**	**2,457**
2008-2009	6,307,000	NA	373	NA	231	NA	122	NA	103	NA	181	NA	159	NA	601	NA	225	NA	131	NA	48	**NA**	**2,174**
2004-2005	5,579,000	NA	930	NA	44	NA	373	NA	78	NA	680	NA	190	NA	541	NA	NA	NA	NA	NA	NA	**NA**	**2,836**
2001-2002	5,642,000	NA	797	NA	63	NA	967	NA	78	NA	646	NA	634	NA	531	NA	NA	NA	NA	NA	NA	**NA**	**3,716**
1997-1998	2,733,000	NA	874	NA	407	NA	953	NA	983	NA	355	NA	177	NA	257	NA	NA	NA	NA	NA	NA	**NA**	**4,006**

NOTES: ISRW-7 shut down October 2019. Operated intermitently since. Historically produced highest water volumes but lowest B&T concentrations (Below CUL or BDL more recently). 600K gal of water/year 2017-18 and 2018-19.
1997 - 1998 first full year of system operation

Figures



Kalama Facility Site Layout

Figure 1-1

WETLANDS

STAFF GAUGE
■ Dry

MW-205 (NM)

NTP-2 6.01

NIA INTERCEPTION TRENCH

NTP-WS (NM)

W. SUMP 5.20

NTP-1 5.29

NTP-3 6.81

MW-256 8.73

NTP-ES (NM)

E. SUMP 5.02

MW-20 (NM)

MW-245 10.33

KC-21 (NM)

KC-9 10.34

MW-210 9.59

PZ-102 11.59

HENDRIKSON STREET

KC-23 12.00

KC-8 11.28

PDW-117 12.02

0.005 ft/ft

MW-232 (NM)

MODU TANK

MODU TANK

MW-231 12.67

MW-230 13.00

PZ-104 12.75

KC-24R 12.21

MW-255 9.21

N. SUMP 9.44

USRW-2 10.07

S. SUMP 9.74

0.007 ft/ft

PZ-107 12.90

WIA INTERCEPTION TRENCH

KC-13 8.95

STR-1 10.60

MW-238 11.02

PZ-110 11.16

COLUMBIA RIVER

10

11

12

N

0 150

1" = 150'

LEGEND

- PIEZOMETER
- MONITORING WELL - UPPER SAND UNIT
- WETLANDS STAFF GAUGE
- 13.18 GROUNDWATER ELEVATION (feet)
- 11 POTENTIOMETRIC SURFACE CONTOUR (feet)
- INTERCEPTION TRENCH (NIA & WIA)

2021 - 2022 Annual Remedial Action Report
Emerald Kalama Chemical, LLC
Kalama, Washington

Emerald Kalama Chemical, LLC
Kalama, Washington

RSEC
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ESB/WBE/DBE

Project EKC

UPPER SAND AQUIFER GROUNDWATER ELEVATION MAP - OCTOBER 4, 2021

Figure 2-1

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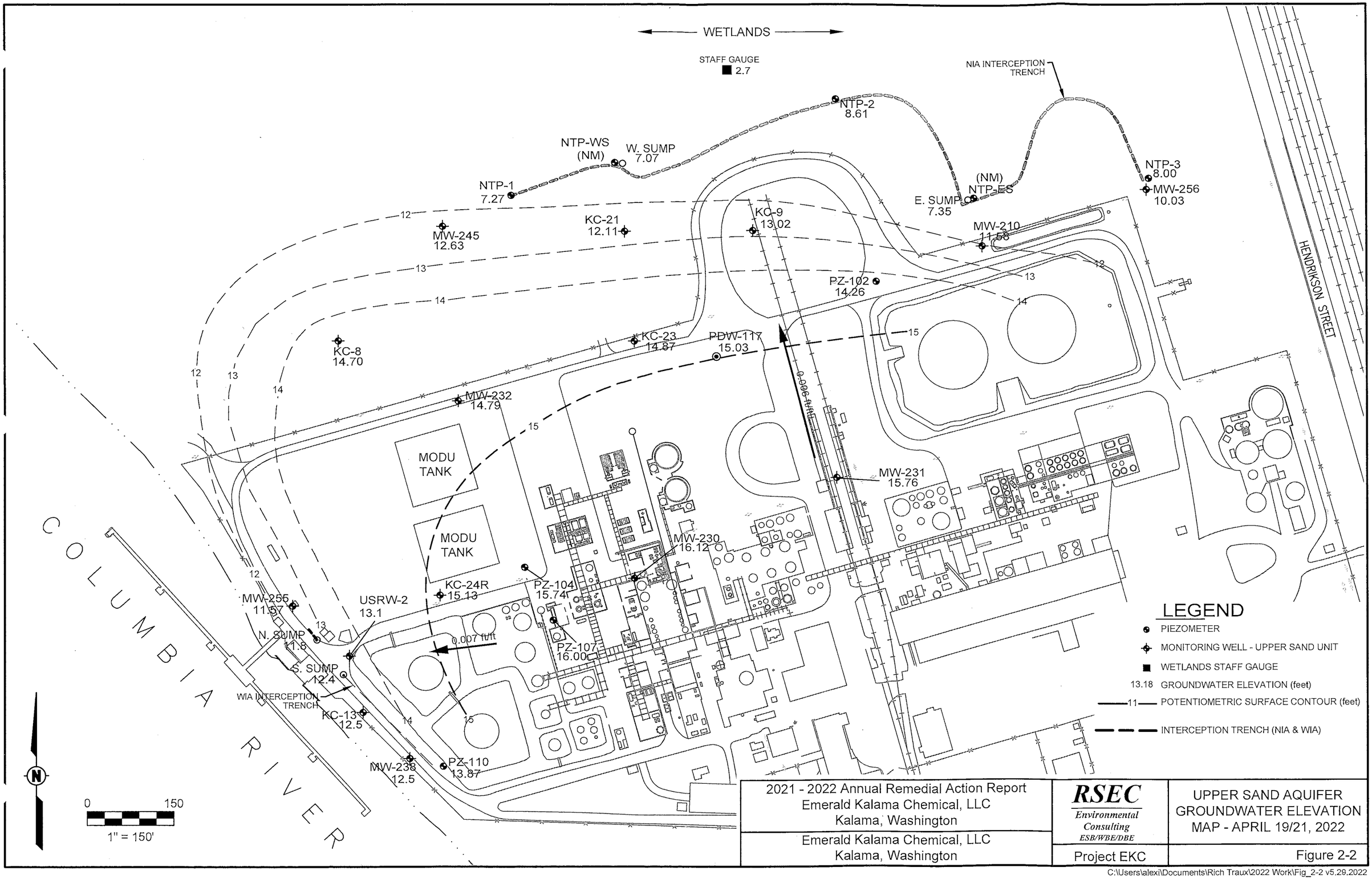

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Emerald Kalama Chemical, LLC
Kalama, Washington

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Kalama, Washington

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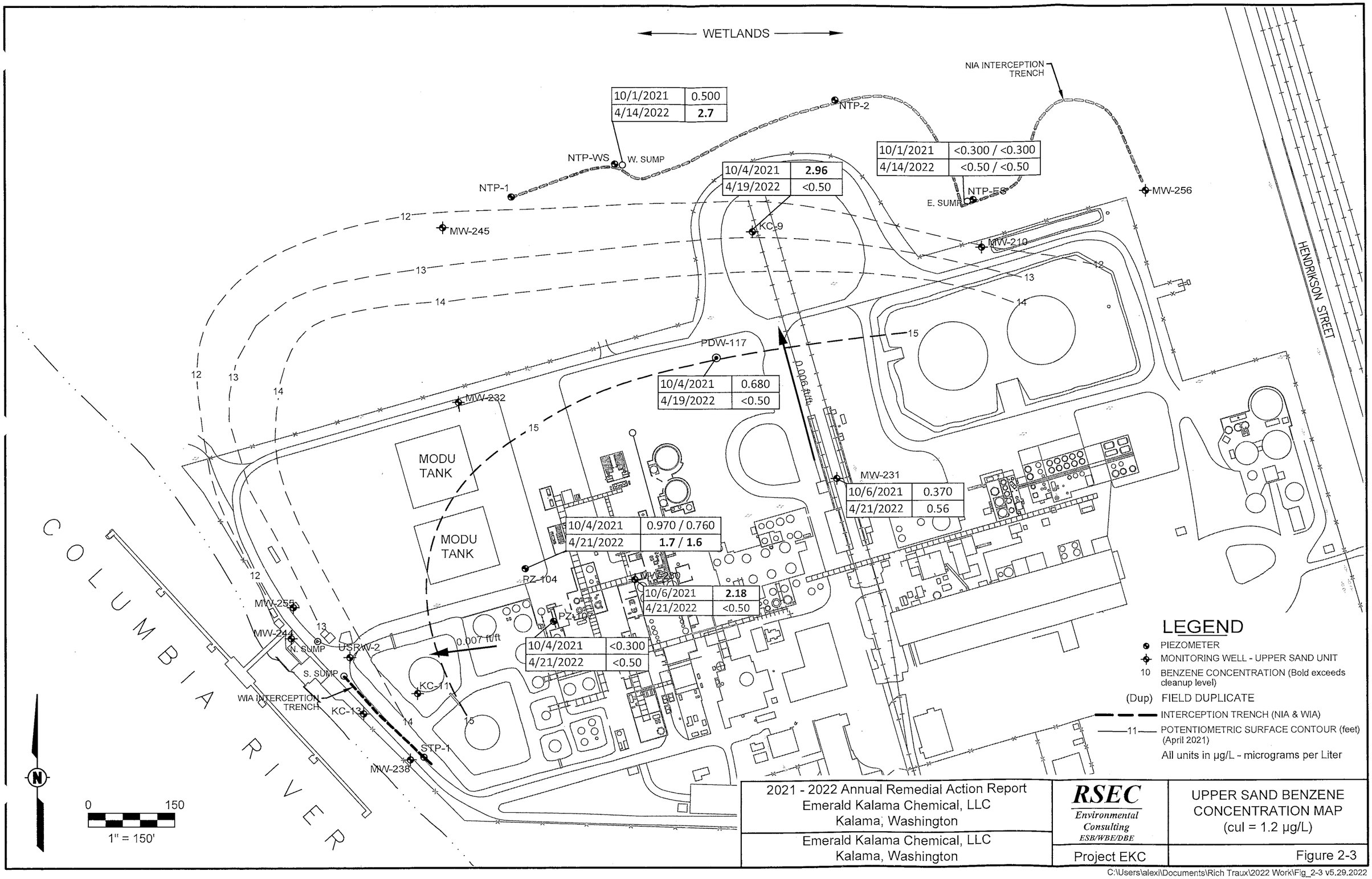
Environmental Consulting
ESB/WBE/DBE

UPPER SAND AQUIFER GROUNDWATER ELEVATION MAP - APRIL 19/21, 2022

Project EKC

Figure 2-2

C:\Users\alexi\Documents\Rich Traux\2022 Work\Fig_2-2 v5.29.2022



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UPPER SAND BENZENE CONCENTRATION MAP
(cul = 1.2 µg/L)

Project EKC

Figure 2-3

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WETLANDS

NIA INTERCEPTION TRENCH

10/1/2021	119
4/14/2022	400

NTP-2

10/1/2021	104
4/14/2022	99

NTP-3

MW-256

10/4/2021	8.24
4/21/2022	14

10/4/2021	**2,630**
4/19/2022	**1,400**

NTP-WS W. SUMP

10/4/2021	101
4/21/2022	97

NTP-1

NTP-ES E. SUMP

MW-245

KC-9

MW-210

HENDRIKSON STREET

12 13 14 15

PDW-117

10/4/2021	**1,030**
4/19/2022	**1,300**

MW-232

8,866 ft

MODU TANK

MODU TANK

10/4/2021	**4,300** / 21.1
4/21/2022	**3,300 / 2,900**

MW-231

10/6/2021	51.1
4/21/2022	45

PZ-104

MW-230

10/6/2021	375
4/21/2022	110

PZ-102

10/4/2021	21.8
4/21/2022	64

0.007 ft/ft

COLUMBIA RIVER

MW-255

MW-244 N. SUMP

USRW-2

S. SUMP

10/6/2021	<0.480
4/19/2022	<1.0

KC-11

KC-13

WIA INTERCEPTION TRENCH

STP-1

MW-238

N

0 150

1" = 150'

LEGEND

- PIEZOMETER
- MONITORING WELL - UPPER SAND UNIT
- 170 DPO CONCENTRATION (Bold exceeds cleanup level)
- (Dup) FIELD DUPLICATE
- INTERCEPTION TRENCH (NIA & WIA)
- 11 POTENTIOMETRIC SURFACE CONTOUR (feet) (April 2021)

All units in µg/L - micrograms per Liter

2021 - 2022 Annual Remedial Action Report
Emerald Kalama Chemical, LLC
Kalama, Washington

Emerald Kalama Chemical, LLC
Kalama, Washington

RSEC Environmental Consulting ESB/WBE/DBE

UPPER SAND DIPHENYL OXIDE CONCENTRATION MAP (cul = 410 µg/L)

Project EKC

Figure 2-4

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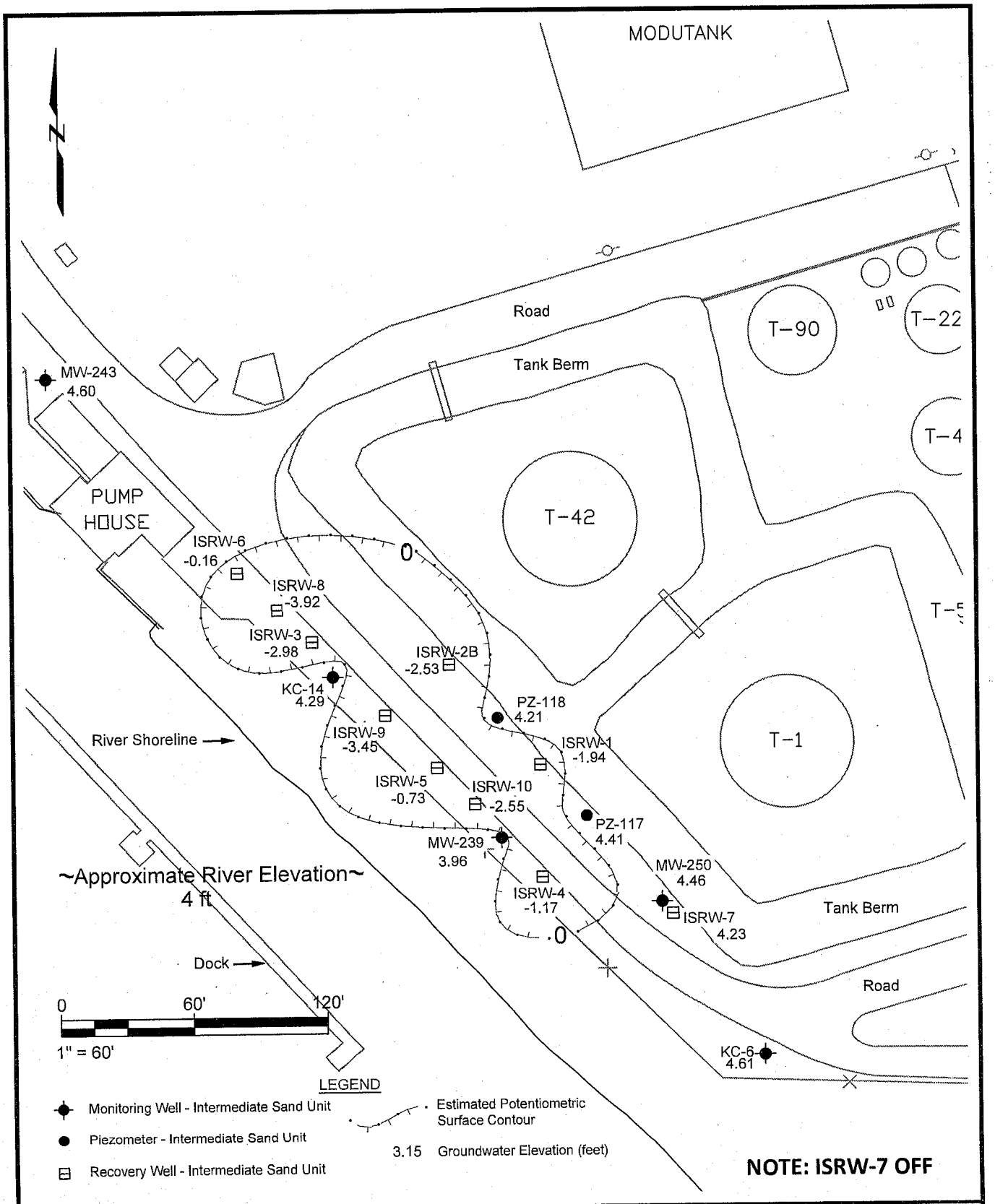
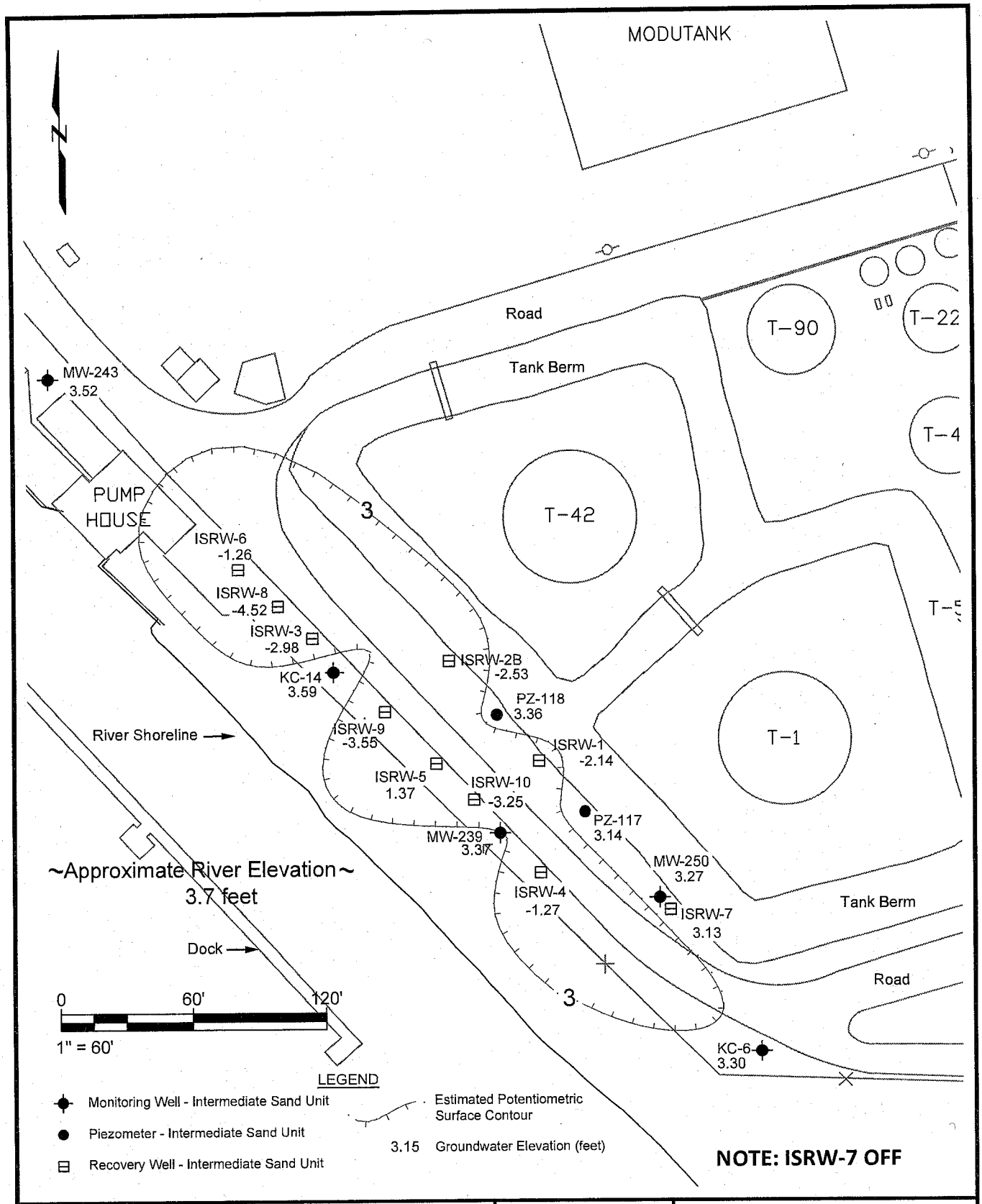


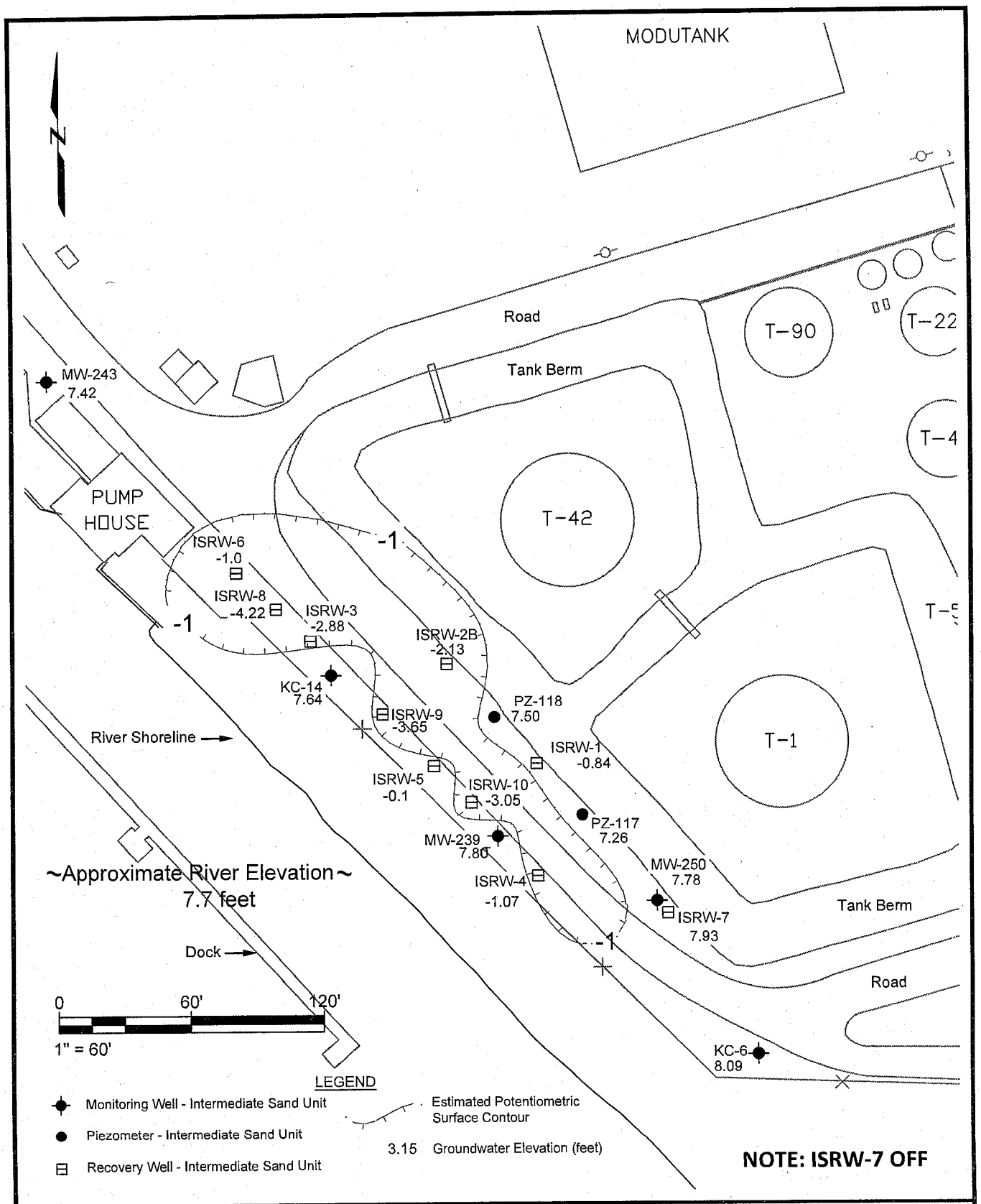
2021 - 2022 Annual Remedial Action Report Emerald Kalama Chemical, LCC Kalama, Washington	**RSEC** *Environmental Consulting* *ESB/WBE/DBE*	WIA Intermediate Sand Aquifer Potentiometric Surface Map July 16, 2021
Emerald Kalama Chemical, LCC Kalama, Washington	Project EKC	Figure 4-1

C:\Users\alexi\Documents\Rich Traux\2022 Work\Fig_4-1 v5.29.2022.dwg - 5/29/2022



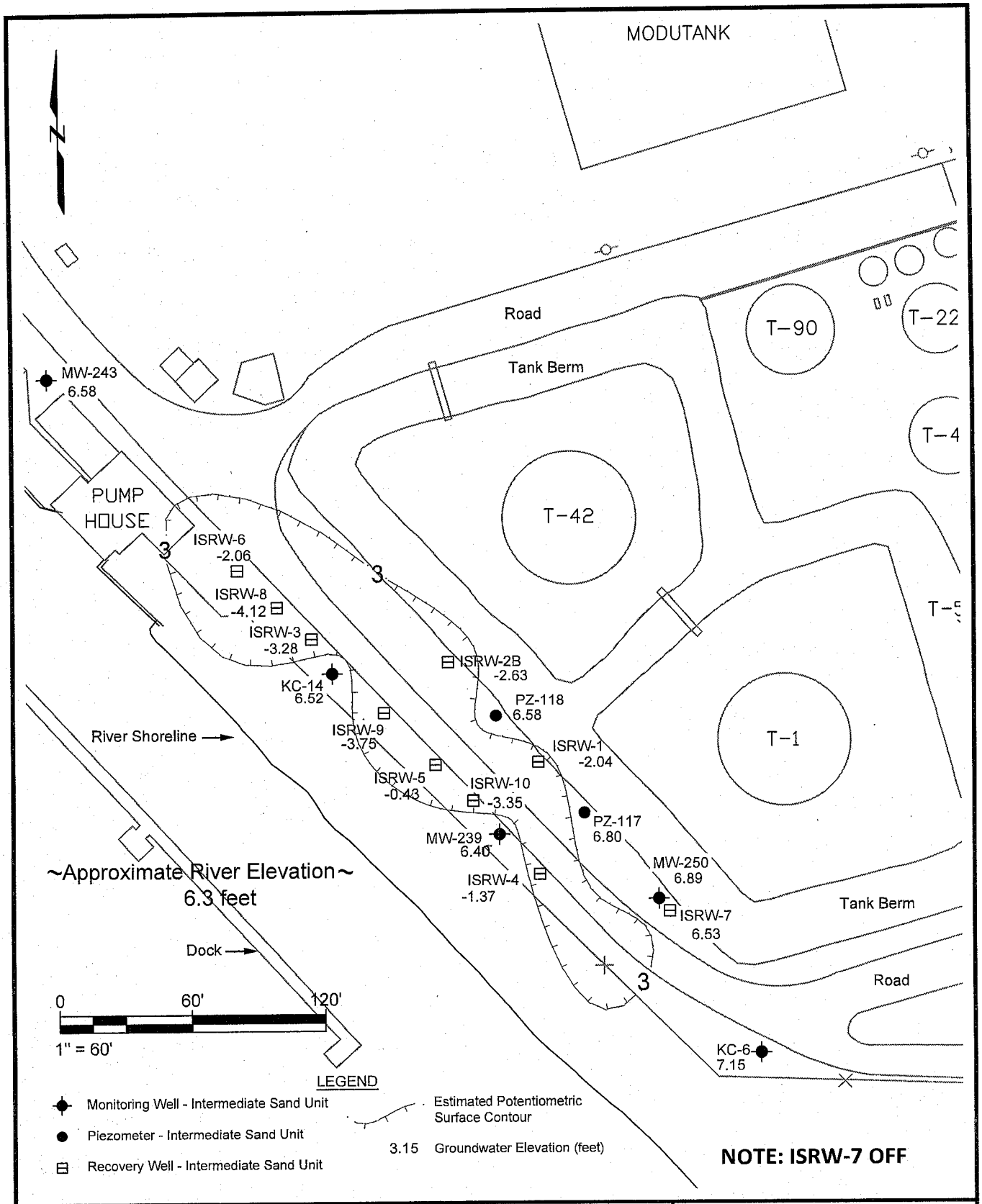
2021 - 2022 Annual Remedial Action Report Emerald Kalama Chemical, LCC Kalama, Washington	**RSEC** *Environmental Consulting* *ESB/WBE/DBE*	WIA Intermediate Sand Aquifer Potentiometric Surface Map October 1, 2021
Emerald Kalama Chemical, LCC Kalama, Washington	Project EKC	Figure 4-2

C:\Users\alexi\Documents\Rich Traux\2022 Work\Fig_4-2 v5.29.2022.dwg - 5/29/2022



2021 - 2022 Annual Remedial Action Report Emerald Kalama Chemical, LCC Kalama, Washington	**RSEC** *Environmental Consulting* *ESB/WBE/DBE*	WIA Intermediate Sand Aquifer January 18, 2022
Emerald Kalama Chemical, LCC Kalama, Washington	Project EKC	Figure 4-3

C:\Users\alexi\Documents\Rich Traux\2022 Work\Fig_4-3 v5.29.2022.dwg - 5/29/2022



2021 - 2022 Annual Remedial Action Report Emerald Kalama Chemical, LCC Kalama, Washington	**RSEC** *Environmental Consulting* *ESB/WBE/DBE*	WIA Intermediate Sand Aquifer April 19, 2022
Emerald Kalama Chemical, LCC Kalama, Washington	Project EKC	Figure 4-4

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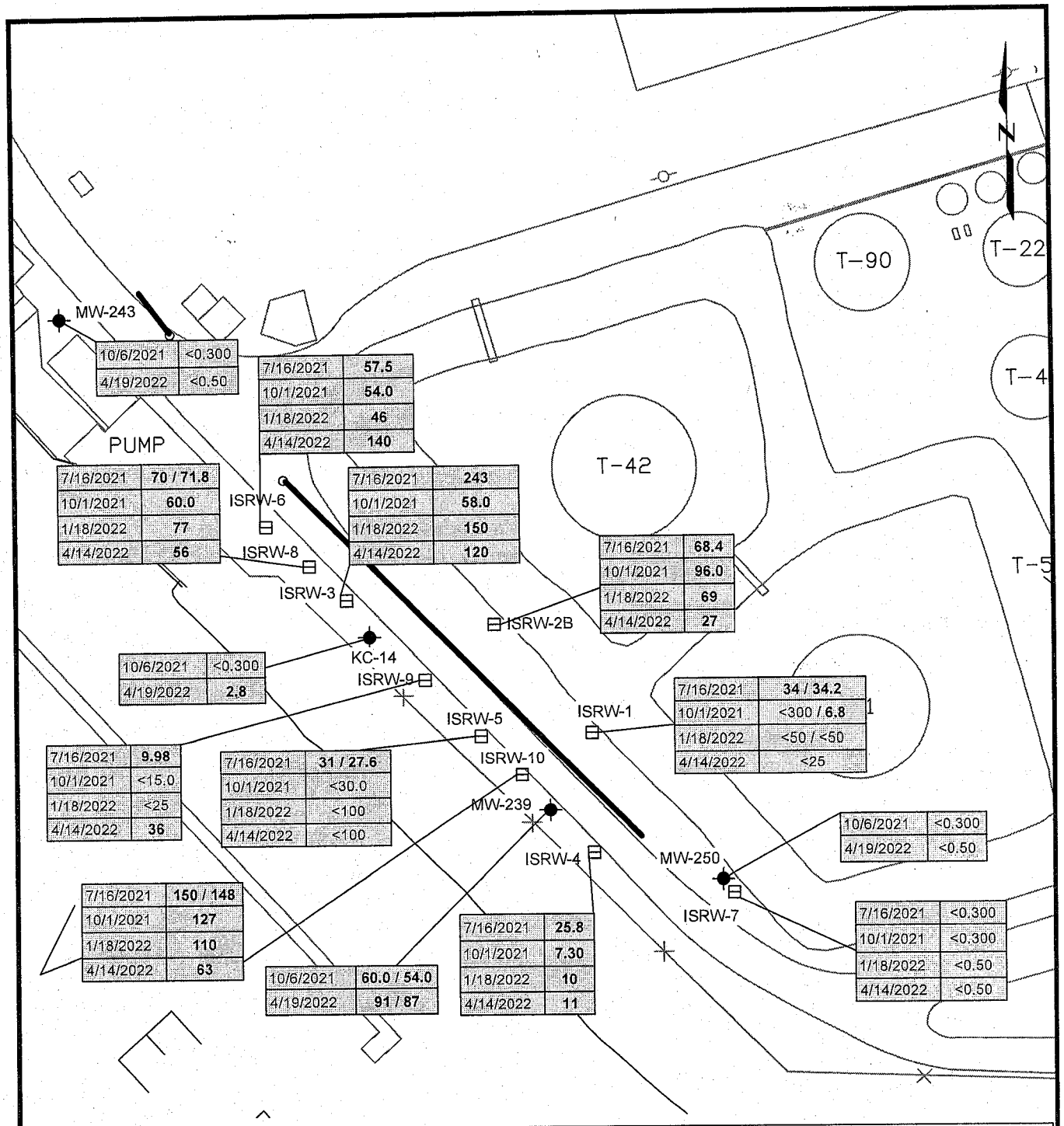

2021 - 2022 Annual Remedial Action Report
Emerald Kalama Chemical, LLC
Kalama, Washington

Emerald Kalama Chemical, LLC
Kalama, Washington

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Environmental Consulting
ESB/WBE/DBE

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WIA Intermediate Sand Aquifer
Benzene Concentrations
(cul = 1.2 µg/L)

Figure 4-5

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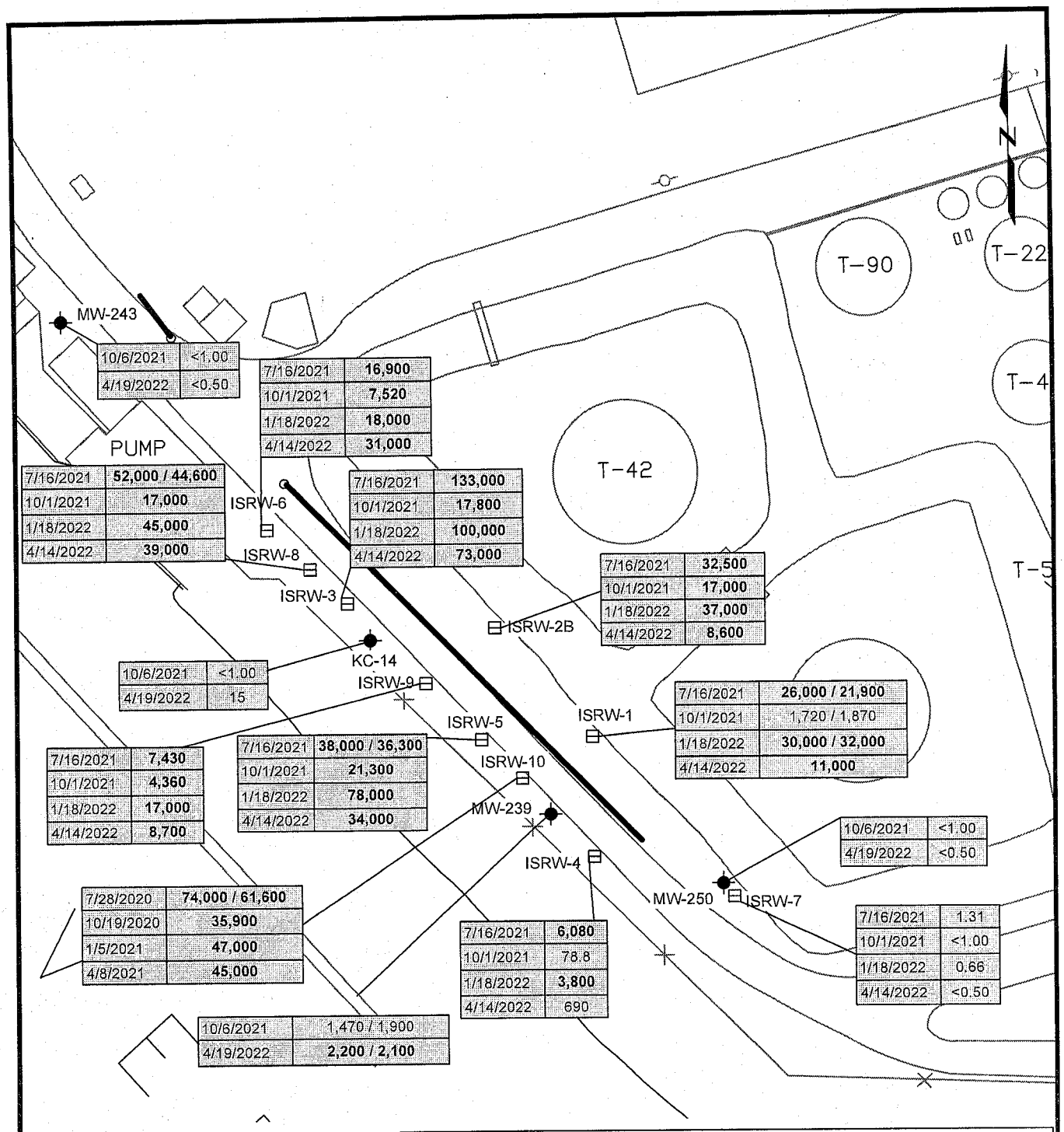

2021 - 2022 Annual Remedial Action Report Emerald Kalama Chemical, LLC Kalama, Washington	**RSEC** *Environmental Consulting* *ESB/WBE/DBE*	WIA Intermediate Sand Aquifer Toluene Concentrations (cul = 2,000 µg/L)
Emerald Kalama Chemical, LLC Kalama, Washington	Project EKC	Figure 4-6

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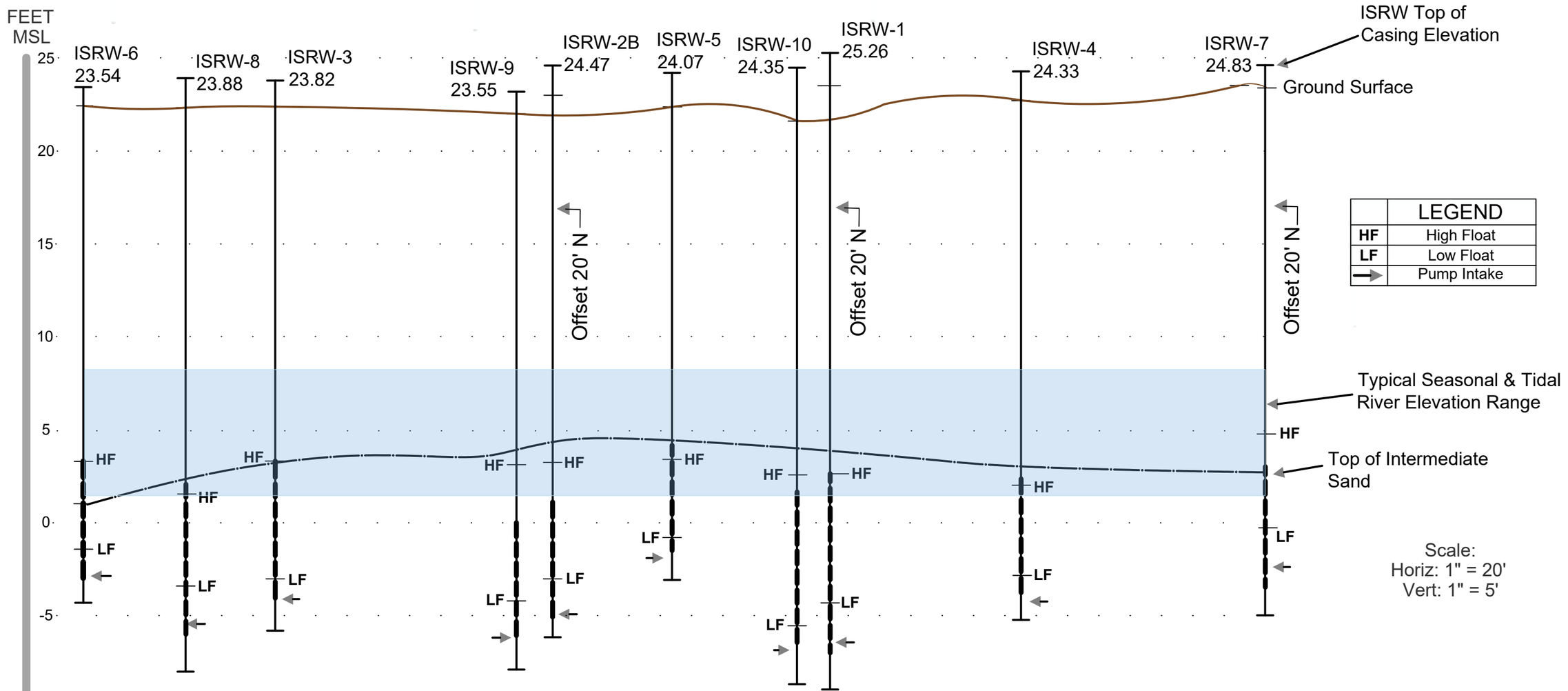
Figure 4-7 ISRW X-Sect.



Site:	Emerald Kalama Chemical	Drawing: 1	Project: 1	Drawn: AK	Notes:	RSEC-INC Environmental & Engineering consulting, INC.
Title:	ISRW Wells X-sect	Scale: Hor 1:20 Vert 1:5	Date: 8.14.2020	Rev: A		

Appendix A

Ground Water Level Tables

Table B NIA Upper Sand Gauging Data

Well	MP Elevation	4/19&21/2022			10/4/2021			4/12/2021			10/19/2020			4/7/2020			10/15/2019			4/12/2019		
		Time	Depth to Water	Ground-water Elevation	Time	Depth to Water	Ground-water Elevation	Time	Depth to Water	Ground-water Elevation	Time	Depth to Water	Ground-water Elevation	Time	Depth to Water	Ground-water Elevation	Time	Depth to Water	Ground-water Elevation	Time	Depth to Water	Ground-water Elevation
KC-8	24.57	1220 / 21	9.87	14.70	1740	13.29	11.28	1445	11.05	13.52	1251	12.78	11.79	1210	11.06	13.51	1155	13.4	11.17	1245	11.14	13.43
KC-9 (2)	21.07	1400 / 19	8.05	13.02	1245	10.73	10.34	1215	8.9	12.17	1332	10.26	10.81	1242	8.95	12.12	1105	10.8	10.27	1427	9.06	12.01
KC-21	24.61	1135 / 21	12.5	12.11	nm	nm	#VALUE!	1340	13.35	11.26	1256	14.72	9.89	1215	13.41	11.20	1140	15.11	9.50	1242	13.61	11.00
KC-23	23.87	1536 / 19	9	14.87	1640	11.87	12.00	1330	9.62	14.25	1335	11.42	12.45	1330	9.72	14.15	1130	11.9	11.97	1421	9.88	13.99
MW-210	26.44	1533 / 19	14.86	11.58	1234	16.75	9.69	1055	15.26	11.18	1324	16.49	9.95	1040	15.40	11.04	1122	17.77	8.67	1236	15.4	11.04
MW-232	24.59	1540 / 19	9.8	14.79	nm	nm	#VALUE!	1500	10.44	14.15	1350	12.54	12.05	1350	10.73	13.86	1215	13.04	11.55	1418	10.74	13.85
MW-245	25.81	1150 / 21	13.18	12.63	1705	15.74	10.07	1400	14.02	11.79	1249	15.48	10.33	1125	14.09	11.72	1010	15.8	10.01	0115	14.24	11.57
MW-256	19.09	1040 / 21	9.06	10.03	1200	10.36	8.73	1105	9.39	9.70	1322	10.02	9.07	1020	9.46	9.63	930	10.5	8.59	1232	9.40	9.69
PZ-102	25.76	1530 / 19	11.5	14.26	1237	14.17	11.59	1050	12.04	13.72	1326	13.69	12.07	1325	12.10	13.66	1120	14.12	11.64	1426	12.21	13.55
NTP-1	23.99	1230 / 21	16.72	7.27	1715	18.7	5.29	1338	18.5	5.49	1248	18.7	5.29	1220	18.14	5.85	1150	18.73	5.26	1230	18.66	5.33
NTP-2	16.91	1142 / 21	8.3	8.61	1750	10.9	6.01	1205	9.25	7.66	#######	10.9	6.01	1105	9.77	7.14	1141	NM	NM	1239	10.54	6.37
NTP-3	15.61	1100 / 21	7.61	8.00	1215	8.8	NM	1140	7.6	NM	1320	8.9	NM	NM	NM	NM	945	8.8	6.81	1233	8.26	7.35
NTP-WS	14.79										1246	dry	dry	1051	9.2	5.59	dry		dry	1226	9.7	5.09
MW-201	14.76										obstructed		NM	1215	5.24	9.52	NM		NM	1249	4.8	9.96
MW-205	12.77										obstructed		NM	tree obstruction		NM	NM		NM	NM	NM	NM
East Sump	13.47	1115 / 21	6.12	7.35	1220	8.45	5.02	1200	6.3	7.17	1315	8.4	5.07	1045	8.05	5.42	1115	8.4	5.07	1234	7.83	5.64
West Sump	13.62	1138 / 21	6.55	7.07	1740	8.42	5.20	1335	8.4	5.22	1245	8.6	5.02	1050	8.07	5.55	1146	8.75	4.87	1225	9.24	4.38
Staff Gauge	8.17	1145 / 21	2.7	2.70			dry	1350	~2	1.30	1250	dry	dry	1100	1.3	1.30	1143	dry	dry	1330	~1.6	~1.6

Notes:

Wetlands staff gauge used to measure surface water elevation

NM - Not Measured - due to either wetland flooding or other obstruction.

NTP-ES&WS, MW-201 & -205 Removed from gauging per Ecy 10/21/20 apprvl.

(2) - New MP elevation starting April 20, 2015 data due to RR infrastructure changes

Table B CIA Upper Sand Gauging Data

Well	MP Elevation	4/19&21/2022			10/4/2021			4/12/2021			10/19/2020			4/7/2020			10/15/2019			4/12/2019		
		Time	Depth to Water	Ground-water Elevation	Time	Depth to Water	Ground-water Elevation	Time	Depth to Water	Ground-water Elevation	Time	Depth to Water	Ground-water Elevation	Time	Depth to Water	Ground-water Elevation	Time	Depth to Water	Ground-water Elevation	Time	Depth to Water	Ground-water Elevation
KC-9 (2)	21.07	1400 / 19	8.05	13.02	1245	10.73	10.34	1215	8.9	12.17	1332	10.26	10.81	1242	8.95	12.12	1330	10.8	10.27	1427	9.06	12.01
MW-210	26.44	1533 / 19	14.86	11.58	1234	16.75	9.69	1055	15.26	11.18	1324	16.49	9.95	1040	15.40	11.04	1122	17.77	8.67	1236	15.40	11.04
MW-230	26.16	1300 / 21	10.04	16.12	1503(10/1)	13.16	13.00	1610	10.2	15.96	1342	12.86	13.30	1340	10.42	15.74	1238	13.18	12.98	1350	10.62	15.54
MW-231 (2)	22.15	850 / 21	6.39	15.76	0830(10/6)	9.48	12.67	0930	6.76	15.39			22.15	4/9 - 1445	6.91	15.24	1900	9.49	12.66	1635	7.10	15.05
PDW-117	25.85	1445 / 19	10.82	15.03	1440	13.83	12.02	1000	11.38	14.47	1337	13.38	12.47	1035	11.49	14.36	1100	13.90	11.95	1422	11.62	14.23
PZ-104	24.83	1430 / 21	9.09	15.74	1457(10/1)	12.08	12.75	1510	9.32	15.51	1349	11.75	13.08	1350	9.53	15.30	1230	12.14	12.69	1345	9.66	15.17
PZ-107	25.5	1340 / 21	9.5	16.00	1500(10/1)	12.6	12.90	1810	9.68	15.82	1346	12.25	13.25	1345	9.90	15.60	1235	12.64	12.86	1347	10.03	15.47

Notes: 1 - Facility RR extension temporarily blocked well

Notes: 2 - New MP elevation starting April 20, 2015 data due to RR infrastructure changes

Table B WIA Upper Sand Gauging Data

Well	MP Elevation	4/19&21/2022			10/1/2021			4/13/2021			10/19/2020			4/7/2020			10/15/2019			4/12/2019		
		Time	Depth to Water	Ground-water Elevation	Time	Depth to Water	Ground-water Elevation	Time	Depth to Water	Ground-water Elevation	Time	Depth to Water	Ground-water Elevation	Time	Depth to Water	Ground-water Elevation	Time	Depth to Water	Ground-water Elevation	Time	Depth to Water	Ground-water Elevation
KC-13	23.34	0 / 21	10.84	12.5	1445	14.39	8.95	1448	11.29	12.05	918	13.14	10.2	1420	11.20	12.14	1315	14.4	8.94	1450	10.32	13.02
KC-24R	24.76	1450 / 21	9.63	15.13	1454	12.55	12.21	1445	10	14.76	936	12.16	12.6	1415	10.14	14.62	1245	12.57	12.19	1409	10.24	14.52
MW-238	25.10	0 / 21	12.60	12.5	1440	14.08	11.02	1452	13.42	11.68	920	14.19	10.91	1430	13.28	11.82	1318	15.01	10.09	1447	12.32	12.78
MW-244	25.98										914	16.54	9.44	1405	15.65	10.33	1305	16.92	9.06	1455	13.30	12.68
MW-255	21.96	1542 / 19	10.39	11.57	1451	12.75	9.21	1515	11.03	10.93	935	12.27	9.69	1400	10.98	10.98	1303	12.83	9.13	1405	9.63	12.33
PZ-110	25.76	0 / 21	11.89	13.87	1442	14.6	11.16	1500	12.29	13.47	925	14.23	11.53	1432	12.59	13.17	1320	14.59	11.17	1442	12.19	13.57
USRW-2	22.85	1310 / 19	9.75	13.1	1447	12.78	10.07	1720	10.38	12.47	932	12.22	10.63	1410	10.26	12.59	1416	12.88	9.97	1403	9.69	13.16
STP-1	23.15										939	12.55	10.6	1430	10.58	12.57	1418	12.9	10.25	1358	9.98	13.17
N. SUMP	23.29	1545 / 19	11.5	11.79	1449	13.85	9.44	1442	12.18	11.11	934	13.42	9.87	1403	12.00	11.29		nm		1400	10.7	12.59
S. SUMP	23.34	1543 / 19	10.9	12.44	1446	13.6	9.74	1440	10.68	12.66	930	12.92	10.42	1408	10.55	12.79		nm		1401	9.95	13.39

NOTES:
KC-12, KC-15, KCP-6, PZ-106 REMOVED FROM GAUGING PER ECY 112916 LTR
MW-244 & STP-1 Removed from gauging per Ecy 10/21/20 Apprvl

Table B WIA Intermediate Sand Gauging Data

Well	Updated MP Elevation 7-2019 (#4,5,7,8 stkup lowered 7-15-19)	4/19/2022 (#7 OFF)			1/18/2022 (#7 OFF)			10/1/2021 (#7 OFF)			7/16/2021 (#7 OFF)			4/13/2021			January 15, 2021			Oct
		HT0543 +5 / LT1417 -.02			LT10:30a+1.2/HT3:20p+4.4			1330 HT+3/7-off			HT0840+3.5/LT1600+0.3			1300LT+0.23/1740HT+3.4						0630HT+2
		Time	DTW	GW Elev (7-15-19 MP)	Time	DTW	GW Elev (7-15-19 MP)	Time	DTW	GW Elev (7-15-19 MP)	Time	DTW	GW Elev (7-15-19 MP)	Time	DTW	GW Elev (7-15-19 MP)	Time	DTW	GW Elev (7-15-19 MP)	Time
River	0 - MSL	930		6.30	1334		7.7	1400		3.7	1200		4+/-		2.5(+/- 0.5?)		1220		10.7	910
KC-6	25.02	937	17.87	7.15	1426	16.93	8.09	1435	21.72	3.30		20.41	4.61	1303	20.64	4.38		14.34	10.68	921
KC-14	23.29	952	16.77	6.52	1342	15.83	7.46	1419	19.70	3.59		19.00	4.29	1300	19.84	3.45		13.52	9.77	915
MW-239	25.35	956	18.95	6.40	1413	17.55	7.80	1437	21.98	3.37		21.39	3.96	1215	21.95	3.40		15.54	9.81	919
MW-243	25.9	945	19.32	6.58	1338	18.48	7.42	1410	22.38	3.52		21.30	4.60	1330	21.85	4.05		15.80	10.10	912
MW-250	26.12	935	19.23	6.89	1416	18.34	7.78	1433	22.85	3.27		21.66	4.46	1135	21.83	4.29		15.93	10.19	923
PZ-117	25.92	940	19.12	6.80	1408	18.66	7.26	1430	22.78	3.14		21.51	4.41	1457	22.39	3.53		15.94	9.98	926
PZ-118	25.18	942	18.60	6.58	1405	17.68	7.50	1421	21.82	3.36		20.97	4.21	1450	21.63	3.55		15.39	9.79	928
ISRW-1	25.26	1035	27.30	-2.04	1400	26.1	-0.84	1426	27.40	-2.14		27.20	-1.94	1312	27.4	-2.14		26.70	-1.44	1007
ISRW-2b	24.47	1038	27.10	-2.63	1350	26.6	-2.13	1320	27.00	-2.53		27.00	-2.53	1320	27.0	-2.53		26.75	-2.28	958
ISRW-3	23.82	1009	27.10	-3.28	1320	26.7	-2.88	1334	26.80	-2.98		26.80	-2.98	1323	26.7	-2.88		26.80	-2.98	954
ISRW-4	24.33	1024	25.70	-1.37	1409	25.4	-1.07	1345	25.60	-1.27		25.50	-1.17	1308	25.6	-1.27		24.90	-0.57	1012
ISRW-5	24.07	1015	24.50	-0.43	1355	24.0	0.07	1340	22.70	1.37		25.00	-0.93	1315	24.9	-0.83		22.70	1.37	1003
ISRW-6	23.54	1000	25.60	-2.06	1325	24.5	-0.96	1332	24.80	-1.26		23.70	-0.16	1326	22.7	0.84		19.20	4.34	950
ISRW-7	24.83	1030	18.30	6.53	1423	16.9	7.93	1350	21.70	3.13		20.60	4.23	1305	21.3	3.53		15.50	9.33	1014
ISRW-8	23.88	1004	28.00	-4.12	1315	28.1	-4.22	1333	28.40	-4.52		27.80	-3.92	1325	28.0	-4.12		26.60	-2.72	952
ISRW-9	23.55	1012	27.30	-3.75	1345	27.2	-3.65	1336	27.10	-3.55		27.00	-3.45	1318	26.9	-3.35		27.00	-3.45	953
ISRW-10	24.35	1020	27.70	-3.35	1358	27.4	-3.05	1343	27.60	-3.25	1300	26.90	-2.55	1310	27.0	-2.65		25.90	-1.55	1010

Notes: Rvr Gage Cleaned / good Rvr Gage unreadable / est

Wells MW-236, MW-249, and KC-17 removed from elevation gauging program per 11/29/16 Ecology approval Letter

River staff gauge used to estimate elevation of Columbia River, High/Low Tide based on NOAA Tide Table

NM - Not measured.

ISRW 1 - 10 are pumping wells, water levels set by control floats & pump cycles

NOTE MW-249, KC17, MW-236 GAUGING CEASED 112916 ECY LTR

ober 19, 2020		7/14/2020(See Note below)			4/7/2020			1/7/2020			10/15/19 Semi-Ann Smpling			7/30/19 interim/Qtrly			4 /12/ 2019 Semi-Annual Smpling		
.7/1330LT+0.4		LT+1@7a/HT+2.6@noon			LT:1115 / HT:4p			H 12:20 +4.3			Lo-Tide @ Noon +0.5' / Hi @ 6			NOAA Tide Lo -0.46@1100/Hi+2.24			NOAA Tide Hi +4.3@0900, Lo -0.5@1800		
DTW	GW Elev (7-15-19 MP)	Time	DTW	GW Elev (7-15-19 MP)	Time	DTW	GW Elev (7-15-19 MP)	Time	DTW	GW Elev (7-15-19 MP)	Time	DTW	GW Elev (7-15-19 MP)	Time	DTW	GW Elevation (new 7-15-19) MP Elev	Time	DTW	Ground-water Elevation
	4.3	1410		4.5?(est)	1635		7			7.1	1425		3.7	1100		2.90	1200		12.7
20.13	4.89	1450	20.09	4.93	1659	18.66	6.36	11-1230	19.10	5.92	1330	21.54	3.48	1122	21.09	3.93	1440	12.90	12.04
18.59	4.70		18.72	4.57	1640	17.13	6.16		17.11	6.18	1350	20.38	2.91	1106	20.14	3.15	1449	11.32	12.01
20.81	4.54	1456	21.00	4.35	1648	19.09	6.26		19.37	5.98	1355	22.41	2.94	1118	22.33	3.02	1444	13.30	12.00
20.95	4.95	1412	20.99	4.91	1638	20.20	5.70		19.99	5.91	1307	22.55	3.35	1103	21.90	4.00	1458	14.10	11.80
21.22	4.90	1446	21.50	4.62	1655	19.95	6.17		20.35	5.77	1332	22.86	3.26	1115	22.26	3.86	1441	14.19	11.87
21.12	4.80	1444	21.30	4.62	1651	20.26	5.66		20.45	5.47	1340	22.76	3.16	1110	22.25	3.67	1443	13.97	11.91
20.53	4.65	1431	20.58	4.60	1643	19.25	5.93		19.38	5.80	1345	22.10	3.08	1112	21.68	3.50	1448	13.38	11.75
29.00	-3.74	1434	28.3	-3.04	1708	24.6	0.66		27.00	-1.74	1343	28.62	-3.36	1143	28.90	-3.64	1145	25.7	-0.38
27.00	-2.53	1424	27.1	-2.63	1725	26.3	-1.83		26.60	-2.13	1347	26.90	-2.43	1140	26.70	-2.23	1152	25.3	-0.68
27.00	-3.18		26.3	-2.48	1730	26.7	-2.88		26.50	-2.68	1410	24.97	-1.15	1128	24.80	-0.98	1155	23.5	0.49
25.80	-1.47	1452	25.3	-0.97	1702	25.3	-0.92		24.50	-0.17	1337	24.72	-0.39	1153	24.90	-0.57	1140	26.1	-0.82
24.10	-0.03	1427	23.0	1.07	1710	23.0	1.07		23.00	1.07	1400	24.54	-0.47	1135	22.55	1.52	1147	22.3	3.2
20.70	2.84	1414	18.5	5.03	1735	18.5	5.07		23.80	-0.26	1415	24.83	-1.29	1120	24.35	-0.81	1159	24.8	-1.23
22.70	2.13		20.3	4.58	1700	18.7	6.10		19.06	5.77	1335	21.79	3.04	1200	23.00	1.83	1137	22.4	3.81
28.00	-4.12		27.8	-3.92	1732	27.9	-4.02		27.30	-3.42	1412	27.94	-4.06	1125	26.90	-3.02	1157	26.4	-1.60
27.20	-3.65		26.6	-3.05	1720	27.0	-3.45		27.20	-3.65	1403	26.50	-2.95	1145	27.05	-3.50	1150	26.8	-2.66
27.60	-3.25		27.2	-2.85	1705	27.3	-2.90		26.90	-2.55	1358	26.85	-2.50	1158	26.80	-2.45	1142	25.5	-2.15

Appendix B

Laboratory Reports: Oct.-2021 and April-2022 (transmitted via e-file)

July 2021 ISRW Quarterly Laboratory Reports

Specialty Analytical & Selected Dupes to ALS Laboratory

Specialty Analytical

9011 SE Jannsen Rd
Clackamas, OR 97015
TEL: (503) 607-1331
Website: www.specialtyanalytical.com

August 05, 2021

Rich Truax
RSEC Environmental Inc.
958 Hood View Ct.
Hood River, OR 97031
TEL: (541) 490-4223
FAX:

RE: EKC/ EKC-0721 Order No.: 2107129

Dear Rich Truax:

There were no problems with the analysis and all data for associated QC met EPA or laboratory specifications, except where noted in the Case Narrative, or as qualified with flags. Results apply only to the samples analyzed. Without approval of the laboratory, the reproduction of this report is only permitted in its entirety.

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

Sincerely,

Marty French
Lab Director

CLIENT: RSEC Environmental Inc.
Project: EKC/ EKC-0721

Lab ID: 2107129-001 **Matrix:** GROUNDWATER
Client Sample ID ISRW-1 **Collection Date:** 7/16/2021 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
BTEX - RBC				**SW8021B**	**SW 5030B**	Analyst: **TB**
Benzene	34.2	6.00		µg/L	20	7/20/2021 8:18:00 PM
Toluene	21900	500		µg/L	1000	7/19/2021 5:56:00 PM
Surr: 4-Bromofluorobenzene	110	74.8 - 126		%Rec	20	7/20/2021 8:18:00 PM

Lab ID: 2107129-002 **Matrix:** GROUNDWATER
Client Sample ID ISRW-2b **Collection Date:** 7/16/2021 9:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
BTEX - RBC				**SW8021B**	**SW 5030B**	Analyst: **TB**
Benzene	68.4	6.00		µg/L	20	7/21/2021 1:56:00 PM
Toluene	32500	500		µg/L	1000	7/19/2021 6:20:00 PM
Surr: 4-Bromofluorobenzene	109	74.8 - 126		%Rec	1000	7/19/2021 6:20:00 PM

Lab ID: 2107129-003 **Matrix:** GROUNDWATER
Client Sample ID ISRW-3 **Collection Date:** 7/16/2021 9:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
BTEX - RBC				**SW8021B**	**SW 5030B**	Analyst: **TB**
Benzene	243	15.0		µg/L	50	7/21/2021 2:20:00 PM
Toluene	133000	500		µg/L	1000	7/19/2021 6:53:00 PM
Surr: 4-Bromofluorobenzene	108	74.8 - 126		%Rec	1000	7/19/2021 6:53:00 PM

Lab ID: 2107129-004 **Matrix:** GROUNDWATER
Client Sample ID ISRW-4 **Collection Date:** 7/16/2021 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
BTEX - RBC				**SW8021B**	**SW 5030B**	Analyst: **TB**
Benzene	25.8	0.600		µg/L	2	7/21/2021 2:44:00 PM
Toluene	6080	500		µg/L	1000	7/19/2021 7:07:00 PM
Surr: 4-Bromofluorobenzene	108	74.8 - 126		%Rec	1000	7/19/2021 7:07:00 PM

Qualifiers: H Holding times for preparation or analysis exceeded S Spike Recovery outside accepted recovery limits

CLIENT: RSEC Environmental Inc.
Project: EKC/ EKC-0721

Lab ID: 2107129-005 **Matrix:** GROUNDWATER
Client Sample ID ISRW-5 **Collection Date:** 7/16/2021 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
BTEX - RBC				**SW8021B**	**SW 5030B**	Analyst: **TB**
Benzene	27.6	6.00		µg/L	20	7/21/2021 3:08:00 PM
Toluene	36300	500		µg/L	1000	7/19/2021 7:31:00 PM
Surr: 4-Bromofluorobenzene	108	74.8 - 126		%Rec	1000	7/19/2021 7:31:00 PM

Lab ID: 2107129-006 **Matrix:** GROUNDWATER
Client Sample ID ISRW-6 **Collection Date:** 7/16/2021 9:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
BTEX - RBC				**SW8021B**	**SW 5030B**	Analyst: **TB**
Benzene	57.5	1.50		µg/L	5	7/21/2021 3:32:00 PM
Toluene	16900	500		µg/L	1000	7/20/2021 8:54:00 AM
Surr: 4-Bromofluorobenzene	108	74.8 - 126		%Rec	1000	7/20/2021 8:54:00 AM

Lab ID: 2107129-007 **Matrix:** GROUNDWATER
Client Sample ID ISRW-7 **Collection Date:** 7/16/2021 10:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
BTEX - RBC				**SW8021B**	**SW 5030B**	Analyst: **TB**
Benzene	ND	0.300		µg/L	1	7/20/2021 7:31:00 PM
Toluene	1.31	0.500		µg/L	1	7/20/2021 7:31:00 PM
Surr: 4-Bromofluorobenzene	110	74.8 - 126		%Rec	1	7/20/2021 7:31:00 PM

Lab ID: 2107129-008 **Matrix:** GROUNDWATER
Client Sample ID ISRW-8 **Collection Date:** 7/16/2021 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
BTEX - RBC				**SW8021B**	**SW 5030B**	Analyst: **TB**
Benzene	71.8	6.00		µg/L	20	7/21/2021 3:55:00 PM
Toluene	44000	500		µg/L	1000	7/20/2021 5:31:00 PM
Surr: 4-Bromofluorobenzene	109	74.8 - 126		%Rec	1000	7/20/2021 5:31:00 PM

Qualifiers: H Holding times for preparation or analysis exceeded S Spike Recovery outside accepted recovery limits

CLIENT: RSEC Environmental Inc.
Project: EKC/ EKC-0721

Lab ID: 2107129-009 **Matrix:** GROUNDWATER
Client Sample ID ISRW-9 **Collection Date:** 7/16/2021 10:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
BTEX - RBC				**SW8021B**	**SW 5030B**	Analyst: **TB**
Benzene	9.98	6.00		µg/L	20	7/21/2021 4:19:00 PM
Toluene	7430	500		µg/L	1000	7/20/2021 5:55:00 PM
Surr: 4-Bromofluorobenzene	110	74.8 - 126		%Rec	1000	7/20/2021 5:55:00 PM

Lab ID: 2107129-010 **Matrix:** GROUNDWATER
Client Sample ID ISRW-10 **Collection Date:** 7/16/2021 10:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
BTEX - RBC				**SW8021B**	**SW 5030B**	Analyst: **TB**
Benzene	148	3.00		µg/L	10	7/21/2021 4:43:00 PM
Toluene	61600	500		µg/L	1000	7/20/2021 6:19:00 PM
Surr: 4-Bromofluorobenzene	109	74.8 - 126		%Rec	1000	7/20/2021 6:19:00 PM

Lab ID: 2107129-011 **Matrix:** GROUNDWATER
Client Sample ID NIA- E. Sump **Collection Date:** 7/16/2021 11:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS				**SW8260D**	**SW 5030B**	Analyst: **CK**
Benzene	2.19	0.300		µg/L	1	7/22/2021 5:44:00 PM
Toluene	1.15	1.00		µg/L	1	7/22/2021 5:44:00 PM
Surr: 1,2-Dichloroethane-d4	112	75.3 - 126		%Rec	1	7/22/2021 5:44:00 PM
Surr: 4-Bromofluorobenzene	102	78.1 - 120		%Rec	1	7/22/2021 5:44:00 PM
Surr: Dibromofluoromethane	96.6	74.2 - 122		%Rec	1	7/22/2021 5:44:00 PM
Surr: Toluene-d8	97.0	76.2 - 135		%Rec	1	7/22/2021 5:44:00 PM

Qualifiers: H Holding times for preparation or analysis exceeded S Spike Recovery outside accepted recovery limits

QC SUMMARY REPORT

Specialty Analytical

WO#: **2107129**

8/5/2021

Client: RSEC Environmental Inc.

Project: EKC/ EKC-0721 **TestCode: 8260_W**

Sample ID: **CCV MSVWS-3043**	SampType: **CCV**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **41178**
Client ID: **CCV**	Batch ID: **18224**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **7/21/2021**	SeqNo: **531207**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	34.0	0.300	40.00	0	84.9	80	120				
Toluene	41.0	1.00	40.00	0	103	80	120				

Sample ID: **MB**	SampType: **MBLK**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **41178**
Client ID: **PBW**	Batch ID: **18224**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **7/21/2021**	SeqNo: **531208**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.300									
Toluene	ND	1.00									
Surr: 1,2-Dichloroethane-d4	110		100.0		110	75.3	126				
Surr: 4-Bromofluorobenzene	101		100.0		101	78.1	120				
Surr: Dibromofluoromethane	93.1		100.0		93.1	74.2	122				
Surr: Toluene-d8	98.2		100.0		98.2	76.2	135				

Sample ID: **LCS MSVWS-3043**	SampType: **LCS**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **41178**
Client ID: **LCSW**	Batch ID: **18224**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **7/21/2021**	SeqNo: **531210**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	34.0	0.300	40.00	0	84.9	76.8	125				
Toluene	41.0	1.00	40.00	0	103	82	122				

Qualifiers: H Holding times for preparation or analysis exceeded S Spike Recovery outside accepted recovery limits

QC SUMMARY REPORT

Specialty Analytical

WO#: **2107129**

8/5/2021

Client: RSEC Environmental Inc.

Project: EKC/ EKC-0721 **TestCode:** **8260_W**

Sample ID: **LCS MSVWS-3043**	SampType: **LCS**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **41178**
Client ID: **LCSW**	Batch ID: **18224**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **7/21/2021**	SeqNo: **531210**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID: **2107141-001EMS**	SampType: **MS**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **41178**
Client ID: **BatchQC**	Batch ID: **18224**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **7/22/2021**	SeqNo: **531212**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	47.2	0.300	40.00	0	118	74.1	136				
Toluene	39.9	1.00	40.00	1.770	95.4	68.4	135				

Qualifiers: H Holding times for preparation or analysis exceeded S Spike Recovery outside accepted recovery limits

QC SUMMARY REPORT

Specialty Analytical

WO#: **2107129**

8/5/2021

Client: RSEC Environmental Inc.

Project: EKC/ EKC-0721 **TestCode:** **BTEXRBC_W**

Sample ID: **CCV-R41145** SampType: **CCV** TestCode: **BTEXRBC_W** Units: **µg/L** Prep Date: RunNo: **41145**

Client ID: **CCV** Batch ID: **18234** TestNo: **SW8021B** **SW 5030B** Analysis Date: **7/19/2021** SeqNo: **529026**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	45.3	0.300	50.00	0	90.6	85	115				
Toluene	53.9	0.500	50.00	0	108	85	115				

Sample ID: **LCS-R41145** SampType: **LCS** TestCode: **BTEXRBC_W** Units: **µg/L** Prep Date: RunNo: **41145**

Client ID: **LCSW** Batch ID: **18234** TestNo: **SW8021B** **SW 5030B** Analysis Date: **7/19/2021** SeqNo: **529027**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	45.3	0.300	50.00	0	90.6	85	115				
Toluene	53.9	0.500	50.00	0	108	85	115				

Sample ID: **MB-R41145** SampType: **MBLK** TestCode: **BTEXRBC_W** Units: **µg/L** Prep Date: RunNo: **41145**

Client ID: **PBW** Batch ID: **18234** TestNo: **SW8021B** **SW 5030B** Analysis Date: **7/19/2021** SeqNo: **529028**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.300									
Toluene	ND	0.500									
Surr: 4-Bromofluorobenzene	108		100.0		108	74.8	126				

Qualifiers: H Holding times for preparation or analysis exceeded S Spike Recovery outside accepted recovery limits

QC SUMMARY REPORT

Specialty Analytical

WO#: **2107129**

8/5/2021

Client: RSEC Environmental Inc.

Project: EKC/ EKC-0721 **TestCode:** **BTEXRBC_W**

Sample ID: **CCV-R41145** SampType: **CCV** TestCode: **BTEXRBC_W** Units: **µg/L** Prep Date: RunNo: **41145**

Client ID: **CCV** Batch ID: **18234** TestNo: **SW8021B** **SW 5030B** Analysis Date: **7/20/2021** SeqNo: **529185**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	45.8	0.300	50.00	0	91.6	85	115				
Toluene	54.6	0.500	50.00	0	109	85	115				

Sample ID: **CCB-R41145** SampType: **CCB** TestCode: **BTEXRBC_W** Units: **µg/L** Prep Date: RunNo: **41145**

Client ID: **CCB** Batch ID: **18234** TestNo: **SW8021B** **SW 5030B** Analysis Date: **7/20/2021** SeqNo: **529186**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.300									
Toluene	ND	0.500									
Surr: 4-Bromofluorobenzene	109		100.0		109	74.8	126				

Sample ID: **2107129-010AMS** SampType: **MS** TestCode: **BTEXRBC_W** Units: **µg/L** Prep Date: RunNo: **41145**

Client ID: **ISRW-10** Batch ID: **18234** TestNo: **SW8021B** **SW 5030B** Analysis Date: **7/20/2021** SeqNo: **529190**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	45100	300	50000	110.0	90.0	67.8	118				
Toluene	117000	500	50000	61600	111	74.7	117				

Qualifiers: H Holding times for preparation or analysis exceeded S Spike Recovery outside accepted recovery limits

QC SUMMARY REPORT

Specialty Analytical

WO#: **2107129**

8/5/2021

Client: RSEC Environmental Inc.

Project: EKC/ EKC-0721 **TestCode:** **BTEXRBC_W**

Sample ID: **CCV-R41145**	SampType: **CCV**	TestCode: **BTEXRBC_W**	Units: **µg/L**	Prep Date:	RunNo: **41145**
Client ID: **CCV**	Batch ID: **18234**	TestNo: **SW8021B**	**SW 5030B**	Analysis Date: **7/21/2021**	SeqNo: **529289**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	46.7	0.300	50.00	0	93.4	85	115				

Sample ID: **CCB-R41145**	SampType: **CCB**	TestCode: **BTEXRBC_W**	Units: **µg/L**	Prep Date:	RunNo: **41145**
Client ID: **CCB**	Batch ID: **18234**	TestNo: **SW8021B**	**SW 5030B**	Analysis Date: **7/21/2021**	SeqNo: **529290**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.300									
Surr: 4-Bromofluorobenzene	108		100.0		108	74.8	126				

Qualifiers: H Holding times for preparation or analysis exceeded S Spike Recovery outside accepted recovery limits

Specialty Analytical
9011 SE Jannsen Rd
Clackamas, Oregon 97015
TEL: 503-607-1331 FAX: 503-607-1336
Website: www.specialtyanalytical.com

Sample Receipt Checklist

Client Name RSEC Work Order Number 2107129

RcptNo: 1 Date and Time Received 7/16/2021 3:28:51 PM Received by: Marty French

Completed by Reviewed by:

Completed Date: 7/16/2021 Reviewed Date:

Carrier name: Client

Chain of custody present?	Yes	☑	No	☐		
Chain of custody signed when relinquished and received?	Yes	☑	No	☐		
Chain of custody agrees with sample labels?	Yes	☑	No	☐	Not Present	☐
Are matrices correctly identified on Chain of custody?	Yes	☑	No	☐		
Is it clear what analyses were requested?	Yes	☑	No	☐		
Custody seals intact on sample bottles?	Yes	☐	No	☐	Not Present	☑
Samples in proper container/bottle?	Yes	☑	No	☐		
Were correct preservatives used and noted?	Yes	☑	No	☐	NA	☐
Sample containers intact?	Yes	☑	No	☐		
Sufficient sample volume for indicated test?	Yes	☑	No	☐		
Were container lables complete (ID, Pres, Date)?	Yes	☑	No	☐		
All samples received within holding time?	Yes	☑	No	☐		
Was an attempt made to cool the samples?	Yes	☑	No	☐	NA	☐
All samples received at a temp. of > 0° C to 6.0° C?	Yes	☑	No	☐	NA	☐
Response when temperature is outside of range:						
Preservative added to bottles:						
Sample Temp. taken and recorded upon receipt?	Yes	☑	No	☐	To	5.6 ºC
Water - Were bubbles absent in VOC vials?	Yes	☑	No	☐	No Vials	☐
Water - Was there Chlorine Present?	Yes	☐	No	☐	NA	☑
Water - pH acceptable upon receipt?	Yes	☑	No	☐	NA	☐
Are Samples considered acceptable?	Yes	☑	No	☐		
Custody Seals present?	Yes	☐	No	☑		
Traffic Report or Packing Lists present?	Yes	☐	No	☑		
Airbill or Sticker?	Air Bill	☐	Sticker	☐	Not Present	☑
Airbill No:						
Sample Tags Present?	Yes	☐	No	☑		
Sample Tags Listed on COC?	Yes	☐	No	☑		
Tag Numbers:						
Sample Condition?	Intact	☑	Broken	☐	Leaking	☐

Case Number: SDG: SAS:

Adjusted? _____ Checked by

Any No and/or NA (not applicable) response must be detailed in the comments section be

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Sample Receipt Checklist

Client Contacted? ☐ Yes ☑ No ☐ NA Person Contacted: Comments:

Contact Mode: ☐ Phone: ☐ Fax: ☐ Email: ☐ In Person:

Client Instructions:

Date Contacted: Contacted By:

Regarding:

CorrectiveAction:

Specialty Analytical
9011 SE Jannsen Rd
Clackamas, OR 97015
Phone: 503-607-1331
Fax: 503-607-1336

Chain of Custody Record

2107129

Date: 7/16/21 Page: 1 of: 2

Laboratory Project No (internal): mw 7/16

Project Name: EKC

Temperature on Receipt: ~~3.4~~ °C 5.6°C

Project No: EKC-0721 PO No: EKC-0721

Cooling: ice Shipped Via: client

Collected by: P. Truax

Custody Seal: Y / N Intact / Broken Cooler / Bottle

State Collected: OR (WA) OTHER

MDL TIER IV EDD

Report To (PM):

Sample Disposal: ☐ Return to client ☒ Disposal by lab (after 60 days)

Client: RSEC Environmental

Address: 958 Hood View Ct.

City, State, Zip: Hood River OR, 97031

Telephone: 541-490-4223

AP Email:

PM Email: richard@rsecinc.com

Sample Name	Sample Date	Sample Time	Sample Matrix*	# of Containers	Requested Tests: 8021 Benzene + Toluene	Comments
1 ISRW-1	7/14/21	0900	GW	3	X	
2 ISRW-26		0910				
3 ISRW-3		0920				
4 ISRW-4		0940				
5 ISRW-5		0930				~~IS~~ + some others
6 ISRW-6		0950				Sediment/Mossy
7 ISRW-7		1010				
8 ISRW-8		1000				
9 ISRW-9		1020				
10 ISRW-10		1030				

*Matrix: A = Air, AQ = Aqueous, L=Liquid, O = Oil, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water, M = Miscellaneous

Turn-around Time: Standard (5-7 Business): X 3 Day: ____ 2 Day: ____ Next Day: ____ Same Day: ____

Expedited turn-around requests should be coordinated in advance

Relinquished	Date/Time	Received	Date/Time
x	7/16/21 1520	x	7/16/21 1520
x		x	
x		x	

Chain of Custody Record

Specialty Analytical
9011 SE Jannsen Rd
Clackamas, OR 97015
Phone: 503-607-1331
Fax: 503-607-1336

Date: 7/16/21 Page: 2 of: 2

Project Name: EKC

Project No: EKC-0721 PO No: EKC-0721

Collected by: R. Tivax

State Collected: OR (WA) OTHER

Report To (PM):

PM Email: richa@rsecinc.com

Laboratory Project No (internal): 2107129

Temperature on Receipt: 5.6 °C

Cooling: Ice Shipped Via: CLIENT

Custody Seal: Y / N Intact / Broken Cooler / Bottle

MDL TIER IV EDD

Sample Disposal: ☐ Return to client ☒ Disposal by lab (after 60 days)

Client: RSEC Environmental

Address: 958 Hood View Ct

City, State, Zip: Hood River OR 97031

Telephone: 541-490-4223

AP Email:

Sample Name	Sample Date	Sample Time	Sample Matrix*	# of Containers	Requested Tests: 8260 Benzene + Toluene	Comments
1 NIA-E. Sump	7/16/21	1100	GW	3	X	
2						
3						
4						
5						
6						
7						
8						
9						
10						

*Matrix: A = Air, AQ = Aqueous, L=Liquid, O = Oil, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water, M = Miscellaneous

Turn-around Time: Standard (5-7 Business): X 3 Day: _____ 2 Day: _____ Next Day: _____ Same Day: _____

Expedited turn-around requests should be coordinated in advance

Relinquished	Date/Time	Received	Date/Time
x	7/16/21 1520	x	7/16/21 1520
x		x	
x		x	

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Website: www.specialtyanalytical.com

Definition Only

WO#: **2107129**
Date: **8/5/2021**

Definitions:

KEY TO FLAGS

A: This sample contains a Gasoline Range Organic not identified as a specific hydrocarbon product. The result was qualified against gasoline calibration standards.

A1: This sample contains a Diesel Range Organic not identified as a specific hydrocarbon product. The result was qualified against diesel calibration standards.

A2: This sample contains a Lube Oil Range Organic not identified as a specific hydrocarbon product. The result was qualified against lube oil calibration standards.

A3: The results was determined to be Non-Detect based on hydrocarbon pattern recognition. The product was carry-over from another hydrocarbon type.

A4: The product appears to be aged or degraded.

B: The blank exhibited a positive result greater than the reporting limit for this compound.

CN: See Case Narrative.

E: Result exceeds the calibration range for this compound. The result should be considered an estimate.

F: The positive result for this hydrocarbon is due to single component contamination. The product does not match any hydrocarbon in the fuels library.

FS: Follow-up testing is suggested.

G: Result may be biased high due to biogenic interferences. Clean up is recommended.

H: Sample was analyzed outside recommended holding time.

HT: At client's request, samples was analyzed outside of recommended holding time.

HP: Sample was analyzed outside recommended holding time due to VOA having pH >2.

J: The results for this analyte is between the MDL and the PQL and should be considered an

Definitions:

estimated concentration.

K: Diesel result is biased high due to amount of Oil contained in the sample.

L: Diesel result is biased high due to amount of Gasoline contained in the sample.

M: Oil result is biased high due to amount of Diesel contained in the sample.

N: Gasoline result is biased high due to amount of Diesel contained in the sample.

MC: Sample concentration is greater than 4x the spiked value, the spiked value is considered insignificant.

MI: Result is outside control limits due to matrix interference.

NH: Sample matrix is non-homogeneous

MSA: Value determined by Method of Standard Addition.

O: Laboratory Control Standard (LCS) exceeded laboratory control limits but meets CCV criteria. Data meets EPA requirements.

Q: Detection levels elevated due to sample matrix.

R: RPD control limits were exceeded

RF: Duplicate failed due to result being at or near the method-reporting limit.

RP: Matrix spike values exceed established QC limits; post digestion spike is in control.

S: Recovery is outside control limits.

SC: CCV or LCS exceeded high recovery control limits, but associated samples are non-detect. Data meets EPA requirements.

SL: LCS exceeded recovery control limits, but associated MS/MSD passing. Data meets EPA requirements.

July 31, 2021 Service Request No:K2108290

Rich Truax
RSEC Environmental & Engineering Consulting, Inc.
958 Hood View Ct., Ste 101
Hood River, OR 97031

Laboratory Results for: Emerald Kalama Chem

Dear Rich,

Enclosed are the results of the sample(s) submitted to our laboratory July 16, 2021
For your reference, these analyses have been assigned our service request number **K2108290.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3364. You may also contact me via email at howard.holmes@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Howard Holmes
Project Manager

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626
PHONE +1 360 577 7222 | FAX +1 360 636 1068
ALS Group USA, Corp.
dba ALS Environmental

ALS Environmental

Client: RSEC Environmental & Engineering Consulting, Inc. / ESB / WBE / DBE
Service Request: K2108290
Project: Emerald Kalama Chem
Date Received: 07/16/2021
Sample Matrix: Water

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

Sample Receipt:

Five water samples were received for analysis at ALS Environmental on 07/16/2021. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Volatiles by GC/MS:

Method 8260C, 07/21/2021: The recovery of Toluene in the Matrix Spike (MS) KQ2114405-06 is elevated due to carry over from a high level field sample analyzed directly before the MS. The replicate Laboratory Control Samples (LCS/DLCS) KQ2114405-03 and KQ2114405-04 recoveries are acceptable indicating the batch was in control. The matrix spike recovery of Toluene was flagged to indicate the outlier. No further corrective action was taken.

Method 8260C, 07/21/2021: Samples required dilution due to the presence of elevated levels of target analyte. The reporting limits are adjusted to reflect the dilution.

Approved by _____ Date 07/31/2021

SAMPLE DETECTION SUMMARY

CLIENT ID: ISRW-1			Lab ID: K2108290-001			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Benzene	34			25	ug/L	8260C
Toluene	26000			500	ug/L	8260C

CLIENT ID: ISRW-5			Lab ID: K2108290-002			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Benzene	31			25	ug/L	8260C
Toluene	38000			500	ug/L	8260C

CLIENT ID: ISRW-8			Lab ID: K2108290-003			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Benzene	70			25	ug/L	8260C
Toluene	52000			500	ug/L	8260C

CLIENT ID: ISRW-10			Lab ID: K2108290-004			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Benzene	150			25	ug/L	8260C
Toluene	74000			500	ug/L	8260C

CLIENT ID: NIA-ES			Lab ID: K2108290-005			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Benzene	2.0			0.50	ug/L	8260C

CHAIN OF CUSTODY

KZ108290

1317 South 13th Ave., Kelso, WA 98626 | +1 360 577 7222 | +1 800 695 7222 | +1 360 636 1068 (fax)

SR# _____ PAGE 1 OF 1 COC# 1

PROJECT NAME: Emerald Kalama Chem
PROJECT NUMBER: EKC-0721
PROJECT MANAGER: Rich Trox
COMPANY NAME: RSEC Environmental
ADDRESS: 958 Hood View Ct.
CITY/STATE/ZIP: Hood River, OR 97031
E-MAIL ADDRESS: richa@rsecinc.com
PHONE #: 541.490.4223 FAX #:
SAMPLER'S SIGNATURE:

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Semivolatile Organics by GC/MS 625☐ 8270☐ 8270LL☐ SIM PAH☐	Volatile Organics 624☐ 8260☒ 8021☐ BTEX☐	Hydrocarbons (*see below) Gas☐ Diesel☐ Oil☐	Oil & Grease/TRPH 1664 HEM☐ 1664 SGT☐	PCBs Aroclors☐ Congeners☐	Pesticides/Herbicides 608☐ 8081☐ 8141☐ 8151☐	Chlorophenolics - 8151M Tri☐ Tetra☐ PCP☐	Metals, Total or Dissolved (See List below)	Cyanide☐ Hex-Chrom☐	(circle) pH, Cond., Cl, SO4, PO4, F, NO2, NO3, BOD, TSS, TDS, Turb.	(circle) NH3-N, COD, TKN, TOC, DOC, NO2+NO3, T-Phos	TOX 9020☐ AOX 1650☐ 506☐	Alkalinity ☐ CO3☐ HCO3☐	Dioxins/Furans 1613☐ 8290☐	Dissolved Gases CO2☐ Ethane☐ Ethene☐ RSK 175☐ Methane☐ Ethane☐ Ethene☐	REMARKS
ISRW-1	7/16/21	0900		GW	3		X														Benzene
ISRW-5		0930																			+ Toluene
ISRW-8		1000																			ONLY
ISRW-10		1030																			
NIA-ES		1100																			#9 Sediment
																					Mesh

REPORT REQUIREMENTS

- X I. Routine Report: Method Blank, Surrogate, as required
- ___ II. Report Dup., MS, MSD as required
- ___ III. CLP Like Summary (no raw data)
- ___ IV. Data Validation Report
- ___ V. EDD

INVOICE INFORMATION

P.O. # EKC-0721
Bill To: RSEC
richa@rsecinc.com

TURNAROUND REQUIREMENTS

___ 24 hr. ___ 48 hr.
___ 5 day
X Standard (15 working days)
___ Provide FAX Results

Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER: _____ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:

All 8260 Benzene + Toluene Only. ISRW's may have elevated concentrations, Not NIA Sample.

Container Supply Number: 118175

☐ Sample Shipment contains USDA regulated soil samples (check box if applicable)

RELINQUISHED BY:		RECEIVED BY:		RELINQUISHED BY:		RECEIVED BY:	
Signature	Date/Time 7/16	Signature	Date/Time 7/16/21 1300	Signature	Date/Time	Signature	Date/Time
Printed Name Rich Trox	Firm RSEC	Printed Name Jessie Purdue	Firm ALS	Printed Name	Firm	Printed Name	Firm

PM HZ

Cooler Receipt and Preservation Form

Client RSec Environmental Service Request K21 1052901

Received: 7/16/21 Opened: 7/16/21 By: SP Unloaded: 7/16/21 By: SP

. Samples were received via? *USPS* *Fed Ex* *UPS* *DHL* *PDX* *Courier* *Hand Delivered*

. Samples were received in: (circle) *Cooler* *Box* *Envelope* *Other* _____ *NA*

. Were custody seals on coolers? NA (Y) N If yes, how many and where? 1 Front

If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

. Was a Temperature Blank present in cooler? NA (Y) N If yes, notate the temperature in the appropriate column below:

If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":

. Were samples received within the method specified temperature ranges? NA Y (N)

If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA (Y) N

f applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number (NA)	Filed
9.6		IR02					

. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* _____

Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N

Were samples received in good condition (unbroken) NA (Y) N

Were all sample labels complete (ie, analysis, preservation, etc.)? NA (Y) N

). Did all sample labels and tags agree with custody papers? NA (Y) N

1. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N

2. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* (NA) Y N

3. Were VOA vials received without headspace? *Indicate in the table below.* NA (Y) N

4. Was C12/Res negative? (NA) Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

SHORT HOLD TIME

lotes, Discrepancies, Resolutions: _____

Analytical Report

Client:	RSEC Environmental & Engineering Consulting, Inc. / ESB /	**Service Request:**	K2108290
Project:	Emerald Kalama Chem/EKC-0721	**Date Collected:**	07/16/21 09:00
Sample Matrix:	Water	**Date Received:**	07/16/21 13:00
Sample Name:	ISRW-1	**Units:**	ug/L
Lab Code:	K2108290-001	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	**34**	25	50	07/21/21 19:11	
Toluene	**26000**	500	1000	07/21/21 16:59	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	84	68 - 117	07/21/21 19:11	
Dibromofluoromethane	99	73 - 122	07/21/21 19:11	
Toluene-d8	102	65 - 144	07/21/21 19:11	

Analytical Report

Client:	RSEC Environmental & Engineering Consulting, Inc. / ESB /	**Service Request:**	K2108290
Project:	Emerald Kalama Chem/EKC-0721	**Date Collected:**	07/16/21 09:30
Sample Matrix:	Water	**Date Received:**	07/16/21 13:00
Sample Name:	ISRW-5	**Units:**	ug/L
Lab Code:	K2108290-002	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	**31**	25	50	07/21/21 19:38	
Toluene	**38000**	500	1000	07/21/21 17:25	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	84	68 - 117	07/21/21 19:38	
Dibromofluoromethane	105	73 - 122	07/21/21 19:38	
Toluene-d8	100	65 - 144	07/21/21 19:38	

Analytical Report

Client:	RSEC Environmental & Engineering Consulting, Inc. / ESB /	**Service Request:**	K2108290
Project:	Emerald Kalama Chem/EKC-0721	**Date Collected:**	07/16/21 10:00
Sample Matrix:	Water	**Date Received:**	07/16/21 13:00
Sample Name:	ISRW-8	**Units:**	ug/L
Lab Code:	K2108290-003	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	**70**	25	50	07/21/21 20:04	
Toluene	**52000**	500	1000	07/21/21 17:52	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	86	68 - 117	07/21/21 20:04	
Dibromofluoromethane	102	73 - 122	07/21/21 20:04	
Toluene-d8	99	65 - 144	07/21/21 20:04	

Analytical Report

Client:	RSEC Environmental & Engineering Consulting, Inc. / ESB /	**Service Request:**	K2108290
Project:	Emerald Kalama Chem/EKC-0721	**Date Collected:**	07/16/21 10:30
Sample Matrix:	Water	**Date Received:**	07/16/21 13:00
Sample Name:	ISRW-10	**Units:**	ug/L
Lab Code:	K2108290-004	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	**150**	25	50	07/21/21 20:31	
Toluene	**74000**	500	1000	07/21/21 18:18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	84	68 - 117	07/21/21 20:31	
Dibromofluoromethane	102	73 - 122	07/21/21 20:31	
Toluene-d8	99	65 - 144	07/21/21 20:31	

Analytical Report

Client:	RSEC Environmental & Engineering Consulting, Inc. / ESB /	**Service Request:**	K2108290
Project:	Emerald Kalama Chem/EKC-0721	**Date Collected:**	07/16/21 11:00
Sample Matrix:	Water	**Date Received:**	07/16/21 13:00
Sample Name:	NIA-ES	**Units:**	ug/L
Lab Code:	K2108290-005	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	**2.0**	0.50	1	07/21/21 18:45	
Toluene	ND U	0.50	1	07/21/21 18:45	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	84	68 - 117	07/21/21 18:45	
Dibromofluoromethane	106	73 - 122	07/21/21 18:45	
Toluene-d8	101	65 - 144	07/21/21 18:45	

Client: RSEC Environmental & Engineering Consulting, Inc. / ESB / **Service Request:** K2108290
Project: Emerald Kalama Chem/EKC-0721
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY
Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Extraction Method: None

Sample Name	Lab Code	4-Bromofluorobenzene 68-117	Dibromofluoromethane 73-122	Toluene-d8 65-144
ISRW-1	K2108290-001	84	99	102
ISRW-5	K2108290-002	84	105	100
ISRW-8	K2108290-003	86	102	99
ISRW-10	K2108290-004	84	102	99
NIA-ES	K2108290-005	84	106	101
Method Blank	KQ2114405-05	86	100	101
Lab Control Sample	KQ2114405-03	94	101	105
Duplicate Lab Control Sample	KQ2114405-04	95	105	103
NIA-ES	KQ2114405-06	91	102	102
NIA-ES	KQ2114405-07	92	105	105

Client:	RSEC Environmental & Engineering Consulting, Inc. / ESB / WBE / DBE	**Service Request:**	K2108290
Project:	Emerald Kalama Chem/EKC-0721	**Date Collected:**	07/16/21
Sample Matrix:	Water	**Date Received:**	07/16/21
		Date Analyzed:	07/21/21
		Date Extracted:	NA

Duplicate Matrix Spike Summary
Volatile Organic Compounds by GC/MS

Sample Name:	NIA-ES	**Units:**	ug/L
Lab Code:	K2108290-005	**Basis:**	NA
Analysis Method:	8260C		
Prep Method:	None		

		Matrix Spike			Duplicate Matrix Spike					
		KQ2114405-06			KQ2114405-07					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Benzene	2.0	12.6	10.0	107	12.0	10.0	101	63-144	5	30
Toluene	ND U	16.3	10.0	163 *	10.8	10.0	108	71-136	41*	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

Analytical Report

Client:	RSEC Environmental & Engineering Consulting, Inc. / ESB /	**Service Request:**	K2108290
Project:	Emerald Kalama Chem/EKC-0721	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KQ2114405-05	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	ND U	0.50	1	07/21/21 14:47	
Toluene	ND U	0.50	1	07/21/21 14:47	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	86	68 - 117	07/21/21 14:47	
Dibromofluoromethane	100	73 - 122	07/21/21 14:47	
Toluene-d8	101	65 - 144	07/21/21 14:47	

Client:	RSEC Environmental & Engineering Consulting, Inc. / ESB / WBE / DBE	**Service Request:**	K2108290
Project:	Emerald Kalama Chem/EKC-0721	**Date Analyzed:**	07/21/21
Sample Matrix:	Water	**Date Extracted:**	NA

Duplicate Lab Control Sample Summary
Volatile Organic Compounds by GC/MS

Analysis Method:	8260C	**Units:**	ug/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	731965

	Lab Control Sample KQ2114405-03			Duplicate Lab Control Sample KQ2114405-04					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Benzene	9.56	10.0	96	9.45	10.0	95	69-124	1	30
Toluene	9.47	10.0	95	9.49	10.0	95	69-124	<1	30

October 2021 Semi-Annual Data Set Laboratory Reports

Specialty Analytical (Revised Report Due to Missing Requested Analytes)

Specialty Analytical

9011 SE Jannsen Rd
Clackamas, OR 97015
TEL: (503) 607-1331
Website: www.specialtyanalytical.com

December 03, 2021

Rich Truax
RSEC Environmental Inc.
958 Hood View Ct.
Hood River, OR 97031
TEL: (541) 490-4223
FAX

RE: EKC-1021 Order No.: 2110025

Dear Rich Truax:

REVISED REPORT: Please see case narrative for information on revision.

There were no problems with the analysis and all data for associated QC met EPA or laboratory specifications, except where noted in the Case Narrative, or as qualified with flags. Results apply only to the samples analyzed. Without approval of the laboratory, the reproduction of this report is only permitted in its entirety.

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

Sincerely,

Marty French
Lab Director

CLIENT: RSEC Environmental Inc.
Project: EKC-1021

Lab ID: 2110025-001 **Matrix:** GROUNDWATER
Client Sample ID ISRW-1 **Collection Date:** 10/1/2021 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS				**SW8260D**	**SW 5030B**	Analyst: **TB**
Benzene	ND	300	Q	µg/L	1000	10/14/2021 5:12:00 PM
Toluene	1720	1000		µg/L	1000	10/14/2021 5:12:00 PM
Surr: 1,2-Dichloroethane-d4	127	75.3 - 126	SMI	%Rec	1000	10/14/2021 5:12:00 PM
Surr: 4-Bromofluorobenzene	98.2	78.1 - 120		%Rec	1000	10/14/2021 5:12:00 PM
Surr: Dibromofluoromethane	130	74.2 - 122	SMI	%Rec	1000	10/14/2021 5:12:00 PM
Surr: Toluene-d8	102	76.2 - 135		%Rec	1000	10/14/2021 5:12:00 PM

Lab ID: 2110025-002 **Matrix:** GROUNDWATER
Client Sample ID ISRW-2b **Collection Date:** 10/1/2021 9:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS				**SW8260D**	**SW 5030B**	Analyst: **TB**
Benzene	96.0	30.0		µg/L	100	10/15/2021 1:37:00 PM
Toluene	17000	1000		µg/L	1000	10/14/2021 5:34:00 PM
Surr: 1,2-Dichloroethane-d4	128	75.3 - 126	SMI	%Rec	1000	10/14/2021 5:34:00 PM
Surr: 4-Bromofluorobenzene	98.4	78.1 - 120		%Rec	1000	10/14/2021 5:34:00 PM
Surr: Dibromofluoromethane	130	74.2 - 122	SMI	%Rec	1000	10/14/2021 5:34:00 PM
Surr: Toluene-d8	101	76.2 - 135		%Rec	1000	10/14/2021 5:34:00 PM

Lab ID: 2110025-003 **Matrix:** GROUNDWATER
Client Sample ID ISRW-3 **Collection Date:** 10/1/2021 9:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS				**SW8260D**	**SW 5030B**	Analyst: **TB**
Benzene	58.0	30.0		µg/L	100	10/15/2021 1:59:00 PM
Toluene	17800	1000		µg/L	1000	10/14/2021 5:56:00 PM
Surr: 1,2-Dichloroethane-d4	128	75.3 - 126	SMI	%Rec	1000	10/14/2021 5:56:00 PM
Surr: 4-Bromofluorobenzene	97.4	78.1 - 120		%Rec	1000	10/14/2021 5:56:00 PM
Surr: Dibromofluoromethane	130	74.2 - 122	SMI	%Rec	1000	10/14/2021 5:56:00 PM
Surr: Toluene-d8	101	76.2 - 135		%Rec	1000	10/14/2021 5:56:00 PM

CLIENT: RSEC Environmental Inc.
Project: EKC-1021

Lab ID: 2110025-004 **Matrix:** GROUNDWATER
Client Sample ID ISRW-4 **Collection Date:** 10/1/2021 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS				**SW8260D**	**SW 5030B**	Analyst: **TB**
Benzene	7.30	0.300		µg/L	1	10/15/2021 2:21:00 PM
Toluene	78.8	1.00		µg/L	1	10/15/2021 2:21:00 PM
Surr: 1,2-Dichloroethane-d4	100	75.3 - 126		%Rec	1	10/15/2021 2:21:00 PM
Surr: 4-Bromofluorobenzene	98.0	78.1 - 120		%Rec	1	10/15/2021 2:21:00 PM
Surr: Dibromofluoromethane	99.4	74.2 - 122		%Rec	1	10/15/2021 2:21:00 PM
Surr: Toluene-d8	98.2	76.2 - 135		%Rec	1	10/15/2021 2:21:00 PM

Lab ID: 2110025-005 **Matrix:** GROUNDWATER
Client Sample ID ISRW-5 **Collection Date:** 10/1/2021 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS				**SW8260D**	**SW 5030B**	Analyst: **TB**
Benzene	ND	30.0		µg/L	100	10/15/2021 2:44:00 PM
Toluene	21300	1000		µg/L	1000	10/14/2021 6:41:00 PM
Surr: 1,2-Dichloroethane-d4	105	75.3 - 126		%Rec	1000	10/14/2021 6:41:00 PM
Surr: 4-Bromofluorobenzene	98.6	78.1 - 120		%Rec	1000	10/14/2021 6:41:00 PM
Surr: Dibromofluoromethane	104	74.2 - 122		%Rec	1000	10/14/2021 6:41:00 PM
Surr: Toluene-d8	101	76.2 - 135		%Rec	1000	10/14/2021 6:41:00 PM

Lab ID: 2110025-006 **Matrix:** GROUNDWATER
Client Sample ID ISRW-6 **Collection Date:** 10/1/2021 9:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS				**SW8260D**	**SW 5030B**	Analyst: **TB**
Benzene	54.0	30.0		µg/L	100	10/14/2021 7:03:00 PM
Toluene	7520	100		µg/L	100	10/14/2021 7:03:00 PM
Surr: 1,2-Dichloroethane-d4	106	75.3 - 126		%Rec	100	10/14/2021 7:03:00 PM
Surr: 4-Bromofluorobenzene	99.4	78.1 - 120		%Rec	100	10/14/2021 7:03:00 PM
Surr: Dibromofluoromethane	105	74.2 - 122		%Rec	100	10/14/2021 7:03:00 PM
Surr: Toluene-d8	100	76.2 - 135		%Rec	100	10/14/2021 7:03:00 PM

CLIENT: RSEC Environmental Inc.
Project: EKC-1021

Lab ID: 2110025-007 **Matrix:** GROUNDWATER
Client Sample ID ISRW-7 **Collection Date:** 10/1/2021 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS				**SW8260D**	**SW 5030B**	Analyst: **TB**
Benzene	ND	0.300		µg/L	1	10/14/2021 3:21:00 PM
Toluene	ND	1.00		µg/L	1	10/14/2021 3:21:00 PM
Surr: 1,2-Dichloroethane-d4	98.6	75.3 - 126		%Rec	1	10/14/2021 3:21:00 PM
Surr: 4-Bromofluorobenzene	97.4	78.1 - 120		%Rec	1	10/14/2021 3:21:00 PM
Surr: Dibromofluoromethane	99.4	74.2 - 122		%Rec	1	10/14/2021 3:21:00 PM
Surr: Toluene-d8	99.5	76.2 - 135		%Rec	1	10/14/2021 3:21:00 PM

Lab ID: 2110025-008 **Matrix:** GROUNDWATER
Client Sample ID ISRW-8 **Collection Date:** 10/1/2021 10:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS				**SW8260D**	**SW 5030B**	Analyst: **TB**
Benzene	60.0	30.0		µg/L	100	10/15/2021 3:06:00 PM
Toluene	17000	1000		µg/L	1000	10/14/2021 7:25:00 PM
Surr: 1,2-Dichloroethane-d4	131	75.3 - 126	SMI	%Rec	1000	10/14/2021 7:25:00 PM
Surr: 4-Bromofluorobenzene	98.5	78.1 - 120		%Rec	1000	10/14/2021 7:25:00 PM
Surr: Dibromofluoromethane	130	74.2 - 122	SMI	%Rec	1000	10/14/2021 7:25:00 PM
Surr: Toluene-d8	100	76.2 - 135		%Rec	1000	10/14/2021 7:25:00 PM

Lab ID: 2110025-009 **Matrix:** GROUNDWATER
Client Sample ID ISRW-9 **Collection Date:** 10/1/2021 10:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS				**SW8260D**	**SW 5030B**	Analyst: **TB**
Benzene	ND	15.0		µg/L	50	10/15/2021 3:29:00 PM
Toluene	4360	1000		µg/L	1000	10/14/2021 7:47:00 PM
Surr: 1,2-Dichloroethane-d4	130	75.3 - 126	SMI	%Rec	1000	10/14/2021 7:47:00 PM
Surr: 4-Bromofluorobenzene	96.9	78.1 - 120		%Rec	1000	10/14/2021 7:47:00 PM
Surr: Dibromofluoromethane	131	74.2 - 122	SMI	%Rec	1000	10/14/2021 7:47:00 PM
Surr: Toluene-d8	102	76.2 - 135		%Rec	1000	10/14/2021 7:47:00 PM

CLIENT: RSEC Environmental Inc.
Project: EKC-1021

Lab ID: 2110025-010 **Matrix:** GROUNDWATER
Client Sample ID ISRW-10 **Collection Date:** 10/1/2021 10:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS				**SW8260D**	**SW 5030B**	Analyst: **TB**
Benzene	127	30.0		µg/L	100	10/15/2021 3:51:00 PM
Toluene	35900	1000		µg/L	1000	10/14/2021 8:09:00 PM
Surr: 1,2-Dichloroethane-d4	127	75.3 - 126	SMI	%Rec	1000	10/14/2021 8:09:00 PM
Surr: 4-Bromofluorobenzene	98.2	78.1 - 120		%Rec	1000	10/14/2021 8:09:00 PM
Surr: Dibromofluoromethane	129	74.2 - 122	SMI	%Rec	1000	10/14/2021 8:09:00 PM
Surr: Toluene-d8	103	76.2 - 135		%Rec	1000	10/14/2021 8:09:00 PM

Lab ID: 2110025-011 **Matrix:** GROUNDWATER
Client Sample ID ISRW-11 **Collection Date:** 10/1/2021 10:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS				**SW8260D**	**SW 5030B**	Analyst: **TB**
Benzene	6.80	6.00		µg/L	20	10/15/2021 4:13:00 PM
Toluene	1870	1000		µg/L	1000	10/14/2021 8:31:00 PM
Surr: 1,2-Dichloroethane-d4	128	75.3 - 126	SMI	%Rec	1000	10/14/2021 8:31:00 PM
Surr: 4-Bromofluorobenzene	97.5	78.1 - 120		%Rec	1000	10/14/2021 8:31:00 PM
Surr: Dibromofluoromethane	130	74.2 - 122	SMI	%Rec	1000	10/14/2021 8:31:00 PM
Surr: Toluene-d8	103	76.2 - 135		%Rec	1000	10/14/2021 8:31:00 PM

CLIENT: RSEC Environmental Inc.
Project: EKC-1021

Lab ID: 2110025-012 **Matrix:** GROUNDWATER
Client Sample ID E-Sump **Collection Date:** 10/1/2021 11:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
SEMIVOLATILE ORGANICS-LOW LEVEL				**SW8270E**	**SW 3510C**	Analyst: **mjf**
Biphenyl	ND	0.473	H	µg/L	1	11/10/2021 1:16:00 PM
Diphenyl ether	104	0.473	H	µg/L	1	11/10/2021 1:16:00 PM
Surr: 2,4,6-Tribromophenol	74.2	33.1 - 129.7	H	%Rec	1	11/10/2021 1:16:00 PM
Surr: 2-Fluorobiphenyl	83.8	33.1 - 126.2	H	%Rec	1	11/10/2021 1:16:00 PM
Surr: 2-Fluorophenol	67.3	13.4 - 127.1	H	%Rec	1	11/10/2021 1:16:00 PM
Surr: 4-Terphenyl-d14	80.5	41 - 140	H	%Rec	1	11/10/2021 1:16:00 PM
Surr: Nitrobenzene-d5	86.2	28.9 - 129.9	H	%Rec	1	11/10/2021 1:16:00 PM
Surr: Phenol-d6	62.2	10.6 - 128.5	H	%Rec	1	11/10/2021 1:16:00 PM
VOLATILE ORGANICS BY GC/MS				**SW8260D**	**SW 5030B**	Analyst: **TB**
Benzene	ND	0.300		µg/L	1	10/14/2021 3:44:00 PM
Toluene	ND	1.00		µg/L	1	10/14/2021 3:44:00 PM
Surr: 1,2-Dichloroethane-d4	128	75.3 - 126	SMI	%Rec	1	10/14/2021 3:44:00 PM
Surr: 4-Bromofluorobenzene	96.2	78.1 - 120		%Rec	1	10/14/2021 3:44:00 PM
Surr: Dibromofluoromethane	129	74.2 - 122	SMI	%Rec	1	10/14/2021 3:44:00 PM
Surr: Toluene-d8	98.5	76.2 - 135		%Rec	1	10/14/2021 3:44:00 PM

CLIENT: RSEC Environmental Inc.
Project: EKC-1021

Lab ID: 2110025-013 **Matrix:** GROUNDWATER
Client Sample ID E-Sump MS/MSD **Collection Date:** 10/1/2021 11:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
SEMIVOLATILE ORGANICS-LOW LEVEL				**SW8270E**	**SW 3510C**	Analyst: **mjf**
Biphenyl	ND	0.474	H	µg/L	1	11/10/2021 1:47:00 PM
Diphenyl ether	100	0.474	H	µg/L	1	11/10/2021 1:47:00 PM
Surr: 2,4,6-Tribromophenol	79.3	33.1 - 129.7	H	%Rec	1	11/10/2021 1:47:00 PM
Surr: 2-Fluorobiphenyl	83.4	33.1 - 126.2	H	%Rec	1	11/10/2021 1:47:00 PM
Surr: 2-Fluorophenol	64.3	13.4 - 127.1	H	%Rec	1	11/10/2021 1:47:00 PM
Surr: 4-Terphenyl-d14	79.6	41 - 140	H	%Rec	1	11/10/2021 1:47:00 PM
Surr: Nitrobenzene-d5	80.6	28.9 - 129.9	H	%Rec	1	11/10/2021 1:47:00 PM
Surr: Phenol-d6	73.2	10.6 - 128.5	H	%Rec	1	11/10/2021 1:47:00 PM
VOLATILE ORGANICS BY GC/MS				**SW8260D**	**SW 5030B**	Analyst: **TB**
Benzene	ND	0.300		µg/L	1	10/14/2021 4:06:00 PM
Toluene	ND	1.00		µg/L	1	10/14/2021 4:06:00 PM
Surr: 1,2-Dichloroethane-d4	129	75.3 - 126	SMI	%Rec	1	10/14/2021 4:06:00 PM
Surr: 4-Bromofluorobenzene	96.7	78.1 - 120		%Rec	1	10/14/2021 4:06:00 PM
Surr: Dibromofluoromethane	129	74.2 - 122	SMI	%Rec	1	10/14/2021 4:06:00 PM
Surr: Toluene-d8	98.7	76.2 - 135		%Rec	1	10/14/2021 4:06:00 PM

CLIENT: RSEC Environmental Inc.
Project: EKC-1021

Lab ID: 2110025-014 **Matrix:** GROUNDWATER
Client Sample ID W-Sump **Collection Date:** 10/1/2021

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
SEMIVOLATILE ORGANICS-LOW LEVEL				**SW8270E**	**SW 3510C**	Analyst: **mjf**
Biphenyl	ND	0.474	H	µg/L	1	11/10/2021 2:18:00 PM
Diphenyl ether	119	0.474	H	µg/L	1	11/10/2021 2:18:00 PM
Surr: 2,4,6-Tribromophenol	85.2	33.1 - 129.7	H	%Rec	1	11/10/2021 2:18:00 PM
Surr: 2-Fluorobiphenyl	76.8	33.1 - 126.2	H	%Rec	1	11/10/2021 2:18:00 PM
Surr: 2-Fluorophenol	62.3	13.4 - 127.1	H	%Rec	1	11/10/2021 2:18:00 PM
Surr: 4-Terphenyl-d14	84.7	41 - 140	H	%Rec	1	11/10/2021 2:18:00 PM
Surr: Nitrobenzene-d5	86.9	28.9 - 129.9	H	%Rec	1	11/10/2021 2:18:00 PM
Surr: Phenol-d6	62.1	10.6 - 128.5	H	%Rec	1	11/10/2021 2:18:00 PM
VOLATILE ORGANICS BY GC/MS				**SW8260D**	**SW 5030B**	Analyst: **TB**
Benzene	0.500	0.300		µg/L	1	10/14/2021 4:28:00 PM
Toluene	ND	1.00		µg/L	1	10/14/2021 4:28:00 PM
Surr: 1,2-Dichloroethane-d4	128	75.3 - 126	SMI	%Rec	1	10/14/2021 4:28:00 PM
Surr: 4-Bromofluorobenzene	97.8	78.1 - 120		%Rec	1	10/14/2021 4:28:00 PM
Surr: Dibromofluoromethane	131	74.2 - 122	SMI	%Rec	1	10/14/2021 4:28:00 PM
Surr: Toluene-d8	98.8	76.2 - 135		%Rec	1	10/14/2021 4:28:00 PM

QC SUMMARY REPORT

Specialty Analytical

WO#: **2110025**

12/3/2021

Client: RSEC Environmental Inc.

Project: EKC-1021 **TestCode:** **8260_W**

Sample ID: **CCV1 40ppb**	SampType: **CCV**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **42290**
Client ID: **CCV**	Batch ID: **18654**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **10/14/2021**	SeqNo: **541956**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	39.4	0.300	40.00	0	98.5	80	120				
Toluene	39.9	1.00	40.00	0	99.7	80	120				

Sample ID: **MB**	SampType: **MBLK**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **42290**
Client ID: **PBW**	Batch ID: **18654**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **10/14/2021**	SeqNo: **541957**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.300									
Toluene	ND	1.00									
Surr: 1,2-Dichloroethane-d4	121		100.0		121	75.3	126				
Surr: 4-Bromofluorobenzene	98.4		100.0		98.4	78.1	120				
Surr: Dibromofluoromethane	122		100.0		122	74.2	122				
Surr: Toluene-d8	99.5		100.0		99.5	76.2	135				

Sample ID: **2110025-011AMS**	SampType: **MS**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **42290**
Client ID: **ISRW-11**	Batch ID: **18654**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **10/14/2021**	SeqNo: **541973**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	53600	300	40000	0	134	74.1	136				
Toluene	43000	1000	40000	1870	103	68.4	135				

QC SUMMARY REPORT

Specialty Analytical

WO#: **2110025**

12/3/2021

Client: RSEC Environmental Inc.

Project: EKC-1021 **TestCode:** **8260_W**

Sample ID: **2110025-011AMS**	SampType: **MS**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **42290**
Client ID: **ISRW-11**	Batch ID: **18654**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **10/14/2021**	SeqNo: **541973**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID: **LCS**	SampType: **LCS**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **42290**
Client ID: **LCSW**	Batch ID: **18654**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **10/14/2021**	SeqNo: **541974**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	39.4	0.300	40.00	0	98.5	76.8	125				
Toluene	39.9	1.00	40.00	0	99.7	82	122				

Sample ID: **CCV1 40ppb**	SampType: **CCV**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **42290**
Client ID: **CCV**	Batch ID: **18654**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **10/15/2021**	SeqNo: **541995**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Toluene	37.8	1.00	40.00	0	94.6	80	120				

Sample ID: **CCB**	SampType: **CCB**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **42290**
Client ID: **CCB**	Batch ID: **18654**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **10/15/2021**	SeqNo: **541997**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Toluene	ND	1.00									

QC SUMMARY REPORT

Specialty Analytical

WO#: **2110025**

12/3/2021

Client: RSEC Environmental Inc.

Project: EKC-1021 **TestCode:** **8260_W**

Sample ID: **CCB**	SampType: **CCB**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **42290**
Client ID: **CCB**	Batch ID: **18654**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **10/15/2021**	SeqNo: **541997**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	100		100.0		100	75.3	126				
Surr: 4-Bromofluorobenzene	97.8		100.0		97.8	78.1	120				
Surr: Dibromofluoromethane	101		100.0		101	74.2	122				
Surr: Toluene-d8	99.2		100.0		99.2	76.2	135				

Sample ID: **CCV1 40ppb**	SampType: **CCV**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **42292**
Client ID: **CCV**	Batch ID: **18654**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **10/15/2021**	SeqNo: **542163**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	38.2	0.300	40.00	0	95.6	80	120				
Toluene	37.8	1.00	40.00	0	94.6	80	120				

Sample ID: **MB-18654**	SampType: **MBLK**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **42292**
Client ID: **PBW**	Batch ID: **18654**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **10/15/2021**	SeqNo: **542165**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.300									
Toluene	ND	1.00									
Surr: 1,2-Dichloroethane-d4	100		100.0		100	75.3	126				
Surr: 4-Bromofluorobenzene	97.8		100.0		97.8	78.1	120				

QC SUMMARY REPORT

Specialty Analytical

WO#: **2110025**

12/3/2021

Client: RSEC Environmental Inc.

Project: EKC-1021 **TestCode:** **8260_W**

Sample ID: **MB-18654**	SampType: **MBLK**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **42292**
Client ID: **PBW**	Batch ID: **18654**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **10/15/2021**	SeqNo: **542165**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Dibromofluoromethane	101		100.0		101	74.2	122				
Surr: Toluene-d8	99.2		100.0		99.2	76.2	135				

Sample ID: **LCS 40ppb**	SampType: **LCS**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **42292**
Client ID: **LCSW**	Batch ID: **18654**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **10/15/2021**	SeqNo: **542166**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	38.2	0.300	40.00	0	95.6	76.8	125				
Toluene	37.8	1.00	40.00	0	94.6	82	122				

Sample ID: **2109242-002AMS**	SampType: **MS**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **42292**
Client ID: **BatchQC**	Batch ID: **18654**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **10/15/2021**	SeqNo: **542173**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	49.5	0.300	40.00	0	124	74.1	136				
Toluene	37.9	1.00	40.00	0	94.7	68.4	135				

QC SUMMARY REPORT

Specialty Analytical

WO#: **2110025**

12/3/2021

Client: RSEC Environmental Inc.

Project: EKC-1021 **TestCode:** **8270LL_W**

Sample ID: **LCS-18636**	SampType: **LCS**	TestCode: **8270LL_W**	Units: **µg/L**	Prep Date: **10/6/2021**	RunNo: **42603**
Client ID: **LCSW**	Batch ID: **18636**	TestNo: **SW8270E**	**SW 3510C**	Analysis Date: **11/10/2021**	SeqNo: **546528**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diphenyl ether	36.7	0.500	40.00	0	91.8	50	130				

Sample ID: **LCSD-18636**	SampType: **LCSD**	TestCode: **8270LL_W**	Units: **µg/L**	Prep Date: **10/6/2021**	RunNo: **42603**
Client ID: **LCSS02**	Batch ID: **18636**	TestNo: **SW8270E**	**SW 3510C**	Analysis Date: **11/10/2021**	SeqNo: **546529**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diphenyl ether	35.6	0.500	40.00	0	89.0	50	130	36.73	3.10	30	

Sample ID: **MB-18636**	SampType: **MBLK**	TestCode: **8270LL_W**	Units: **µg/L**	Prep Date: **10/6/2021**	RunNo: **42603**
Client ID: **PBW**	Batch ID: **18636**	TestNo: **SW8270E**	**SW 3510C**	Analysis Date: **11/10/2021**	SeqNo: **546530**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diphenyl ether	ND	0.500									
Surr: 2,4,6-Tribromophenol	84.3		100.0		84.3	33.1	129.7				
Surr: 2-Fluorobiphenyl	86.7		100.0		86.7	33.1	126.2				
Surr: 2-Fluorophenol	51.4		100.0		51.4	13.4	127.1				
Surr: 4-Terphenyl-d14	76.2		100.0		76.2	41	140				
Surr: Nitrobenzene-d5	79.2		100.0		79.2	28.9	129.9				
Surr: Phenol-d6	68.1		100.0		68.1	10.6	128.5				

QC SUMMARY REPORT

Specialty Analytical

WO#: **2110025**

12/3/2021

Client: RSEC Environmental Inc.

Project: EKC-1021 **TestCode:** **8270LL_W**

Sample ID: **CCV**	SampType: **CCV**	TestCode: **8270LL_W**	Units: **µg/L**	Prep Date:	RunNo: **42603**
Client ID: **CCV**	Batch ID: **18636**	TestNo: **SW8270E**	**SW 3510C**	Analysis Date: **11/10/2021**	SeqNo: **546741**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diphenyl ether	18.4	0.500	20.00	0	92.2	80	120				

Sample ID: **2111025-013AMS**	SampType: **MS**	TestCode: **8270LL_W**	Units: **µg/L**	Prep Date:	RunNo: **42603**
Client ID: **BatchQC**	Batch ID: **18636**	TestNo: **SW8270E**	**SW 3510C**	Analysis Date: **11/10/2021**	SeqNo: **546742**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diphenyl ether	33.5	0.500	40.00	100.5	-168	30	140				SH

Sample ID: **2111025-013AMSD**	SampType: **MSD**	TestCode: **8270LL_W**	Units: **µg/L**	Prep Date:	RunNo: **42603**
Client ID: **BatchQC**	Batch ID: **18636**	TestNo: **SW8270E**	**SW 3510C**	Analysis Date: **11/10/2021**	SeqNo: **546743**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diphenyl ether	32.2	0.500	40.00	100.5	-171	30	140	33.46	3.90	30	SH

Specialty Analytical
9011 SE Jannsen Rd
Clackamas, Oregon 97015
TEL: 503-607-1331 FAX: 503-607-1336
Website: www.specialtyanalytical.com

Sample Receipt Checklist

Client Name RSEC Work Order Numbe 2110025

RcptNo: 1 Date and Time Receive 10/1/2021 4:25:46 PM Received by Rich Sinclair

Completed by Reviewed by:

Completed Date: 10/1/2021 4:44:11 PM Reviewed Date: 10/4/2021 9:45:04 AM

Carrier name Client

Chain of custody present?	Yes ☑	No ☐		
Chain of custody signed when relinquished and received?	Yes ☑	No ☐		
Chain of custody agrees with sample labels?	Yes ☑	No ☐	Not Presen	☐
Are matrices correctly identified on Chain of custody?	Yes ☑	No ☐		
Is it clear what analyses were requested?	Yes ☑	No ☐		
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Presen	☑
Samples in proper container/bottle?	Yes ☑	No ☐		
Were correct preservatives used and noted?	Yes ☑	No ☐	NA	☐
Sample containers intact?	Yes ☑	No ☐		
Sufficient sample volume for indicated test?	Yes ☑	No ☐		
Were container lables complete (ID, Pres, Date)?	Yes ☑	No ☐		
All samples received within holding time?	Yes ☑	No ☐		
Was an attempt made to cool the samples?	Yes ☑	No ☐	NA	☐
All samples received at a temp. of > 0° C to 6.0° C?	Yes ☐	No ☑	NA	☐
Response when temperature is outside of range:	Samples were collected the same day and chilled.			
Preservative added to bottles:				
Sample Temp. taken and recorded upon receipt?	Yes ☑	No ☐	8 To	15 º
Water - Were bubbles absent in VOC vials?	Yes ☐	No ☐	No Vials	☑
Water - Was there Chlorine Present?	Yes ☐	No ☐	NA	☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	NA	☑
Are Samples considered acceptable?	Yes ☑	No ☐		
Custody Seals present?	Yes ☐	No ☑		
Traffic Report or Packing Lists present?	Yes ☐	No ☑		
Airbill or Sticker?	Air Bill ☐	Sticker ☐	Not Present	☑
Airbill No:				
Sample Tags Present?	Yes ☐	No ☑		
Sample Tags Listed on COC?	Yes ☐	No ☑		
Tag Numbers:				
Sample Condition?	Intact ☑	Broken ☐	Leaking	☐

Case Number: SDG: SAS:

Adjusted? _____ Checked b

Any No and/or NA (not applicable) response must be detailed in the comments section be

Specialty Analytical
9011 SE Jannsen Rd
Clackamas, Oregon 97015
TEL: 503-607-1331 FAX: 503-607-1336
Website: www.specialtyanalytical.com

Sample Receipt Checklist

Client Contacted? ☐ Yes ☑ No ☐ NA Person Contacted: Comments:

Contact Mode: ☐ Phone: ☐ Fax: ☐ Email: ☐ In Person:

Client Instructions:

Date Contacted: Contacted By:

Regarding:

CorrectiveAction:

www.specialtyanalytical.com

Chain of Custody Record

Specialty Analytical
9011 SE Jannsen Rd
Clackamas, OR 97015
Phone: 503-607-1331
Fax: 503-607-1336

Date: 10/1/2021 Page: 1 of: 2

Laboratory Project No (internal): 2110025

Project Name: Emerald Kalama

Temperature on Receipt: 8-15 °C

Client: RSEC Environmental

Project No: EKC-1021 PO No: EKC-1021

Cooling: Ice Shipped Via: Client

Address: 958 Hood View Ct.

Collected by: R. Troux

Custody Seal: Y (N) Intact / Broken Cooler / Bottle

City, State, Zip: Hood River, OR 97031

State Collected: OR (WA) OTHER

MDL TIER IV EDD

Telephone: 541-490-4223

Report To (PM): ↓

Sample Disposal: ☐ Return to client ☑ Disposal by lab (after 60 days)

AP Email: richarsecinc.com

PM Email: richarsecinc.com

	Sample Name	Sample Date	Sample Time	Sample Matrix*	# of Containers	Requested Tests: 8021 benzene + toluene												Comments
1	ISRW-1	10/1	0900	GW	3	X												Samples are from
2	ISRW-2b		0910															continual pump wells
3	ISRW-3		0920															color/Sed. ~~not~~ if any
4	ISRW-4		0930															~~are~~ what is pumping
5	ISRW-5		0940															f/well
6	ISRW-6		0950															
7	ISRW-7		1000															
8	ISRW-8		1010															
9	ISRW-9		1020															
10	ISRW-10	↓	1030	↓	↓	↓												

*Matrix: A = Air, AQ = Aqueous, L=Liquid, O = Oil, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water, M = Miscellaneous

Turn-around Time: Standard (5-7 Business): X 3 Day: ____ 2 Day: ____ Next Day: ____ Same Day: ____
Expedited turn-around requests should be coordinated in advance

Relinquished	Date/Time	Received	Date/Time
x [signature]	10/1/21 1625	x [signature]	10/1/21 16:25
x		x	
x		x	

Chain of Custody Record

Specialty Analytical
9011 SE Jannsen Rd
Clackamas, OR 97015
Phone: 503-607-1331
Fax: 503-607-1336

Date: 10/1/2021 Page: 2 of: 2
Project Name: Emerald Kalama
Project No: ERC-1021 PO No: ERC-1021
Collected by: R. Trout
State Collected: OR (WA) OTHER
Report To (PM):

Laboratory Project No (internal): 2110025
Temperature on Receipt: 8 - 15 °C
Cooling: Ice Shipped Via: Client
Custody Seal: Y / (N) Intact / Broken Cooler / Bottle
MDL TIER IV EDD
Sample Disposal: ☐ Return to client ☐ Disposal by lab (after 60 days)

Client: RSEC Environmental
Address: 958 Hood View Ct
City, State, Zip: Hood River OR 97031
Telephone: 541-490-4223
AP Email: rich@rsecinc.com
PM Email: rich@rsecinc.com

#	Sample Name	Sample Date	Sample Time	Sample Matrix*	# of Containers	Requested Tests: 8021 B+T	8260 B+T	8270 Diphenyl and diphenyl oxide (DPO)	Comments
1	ISRW-11	10/1	1040	GW	3	X			
2	E-Sump	↓	1115	↓	4		X	X	
3	E-Sump MS/MSD		1130		6		X	X	
4	W-Sump	↓	1200	↓	4		X	X	
5									
6									
7									
8									
9									
10									

*Matrix: A = Air, AQ = Aqueous, L=Liquid, O = Oil, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water, M = Miscellaneous

Turn-around Time: Standard (5-7 Business): X 3 Day: _____ 2 Day: _____ Next Day: _____ Same Day: _____
Expedited turn-around requests should be coordinated in advance

Relinquished	Date/Time	Received	Date/Time
x [signature]	10/1/21 1625	x [signature]	10/1/21 16:25
x		x	
x		x	

Specialty Analytical

9011 SE Jannsen Rd
Clackamas, OR 97015
TEL: (503) 607-1331
Website: www.specialtyanalytical.com

December 06, 2021

Rich Truax
RSEC Environmental Inc.
958 Hood View Ct.
Hood River, OR 97031
TEL: (541) 490-4223
FAX

RE: Kalama Chemical/ EKC-1021 Order No.: 2110059

Dear Rich Truax:

REVISED REPORT: Please see case narrative for information on revision.

There were no problems with the analysis and all data for associated QC met EPA or laboratory specifications, except where noted in the Case Narrative, or as qualified with flags. Results apply only to the samples analyzed. Without approval of the laboratory, the reproduction of this report is only permitted in its entirety.

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

Sincerely,

Marty French
Lab Director

CLIENT: RSEC Environmental Inc.
Project: Kalama Chemical/ EKC-1021

Lab ID: 2110059-001 **Matrix:** GROUNDWATER
Client Sample ID MW-256 **Collection Date:** 10/4/2021 12:00:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
SEMIVOLATILE ORGANICS-LOW LEVEL				**SW8270E**	**SW 3510C**	Analyst: **mjf**
Diphenyl ether	8.24	4.79		µg/L	10	11/10/2021 3:51:00 PM
Surr: 2,4,6-Tribromophenol	76.5	33.1 - 129.7		%Rec	10	11/10/2021 3:51:00 PM
Surr: 2-Fluorobiphenyl	82.3	33.1 - 126.2		%Rec	10	11/10/2021 3:51:00 PM
Surr: 2-Fluorophenol	58.4	13.4 - 127.1		%Rec	10	11/10/2021 3:51:00 PM
Surr: 4-Terphenyl-d14	72.1	41 - 140		%Rec	10	11/10/2021 3:51:00 PM
Surr: Nitrobenzene-d5	79.2	28.9 - 129.9		%Rec	10	11/10/2021 3:51:00 PM
Surr: Phenol-d6	80.6	10.6 - 128.5		%Rec	10	11/10/2021 3:51:00 PM

Lab ID: 2110059-002 **Matrix:** GROUNDWATER
Client Sample ID MW-245 **Collection Date:** 10/4/2021 5:50:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
SEMIVOLATILE ORGANICS-LOW LEVEL				**SW8270E**	**SW 3510C**	Analyst: **mjf**
Diphenyl ether	101	4.82		µg/L	10	11/10/2021 4:22:00 PM
Surr: 2,4,6-Tribromophenol	84.6	33.1 - 129.7		%Rec	10	11/10/2021 4:22:00 PM
Surr: 2-Fluorobiphenyl	80.2	33.1 - 126.2		%Rec	10	11/10/2021 4:22:00 PM
Surr: 2-Fluorophenol	67.4	13.4 - 127.1		%Rec	10	11/10/2021 4:22:00 PM
Surr: 4-Terphenyl-d14	54.7	41 - 140		%Rec	10	11/10/2021 4:22:00 PM
Surr: Nitrobenzene-d5	68.1	28.9 - 129.9		%Rec	10	11/10/2021 4:22:00 PM
Surr: Phenol-d6	43.1	10.6 - 128.5		%Rec	10	11/10/2021 4:22:00 PM

CLIENT: RSEC Environmental Inc.
Project: Kalama Chemical/ EKC-1021

Lab ID: 2110059-003 **Matrix:** GROUNDWATER
Client Sample ID KC-9 **Collection Date:** 10/4/2021 4:40:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
SEMIVOLATILE ORGANICS-LOW LEVEL				**SW8270E**	**SW 3510C**	Analyst: **mjf**
Diphenyl ether	2630	48.1		µg/L	100	11/10/2021 4:53:00 PM
Surr: 2,4,6-Tribromophenol	41.2	33.1 - 129.7		%Rec	100	11/10/2021 4:53:00 PM
Surr: 2-Fluorobiphenyl	37.6	33.1 - 126.2		%Rec	100	11/10/2021 4:53:00 PM
Surr: 2-Fluorophenol	29.4	13.4 - 127.1		%Rec	100	11/10/2021 4:53:00 PM
Surr: 4-Terphenyl-d14	38.9	41 - 140	S	%Rec	100	11/10/2021 4:53:00 PM
Surr: Nitrobenzene-d5	42.7	28.9 - 129.9		%Rec	100	11/10/2021 4:53:00 PM
Surr: Phenol-d6	48.1	10.6 - 128.5		%Rec	100	11/10/2021 4:53:00 PM
VOLATILE ORGANICS BY GC/MS				**SW8260D**	**SW 5030B**	Analyst: **TB**
Benzene	2.96	0.300		µg/L	1	10/15/2021 5:00:00 PM
Toluene	ND	1.00		µg/L	1	10/15/2021 5:00:00 PM
Surr: 1,2-Dichloroethane-d4	127	75.3 - 126	SMI	%Rec	1	10/15/2021 5:00:00 PM
Surr: 4-Bromofluorobenzene	98.2	78.1 - 120		%Rec	1	10/15/2021 5:00:00 PM
Surr: Dibromofluoromethane	126	74.2 - 122	SMI	%Rec	1	10/15/2021 5:00:00 PM
Surr: Toluene-d8	97.7	76.2 - 135		%Rec	1	10/15/2021 5:00:00 PM

Lab ID: 2110059-004 **Matrix:** GROUNDWATER
Client Sample ID PDW-117 **Collection Date:** 10/4/2021 4:00:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
SEMIVOLATILE ORGANICS-LOW LEVEL				**SW8270E**	**SW 3510C**	Analyst: **mjf**
Diphenyl ether	1030	48.4		µg/L	100	11/10/2021 5:24:00 PM
Surr: 2,4,6-Tribromophenol	46.1	33.1 - 129.7		%Rec	100	11/10/2021 5:24:00 PM
Surr: 2-Fluorobiphenyl	46.1	33.1 - 126.2		%Rec	100	11/10/2021 5:24:00 PM
Surr: 2-Fluorophenol	37.8	13.4 - 127.1		%Rec	100	11/10/2021 5:24:00 PM
Surr: 4-Terphenyl-d14	29.7	41 - 140	S	%Rec	100	11/10/2021 5:24:00 PM
Surr: Nitrobenzene-d5	18.4	28.9 - 129.9	S	%Rec	100	11/10/2021 5:24:00 PM
Surr: Phenol-d6	23.3	10.6 - 128.5		%Rec	100	11/10/2021 5:24:00 PM
VOLATILE ORGANICS BY GC/MS				**SW8260D**	**SW 5030B**	Analyst: **TB**
Benzene	0.680	0.300		µg/L	1	10/15/2021 5:22:00 PM
Toluene	ND	1.00		µg/L	1	10/15/2021 5:22:00 PM
Surr: 1,2-Dichloroethane-d4	129	75.3 - 126	SMI	%Rec	1	10/15/2021 5:22:00 PM
Surr: 4-Bromofluorobenzene	97.6	78.1 - 120		%Rec	1	10/15/2021 5:22:00 PM
Surr: Dibromofluoromethane	130	74.2 - 122	SMI	%Rec	1	10/15/2021 5:22:00 PM
Surr: Toluene-d8	96.9	76.2 - 135		%Rec	1	10/15/2021 5:22:00 PM

CLIENT: RSEC Environmental Inc.
Project: Kalama Chemical/ EKC-1021

Lab ID: 2110059-005 **Matrix:** GROUNDWATER
Client Sample ID MW-231 **Collection Date:** 10/6/2021 8:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
SEMIVOLATILE ORGANICS-LOW LEVEL				**SW8270E**	**SW 3510C**	Analyst: **mjf**
Diphenyl ether	51.1	4.80		µg/L	10	11/10/2021 5:55:00 PM
Surr: 2,4,6-Tribromophenol	62.7	33.1 - 129.7		%Rec	10	11/10/2021 5:55:00 PM
Surr: 2-Fluorobiphenyl	41.8	33.1 - 126.2		%Rec	10	11/10/2021 5:55:00 PM
Surr: 2-Fluorophenol	38.7	13.4 - 127.1		%Rec	10	11/10/2021 5:55:00 PM
Surr: 4-Terphenyl-d14	64.9	41 - 140		%Rec	10	11/10/2021 5:55:00 PM
Surr: Nitrobenzene-d5	58.8	28.9 - 129.9		%Rec	10	11/10/2021 5:55:00 PM
Surr: Phenol-d6	60.8	10.6 - 128.5		%Rec	10	11/10/2021 5:55:00 PM
VOLATILE ORGANICS BY GC/MS				**SW8260D**	**SW 5030B**	Analyst: **TB**
Benzene	0.370	0.300		µg/L	1	10/19/2021 8:56:00 PM
Toluene	3.65	1.00		µg/L	1	10/19/2021 8:56:00 PM
Surr: 1,2-Dichloroethane-d4	102	75.3 - 126		%Rec	1	10/19/2021 8:56:00 PM
Surr: 4-Bromofluorobenzene	99.8	78.1 - 120		%Rec	1	10/19/2021 8:56:00 PM
Surr: Dibromofluoromethane	103	74.2 - 122		%Rec	1	10/19/2021 8:56:00 PM
Surr: Toluene-d8	97.3	76.2 - 135		%Rec	1	10/19/2021 8:56:00 PM

Lab ID: 2110059-006 **Matrix:** GROUNDWATER
Client Sample ID MW-230 **Collection Date:** 10/6/2021 9:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
SEMIVOLATILE ORGANICS-LOW LEVEL				**SW8270E**	**SW 3510C**	Analyst: **mjf**
Diphenyl ether	375	47.8		µg/L	100	11/10/2021 6:26:00 PM
Surr: 2,4,6-Tribromophenol	45.2	33.1 - 129.7		%Rec	100	11/10/2021 6:26:00 PM
Surr: 2-Fluorobiphenyl	31.8	33.1 - 126.2	S	%Rec	100	11/10/2021 6:26:00 PM
Surr: 2-Fluorophenol	24.4	13.4 - 127.1		%Rec	100	11/10/2021 6:26:00 PM
Surr: 4-Terphenyl-d14	39.1	41 - 140	S	%Rec	100	11/10/2021 6:26:00 PM
Surr: Nitrobenzene-d5	41.6	28.9 - 129.9		%Rec	100	11/10/2021 6:26:00 PM
Surr: Phenol-d6	52.2	10.6 - 128.5		%Rec	100	11/10/2021 6:26:00 PM
VOLATILE ORGANICS BY GC/MS				**SW8260D**	**SW 5030B**	Analyst: **TB**
Benzene	2.18	0.300		µg/L	1	10/15/2021 5:44:00 PM
Toluene	ND	1.00		µg/L	1	10/15/2021 5:44:00 PM
Surr: 1,2-Dichloroethane-d4	128	75.3 - 126	SMI	%Rec	1	10/15/2021 5:44:00 PM
Surr: 4-Bromofluorobenzene	96.8	78.1 - 120		%Rec	1	10/15/2021 5:44:00 PM
Surr: Dibromofluoromethane	132	74.2 - 122	SMI	%Rec	1	10/15/2021 5:44:00 PM
Surr: Toluene-d8	96.5	76.2 - 135		%Rec	1	10/15/2021 5:44:00 PM

CLIENT: RSEC Environmental Inc.
Project: Kalama Chemical/ EKC-1021

Lab ID: 2110059-007 **Matrix:** GROUNDWATER
Client Sample ID PZ-104 **Collection Date:** 10/4/2021 6:45:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
SEMIVOLATILE ORGANICS-LOW LEVEL				**SW8270E**	**SW 3510C**	Analyst: **mjf**
Biphenyl	81.5	47.9		µg/L	100	11/10/2021 6:57:00 PM
Bis(2-ethylhexyl)phthalate	ND	47.9	Q	µg/L	100	11/10/2021 6:57:00 PM
Diphenyl ether	4300	47.9		µg/L	100	11/10/2021 6:57:00 PM
Surr: 2,4,6-Tribromophenol	41.6	33.1 - 129.7		%Rec	100	11/10/2021 6:57:00 PM
Surr: 2-Fluorobiphenyl	32.2	33.1 - 126.2	S	%Rec	100	11/10/2021 6:57:00 PM
Surr: 2-Fluorophenol	30.5	13.4 - 127.1		%Rec	100	11/10/2021 6:57:00 PM
Surr: 4-Terphenyl-d14	4.33	41 - 140	S	%Rec	100	11/10/2021 6:57:00 PM
Surr: Nitrobenzene-d5	52.4	28.9 - 129.9		%Rec	100	11/10/2021 6:57:00 PM
Surr: Phenol-d6	46.8	10.6 - 128.5		%Rec	100	11/10/2021 6:57:00 PM
VOLATILE ORGANICS BY GC/MS				**SW8260D**	**SW 5030B**	Analyst: **TB**
Benzene	0.970	0.300		µg/L	1	10/15/2021 6:06:00 PM
Toluene	ND	1.00		µg/L	1	10/15/2021 6:06:00 PM
Surr: 1,2-Dichloroethane-d4	130	75.3 - 126	SMI	%Rec	1	10/15/2021 6:06:00 PM
Surr: 4-Bromofluorobenzene	98.2	78.1 - 120		%Rec	1	10/15/2021 6:06:00 PM
Surr: Dibromofluoromethane	133	74.2 - 122	SMI	%Rec	1	10/15/2021 6:06:00 PM
Surr: Toluene-d8	97.9	76.2 - 135		%Rec	1	10/15/2021 6:06:00 PM

CLIENT: RSEC Environmental Inc.
Project: Kalama Chemical/ EKC-1021

Lab ID: 2110059-008 **Matrix:** GROUNDWATER
Client Sample ID PZ-107 **Collection Date:** 10/4/2021 7:45:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
SEMIVOLATILE ORGANICS-LOW LEVEL				**SW8270E**	**SW 3510C**	Analyst: **mjf**
Biphenyl	60.9	0.345		µg/L	100	11/10/2021 7:28:00 PM
Bis(2-ethylhexyl)phthalate	ND	0.345		µg/L	100	11/10/2021 7:28:00 PM
Diphenyl ether	21.8	0.345		µg/L	100	11/10/2021 7:28:00 PM
Surr: 2,4,6-Tribromophenol	74.3	33.1 - 129.7		%Rec	100	11/10/2021 7:28:00 PM
Surr: 2-Fluorobiphenyl	69.1	33.1 - 126.2		%Rec	100	11/10/2021 7:28:00 PM
Surr: 2-Fluorophenol	41.4	13.4 - 127.1		%Rec	100	11/10/2021 7:28:00 PM
Surr: 4-Terphenyl-d14	49.7	41 - 140		%Rec	100	11/10/2021 7:28:00 PM
Surr: Nitrobenzene-d5	68.4	28.9 - 129.9		%Rec	100	11/10/2021 7:28:00 PM
Surr: Phenol-d6	73.2	10.6 - 128.5		%Rec	100	11/10/2021 7:28:00 PM
VOLATILE ORGANICS BY GC/MS				**SW8260D**	**SW 5030B**	Analyst: **TB**
Benzene	ND	0.300		µg/L	1	10/15/2021 6:28:00 PM
Toluene	ND	1.00		µg/L	1	10/15/2021 6:28:00 PM
Surr: 1,2-Dichloroethane-d4	129	75.3 - 126	SMI	%Rec	1	10/15/2021 6:28:00 PM
Surr: 4-Bromofluorobenzene	97.9	78.1 - 120		%Rec	1	10/15/2021 6:28:00 PM
Surr: Dibromofluoromethane	132	74.2 - 122	SMI	%Rec	1	10/15/2021 6:28:00 PM
Surr: Toluene-d8	98.1	76.2 - 135		%Rec	1	10/15/2021 6:28:00 PM

CLIENT: RSEC Environmental Inc.
Project: Kalama Chemical/ EKC-1021

Lab ID: 2110059-009 **Matrix:** GROUNDWATER
Client Sample ID PZ-401 **Collection Date:** 10/4/2021 5:00:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
SEMIVOLATILE ORGANICS-LOW LEVEL				**SW8270E**	**SW 3510C**	Analyst: **mjf**
Biphenyl	3430	47.8		µg/L	100	11/10/2021 7:59:00 PM
Bis(2-ethylhexyl)phthalate	ND	47.8		µg/L	100	11/10/2021 7:59:00 PM
Diphenyl ether	4080	19.1		µg/L	100	11/10/2021 7:59:00 PM
Surr: 2,4,6-Tribromophenol	61.7	33.1 - 129.7		%Rec	100	11/10/2021 7:59:00 PM
Surr: 2-Fluorobiphenyl	54.1	33.1 - 126.2		%Rec	100	11/10/2021 7:59:00 PM
Surr: 2-Fluorophenol	30.4	13.4 - 127.1		%Rec	100	11/10/2021 7:59:00 PM
Surr: 4-Terphenyl-d14	42.8	41 - 140		%Rec	100	11/10/2021 7:59:00 PM
Surr: Nitrobenzene-d5	49.3	28.9 - 129.9		%Rec	100	11/10/2021 7:59:00 PM
Surr: Phenol-d6	62.4	10.6 - 128.5		%Rec	100	11/10/2021 7:59:00 PM
VOLATILE ORGANICS BY GC/MS				**SW8260D**	**SW 5030B**	Analyst: **TB**
Benzene	0.760	0.300		µg/L	1	10/15/2021 6:50:00 PM
Toluene	ND	1.00		µg/L	1	10/15/2021 6:50:00 PM
Surr: 1,2-Dichloroethane-d4	103	75.3 - 126		%Rec	1	10/15/2021 6:50:00 PM
Surr: 4-Bromofluorobenzene	98.3	78.1 - 120		%Rec	1	10/15/2021 6:50:00 PM
Surr: Dibromofluoromethane	103	74.2 - 122		%Rec	1	10/15/2021 6:50:00 PM
Surr: Toluene-d8	98.3	76.2 - 135		%Rec	1	10/15/2021 6:50:00 PM

Lab ID: 2110059-010 **Matrix:** GROUNDWATER
Client Sample ID USRW-2 **Collection Date:** 10/6/2021 10:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
SEMIVOLATILE ORGANICS-LOW LEVEL				**SW8270E**	**SW 3510C**	Analyst: **mjf**
Diphenyl ether	ND	0.480		µg/L	100	11/10/2021 8:30:00 PM
Surr: 2,4,6-Tribromophenol	77.7	33.1 - 129.7		%Rec	100	11/10/2021 8:30:00 PM
Surr: 2-Fluorobiphenyl	66.9	33.1 - 126.2		%Rec	100	11/10/2021 8:30:00 PM
Surr: 2-Fluorophenol	53.5	13.4 - 127.1		%Rec	100	11/10/2021 8:30:00 PM
Surr: 4-Terphenyl-d14	76.2	41 - 140		%Rec	100	11/10/2021 8:30:00 PM
Surr: Nitrobenzene-d5	71.2	28.9 - 129.9		%Rec	100	11/10/2021 8:30:00 PM
Surr: Phenol-d6	76.7	10.6 - 128.5		%Rec	100	11/10/2021 8:30:00 PM

CLIENT: RSEC Environmental Inc.
Project: Kalama Chemical/ EKC-1021

Lab ID: 2110059-011 **Matrix:** GROUNDWATER
Client Sample ID KC-14 **Collection Date:** 10/6/2021 12:20:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS				**SW8260D**	**SW 5030B**	Analyst: **TB**
Benzene	ND	0.300		µg/L	1	10/19/2021 9:18:00 PM
Toluene	ND	1.00		µg/L	1	10/19/2021 9:18:00 PM
Surr: 1,2-Dichloroethane-d4	103	75.3 - 126		%Rec	1	10/19/2021 9:18:00 PM
Surr: 4-Bromofluorobenzene	97.7	78.1 - 120		%Rec	1	10/19/2021 9:18:00 PM
Surr: Dibromofluoromethane	106	74.2 - 122		%Rec	1	10/19/2021 9:18:00 PM
Surr: Toluene-d8	99.0	76.2 - 135		%Rec	1	10/19/2021 9:18:00 PM

Lab ID: 2110059-012 **Matrix:** GROUNDWATER
Client Sample ID MW-239 **Collection Date:** 10/6/2021 12:50:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS				**SW8260D**	**SW 5030B**	Analyst: **TB**
Benzene	ND	60.0	Q	µg/L	200	10/19/2021 10:25:00 PM
Toluene	1470	200		µg/L	200	10/19/2021 10:25:00 PM
Surr: 1,2-Dichloroethane-d4	101	75.3 - 126		%Rec	200	10/19/2021 10:25:00 PM
Surr: 4-Bromofluorobenzene	98.9	78.1 - 120		%Rec	200	10/19/2021 10:25:00 PM
Surr: Dibromofluoromethane	101	74.2 - 122		%Rec	200	10/19/2021 10:25:00 PM
Surr: Toluene-d8	101	76.2 - 135		%Rec	200	10/19/2021 10:25:00 PM

Lab ID: 2110059-013 **Matrix:** GROUNDWATER
Client Sample ID MW-243 **Collection Date:** 10/6/2021 11:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS				**SW8260D**	**SW 5030B**	Analyst: **TB**
Benzene	ND	0.300		µg/L	1	10/19/2021 9:40:00 PM
Toluene	ND	1.00		µg/L	1	10/19/2021 9:40:00 PM
Surr: 1,2-Dichloroethane-d4	102	75.3 - 126		%Rec	1	10/19/2021 9:40:00 PM
Surr: 4-Bromofluorobenzene	96.7	78.1 - 120		%Rec	1	10/19/2021 9:40:00 PM
Surr: Dibromofluoromethane	103	74.2 - 122		%Rec	1	10/19/2021 9:40:00 PM
Surr: Toluene-d8	99.5	76.2 - 135		%Rec	1	10/19/2021 9:40:00 PM

CLIENT: RSEC Environmental Inc.
Project: Kalama Chemical/ EKC-1021

Lab ID: 2110059-014 **Matrix:** GROUNDWATER
Client Sample ID MW-97 **Collection Date:** 10/6/2021 11:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS				**SW8260D**	**SW 5030B**	Analyst: **TB**
Benzene	54.0	30.0		µg/L	100	10/19/2021 10:47:00 PM
Toluene	1900	100		µg/L	100	10/19/2021 10:47:00 PM
Surr: 1,2-Dichloroethane-d4	101	75.3 - 126		%Rec	100	10/19/2021 10:47:00 PM
Surr: 4-Bromofluorobenzene	97.5	78.1 - 120		%Rec	100	10/19/2021 10:47:00 PM
Surr: Dibromofluoromethane	102	74.2 - 122		%Rec	100	10/19/2021 10:47:00 PM
Surr: Toluene-d8	101	76.2 - 135		%Rec	100	10/19/2021 10:47:00 PM

Lab ID: 2110059-015 **Matrix:** GROUNDWATER
Client Sample ID MW-250 **Collection Date:** 10/6/2021 1:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS				**SW8260D**	**SW 5030B**	Analyst: **TB**
Benzene	ND	0.300		µg/L	1	10/19/2021 10:03:00 PM
Toluene	ND	1.00		µg/L	1	10/19/2021 10:03:00 PM
Surr: 1,2-Dichloroethane-d4	101	75.3 - 126		%Rec	1	10/19/2021 10:03:00 PM
Surr: 4-Bromofluorobenzene	98.1	78.1 - 120		%Rec	1	10/19/2021 10:03:00 PM
Surr: Dibromofluoromethane	103	74.2 - 122		%Rec	1	10/19/2021 10:03:00 PM
Surr: Toluene-d8	99.7	76.2 - 135		%Rec	1	10/19/2021 10:03:00 PM

QC SUMMARY REPORT

Specialty Analytical

WO#: **2110059**

12/6/2021

Client: RSEC Environmental Inc.

Project: Kalama Chemical/ EKC-1021 **TestCode:** **8260_W**

Sample ID: **CCV1 40ppb**	SampType: **CCV**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **42290**
Client ID: **CCV**	Batch ID: **18654**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **10/14/2021**	SeqNo: **541956**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	39.4	0.300	40.00	0	98.5	80	120				
Toluene	39.9	1.00	40.00	0	99.7	80	120				

Sample ID: **MB**	SampType: **MBLK**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **42290**
Client ID: **PBW**	Batch ID: **18654**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **10/14/2021**	SeqNo: **541957**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.300									
Toluene	ND	1.00									
Surr: 1,2-Dichloroethane-d4	121		100.0		121	75.3	126				
Surr: 4-Bromofluorobenzene	98.4		100.0		98.4	78.1	120				
Surr: Dibromofluoromethane	122		100.0		122	74.2	122				
Surr: Toluene-d8	99.5		100.0		99.5	76.2	135				

Sample ID: **2110025-011AMS**	SampType: **MS**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **42290**
Client ID: **BatchQC**	Batch ID: **18654**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **10/14/2021**	SeqNo: **541973**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	53600	300	40000	0	134	74.1	136				
Toluene	43000	1000	40000	1870	103	68.4	135				

QC SUMMARY REPORT

Specialty Analytical

WO#: **2110059**

12/6/2021

Client: RSEC Environmental Inc.

Project: Kalama Chemical/ EKC-1021 **TestCode:** **8260_W**

Sample ID: **2110025-011AMS**	SampType: **MS**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **42290**
Client ID: **BatchQC**	Batch ID: **18654**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **10/14/2021**	SeqNo: **541973**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID: **LCS**	SampType: **LCS**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **42290**
Client ID: **LCSW**	Batch ID: **18654**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **10/14/2021**	SeqNo: **541974**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	39.4	0.300	40.00	0	98.5	76.8	125				
Toluene	39.9	1.00	40.00	0	99.7	82	122				

Sample ID: **CCV1 40ppb**	SampType: **CCV**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **42290**
Client ID: **CCV**	Batch ID: **18654**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **10/15/2021**	SeqNo: **541995**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Toluene	37.8	1.00	40.00	0	94.6	80	120				

Sample ID: **CCB**	SampType: **CCB**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **42290**
Client ID: **CCB**	Batch ID: **18654**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **10/15/2021**	SeqNo: **541997**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Toluene	ND	1.00									

QC SUMMARY REPORT

Specialty Analytical

WO#: **2110059**

12/6/2021

Client: RSEC Environmental Inc.

Project: Kalama Chemical/ EKC-1021 **TestCode:** **8260_W**

Sample ID: **CCB**	SampType: **CCB**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **42290**
Client ID: **CCB**	Batch ID: **18654**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **10/15/2021**	SeqNo: **541997**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	100		100.0		100	75.3	126				
Surr: 4-Bromofluorobenzene	97.8		100.0		97.8	78.1	120				
Surr: Dibromofluoromethane	101		100.0		101	74.2	122				
Surr: Toluene-d8	99.2		100.0		99.2	76.2	135				

Sample ID: **CCV1 40ppb**	SampType: **CCV**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **42292**
Client ID: **CCV**	Batch ID: **18654**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **10/15/2021**	SeqNo: **542163**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	38.2	0.300	40.00	0	95.6	80	120				
Toluene	37.8	1.00	40.00	0	94.6	80	120				

Sample ID: **MB-18654**	SampType: **MBLK**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **42292**
Client ID: **PBW**	Batch ID: **18654**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **10/15/2021**	SeqNo: **542165**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.300									
Toluene	ND	1.00									
Surr: 1,2-Dichloroethane-d4	100		100.0		100	75.3	126				
Surr: 4-Bromofluorobenzene	97.8		100.0		97.8	78.1	120				

QC SUMMARY REPORT

Specialty Analytical

WO#: **2110059**

12/6/2021

Client: RSEC Environmental Inc.

Project: Kalama Chemical/ EKC-1021 **TestCode:** **8260_W**

Sample ID: **MB-18654**	SampType: **MBLK**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **42292**
Client ID: **PBW**	Batch ID: **18654**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **10/15/2021**	SeqNo: **542165**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Dibromofluoromethane	101		100.0		101	74.2	122				
Surr: Toluene-d8	99.2		100.0		99.2	76.2	135				

Sample ID: **LCS 40ppb**	SampType: **LCS**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **42292**
Client ID: **LCSW**	Batch ID: **18654**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **10/15/2021**	SeqNo: **542166**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	38.2	0.300	40.00	0	95.6	76.8	125				
Toluene	37.8	1.00	40.00	0	94.6	82	122				

Sample ID: **2109242-002AMS**	SampType: **MS**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **42292**
Client ID: **BatchQC**	Batch ID: **18654**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **10/15/2021**	SeqNo: **542173**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	49.5	0.300	40.00	0	124	74.1	136				
Toluene	37.9	1.00	40.00	0	94.7	68.4	135				

QC SUMMARY REPORT

Specialty Analytical

WO#: **2110059**

12/6/2021

Client: RSEC Environmental Inc.

Project: Kalama Chemical/ EKC-1021 **TestCode:** **8260_W**

Sample ID: **CCV1 40ppb** SampType: **CCV** TestCode: **8260_W** Units: **µg/L** Prep Date: RunNo: **42328**

Client ID: **CCV** Batch ID: **18583** TestNo: **SW8260D** **SW 5030B** Analysis Date: **10/19/2021** SeqNo: **542453**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	39.2	0.300	40.00	0	97.9	80	120				
Toluene	40.6	1.00	40.00	0	101	80	120				

Sample ID: **MB** SampType: **MBLK** TestCode: **8260_W** Units: **µg/L** Prep Date: RunNo: **42328**

Client ID: **PBW** Batch ID: **18583** TestNo: **SW8260D** **SW 5030B** Analysis Date: **10/19/2021** SeqNo: **542454**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.300									
Toluene	ND	1.00									
Surr: 1,2-Dichloroethane-d4	127		100.0		127	75.3	126				S
Surr: 4-Bromofluorobenzene	97.6		100.0		97.6	78.1	120				
Surr: Dibromofluoromethane	128		100.0		128	74.2	122				S
Surr: Toluene-d8	103		100.0		103	76.2	135				

Sample ID: **2110059-014AMS** SampType: **MS** TestCode: **8260_W** Units: **µg/L** Prep Date: RunNo: **42328**

Client ID: **MW-97** Batch ID: **18583** TestNo: **SW8260D** **SW 5030B** Analysis Date: **10/19/2021** SeqNo: **542461**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	3750	30.0	4000	54.00	92.5	74.1	136				
Toluene	5330	100	4000	1904	85.6	68.4	135				

QC SUMMARY REPORT

Specialty Analytical

WO#: **2110059**

12/6/2021

Client: RSEC Environmental Inc.

Project: Kalama Chemical/ EKC-1021 **TestCode:** **8260_W**

Sample ID: **2110059-014AMS**	SampType: **MS**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **42328**
Client ID: **MW-97**	Batch ID: **18583**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **10/19/2021**	SeqNo: **542461**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID: **LCS 40ppb**	SampType: **LCS**	TestCode: **8260_W**	Units: **µg/L**	Prep Date:	RunNo: **42328**
Client ID: **LCSW**	Batch ID: **18583**	TestNo: **SW8260D**	**SW 5030B**	Analysis Date: **10/19/2021**	SeqNo: **542462**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	39.2	0.300	40.00	0	97.9	76.8	125				
Toluene	40.6	1.00	40.00	0	101	82	122				

QC SUMMARY REPORT

Specialty Analytical

WO#: **2110059**

12/6/2021

Client: RSEC Environmental Inc.

Project: Kalama Chemical/ EKC-1021 **TestCode:** **8270LL_W**

Sample ID: **LCS-18636**	SampType: **LCS**	TestCode: **8270LL_W**	Units: **µg/L**	Prep Date: **10/6/2021**	RunNo: **42603**
Client ID: **LCSW**	Batch ID: **18636**	TestNo: **SW8270E**	**SW 3510C**	Analysis Date: **11/10/2021**	SeqNo: **546528**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Bis(2-ethylhexyl)phthalate	37.2	0.500	40.00	0	93.1	50	130				
Diphenyl ether	36.7	0.500	40.00	0	91.8	50	130				

Sample ID: **LCSD-18636**	SampType: **LCSD**	TestCode: **8270LL_W**	Units: **µg/L**	Prep Date: **10/6/2021**	RunNo: **42603**
Client ID: **LCSS02**	Batch ID: **18636**	TestNo: **SW8270E**	**SW 3510C**	Analysis Date: **11/10/2021**	SeqNo: **546529**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Bis(2-ethylhexyl)phthalate	36.8	0.500	40.00	0	92.0	50	130	37.24	1.16	30	
Diphenyl ether	35.6	0.500	40.00	0	89.0	50	130	36.73	3.10	30	

Sample ID: **MB-18636**	SampType: **MBLK**	TestCode: **8270LL_W**	Units: **µg/L**	Prep Date: **10/6/2021**	RunNo: **42603**
Client ID: **PBW**	Batch ID: **18636**	TestNo: **SW8270E**	**SW 3510C**	Analysis Date: **11/10/2021**	SeqNo: **546530**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Bis(2-ethylhexyl)phthalate	ND	0.500									
Diphenyl ether	ND	0.500									
Surr: 2,4,6-Tribromophenol	84.3		100.0		84.3	33.1	129.7				
Surr: 2-Fluorobiphenyl	86.7		100.0		86.7	33.1	126.2				
Surr: 2-Fluorophenol	51.4		100.0		51.4	13.4	127.1				
Surr: 4-Terphenyl-d14	76.2		100.0		76.2	41	140				

QC SUMMARY REPORT

Specialty Analytical

WO#: **2110059**

12/6/2021

Client: RSEC Environmental Inc.

Project: Kalama Chemical/ EKC-1021 **TestCode:** **8270LL_W**

Sample ID: **MB-18636**	SampType: **MBLK**	TestCode: **8270LL_W**	Units: **µg/L**	Prep Date: **10/6/2021**	RunNo: **42603**
Client ID: **PBW**	Batch ID: **18636**	TestNo: **SW8270E**	**SW 3510C**	Analysis Date: **11/10/2021**	SeqNo: **546530**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Nitrobenzene-d5	79.2		100.0		79.2	28.9	129.9				
Surr: Phenol-d6	68.1		100.0		68.1	10.6	128.5				

Sample ID: **CCV**	SampType: **CCV**	TestCode: **8270LL_W**	Units: **µg/L**	Prep Date:	RunNo: **42603**
Client ID: **CCV**	Batch ID: **18636**	TestNo: **SW8270E**	**SW 3510C**	Analysis Date: **11/10/2021**	SeqNo: **546741**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Bis(2-ethylhexyl)phthalate	17.2	0.500	20.00	0	85.9	80	120				
Diphenyl ether	18.4	0.500	20.00	0	92.2	80	120				

Sample ID: **2111025-013AMS**	SampType: **MS**	TestCode: **8270LL_W**	Units: **µg/L**	Prep Date:	RunNo: **42603**
Client ID: **BatchQC**	Batch ID: **18636**	TestNo: **SW8270E**	**SW 3510C**	Analysis Date: **11/10/2021**	SeqNo: **546742**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Bis(2-ethylhexyl)phthalate	35.2	0.500	40.00	0	88.1	30	140				H
Diphenyl ether	33.5	0.500	40.00	100.5	-168	30	140				SH

QC SUMMARY REPORT

Specialty Analytical

WO#: **2110059**

12/6/2021

Client: RSEC Environmental Inc.

Project: Kalama Chemical/ EKC-1021 **TestCode:** **8270LL_W**

Sample ID: **2111025-013AMSD** SampType: **MSD** TestCode: **8270LL_W** Units: **µg/L** Prep Date: RunNo: **42603**

Client ID: **BatchQC** Batch ID: **18636** TestNo: **SW8270E** **SW 3510C** Analysis Date: **11/10/2021** SeqNo: **546743**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Bis(2-ethylhexyl)phthalate	36.2	0.500	40.00	0	90.5	30	140	35.24	2.72	30	H
Diphenyl ether	32.2	0.500	40.00	100.5	-171	30	140	33.46	3.90	30	SH

Specialty Analytical
9011 SE Jannsen Rd
Clackamas, Oregon 97015
TEL: 503-607-1331 FAX: 503-607-1336
Website: www.specialtyanalytical.com

Sample Receipt Checklist

Client Name RSEC Work Order Numbe 2110059

RcptNo: 1 Date and Time Receive 10/6/2021 2:54:37 PM Received by Mandy Wehe

Completed by Reviewed by:

Completed Date: 10/6/2021 Reviewed Date: 10/6/2021 4:32:47 PM

Carrier name SA

Chain of custody present?	Yes ☑	No ☐		
Chain of custody signed when relinquished and received?	Yes ☑	No ☐		
Chain of custody agrees with sample labels?	Yes ☑	No ☐	Not Presen	☐
Are matrices correctly identified on Chain of custody?	Yes ☑	No ☐		
Is it clear what analyses were requested?	Yes ☑	No ☐		
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Presen	☑
Samples in proper container/bottle?	Yes ☑	No ☐		
Were correct preservatives used and noted?	Yes ☑	No ☐	NA	☐
Sample containers intact?	Yes ☑	No ☐		
Sufficient sample volume for indicated test?	Yes ☑	No ☐		
Were container lables complete (ID, Pres, Date)?	Yes ☑	No ☐		
All samples received within holding time?	Yes ☑	No ☐		
Was an attempt made to cool the samples?	Yes ☑	No ☐	NA	☐
All samples received at a temp. of > 0° C to 6.0° C?	Yes ☑	No ☐	NA	☐
Response when temperature is outside of range:				
Preservative added to bottles:				
Sample Temp. taken and recorded upon receipt?	Yes ☑	No ☐	To	2.3 º
Water - Were bubbles absent in VOC vials?	Yes ☐	No ☐	No Vials	☑
Water - Was there Chlorine Present?	Yes ☐	No ☐	NA	☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	NA	☐
Are Samples considered acceptable?	Yes ☑	No ☐		
Custody Seals present?	Yes ☑	No ☐		
Traffic Report or Packing Lists present?	Yes ☐	No ☑		
Airbill or Sticker?	Air Bill ☐	Sticker ☐	Not Present	☑
Airbill No:				
Sample Tags Present?	Yes ☐	No ☑		
Sample Tags Listed on COC?	Yes ☐	No ☑		
Tag Numbers:				
Sample Condition?	Intact ☑	Broken ☐	Leaking	☐

Case Number: SDG: SAS:

Adjusted? _____ Checked b

Any No and/or NA (not applicable) response must be detailed in the comments section be

Specialty Analytical
9011 SE Jannsen Rd
Clackamas, Oregon 97015
TEL: 503-607-1331 FAX: 503-607-1336
Website: www.specialtyanalytical.com

Sample Receipt Checklist

Client Contacted? ☐ Yes ☑ No ☐ NA Person Contacted: Comments:

Contact Mode: ☐ Phone: ☐ Fax: ☐ Email: ☐ In Person:

Client Instructions:

Date Contacted: Contacted By:

Regarding:

CorrectiveAction:

Specialty Analytical
9011 SE Jannsen Rd
Clackamas, OR 97015
Phone: 503-607-1331
Fax: 503-607-1336

Chain of Custody Record

Date: | Page: of:

Project Name: Kalama Chemical

Project No: EKC-1021 PO No: EKC-1021

Collected by: RT

State Collected: OR (WA) OTHER

Report To (PM): richa@rsecinc.com

PM Email:

Laboratory Project No (internal): 2110059

Temperature on Receipt: 2.3 °C

Cooling: ice Shipped Via: SA

Custody Seal: (Y) / N Intact / Broken (Cooler) / Bottle

MDL TIER IV EDD

Sample Disposal: ☐ Return to client ☒ Disposal by lab (after 60 days)

Client: RSEC Environmental

Address: 958 Hood View Ct

City, State, Zip: Hood River, OR 97031

Telephone: 541-490-4223

AP Email: richa@rsecinc.com

	Sample Name	Sample Date	Sample Time	Sample Matrix*	# of Containers	Requested Tests: 8270 DPO	8260 BTEX	8270 DPO+ biphenyl + bis(2-ethylhexyl)phthalate (DEHP)										Comments
1	MW-256	10/4	1200	GW	1	X												
2	MW-245	10/4	1750	GW	1	X												
3	KC-9	10/4	1640	GW	4	X	X											
4	PDW-117	10/4	1600	GW	4	X	X											
5	MW-231	10/6	0850	GW	4	X	X											
6	MW-230	10/6	0955	GW	4	X	X											
7	PZ-104	10/4	1845	GW	4		X	X	X	X								
8	PZ-107	10/4	1945	GW	4		X	X	X	X								
9	PZ-401	10/4	1700	GW	4		X	X	X	X								
10	USRW-2	10/6	1055	GW	1	X												

*Matrix: A = Air, AQ = Aqueous, L=Liquid, O = Oil, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water, M = Miscellaneous

Turn-around Time: Standard (5-7 Business): X 3 Day: _____ 2 Day: _____ Next Day: _____ Same Day: _____

Expedited turn-around requests should be coordinated in advance

Relinquished	Date/Time	Received	Date/Time
x	10/6 1330 EKC G-to	x	10-6-21 1330
x	10-6-21 1435	x	10/6/21 1435
x		x	

Specialty Analytical
9011 SE Jannsen Rd
Clackamas, OR 97015
Phone: 503-607-1331
Fax: 503-607-1336

Chain of Custody Record

Date:
Page: of:
Project Name: Kalama Chemical
Project No: EKC-1021 PO No: EKC1021
Collected by: RT
State Collected: OR (WA) OTHER
Report To (PM): rich@rsrcinc.com
PM Email:

Laboratory Project No (internal): 2110059
Temperature on Receipt: 2.1 °C
Cooling: ice Shipped Via: SA
Custody Seal: (Y) / N (Intact) / Broken (Cooler) / Bottle
MDL TIER IV EDD
Sample Disposal: ☐ Return to client ☒ Disposal by lab (after 60 days)

Client: RSRC Environmental
Address: 958 Hoodview Ct
City, State, Zip: Hood River, OR 97031
Telephone: 541-490-4223
AP Email: rich@rsrcinc.com

	Sample Name	Sample Date	Sample Time	Sample Matrix*	# of Containers	Requested Tests: 8260 B+T	Comments
1	KC-14	10/6	1220	GW	3	X	
2	MW-239	10/6	1250	GW	3	X	
3	MW-243	10/6	1130	"	"	X	
4	MW-97	10/6	1100	"	"	X	
5	MW-250	10/6	1315	"	"	X	
6							
7							
8							
9							
10							

*Matrix: A = Air, AQ = Aqueous, L=Liquid, O = Oil, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water, M = Miscellaneous

Turn-around Time: Standard (5-7 Business): X 3 Day: _____ 2 Day: _____ Next Day: _____ Same Day: _____
Expedited turn-around requests should be coordinated in advance

Relinquished	Date/Time	Received	Date/Time
x	10/6 1330 EKC Cooler	x	10-6-21 1330
x	10-6-21 1435	x	10/6/21 1435
x		x	

January 2022 Quarterly ISRW Laboratory Reports

ALS Laboratory

February 09, 2022 Service Request No:K2200555

Rich Truax
RSEC Inc
958 Hood View Ct.
Hood River, OR 97031

Laboratory Results for: Lanxess Kalama

Dear Rich,

Enclosed are the results of the sample(s) submitted to our laboratory January 18, 2022
For your reference, these analyses have been assigned our service request number **K2200555.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3364. You may also contact me via email at howard.holmes@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Howard Holmes
Project Manager

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626
PHONE +1 360 577 7222 | FAX +1 360 636 1068
ALS Group USA, Corp.
dba ALS Environmental

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

Client: RSEC Inc
Project: Lanxess Kalama
Sample Matrix: Water

Service Request: K2200555
Date Received: 01/18/2022

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

Sample Receipt:

Twelve water samples were received for analysis at ALS Environmental on 01/18/2022. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Volatiles by GC/MS:

Method 8260C, 01/25/2022:Samples required dilution due to the presence of elevated levels of target analyte. The reporting limits are adjusted to reflect the dilution.

Approved by _____ Date 02/09/2022

SAMPLE DETECTION SUMMARY

CLIENT ID: ISRW-1			Lab ID: K2200555-001			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Toluene	30000			500	ug/L	8260C

CLIENT ID: ISRW-2			Lab ID: K2200555-002			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Benzene	69			50	ug/L	8260C
Toluene	37000			1000	ug/L	8260C

CLIENT ID: ISRW-3			Lab ID: K2200555-003			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Benzene	150			100	ug/L	8260C
Toluene	100000			1300	ug/L	8260C

CLIENT ID: ISRW-4			Lab ID: K2200555-004			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Benzene	10			10	ug/L	8260C
Toluene	3800			100	ug/L	8260C

CLIENT ID: ISRW-5			Lab ID: K2200555-005			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Toluene	78000			1300	ug/L	8260C

CLIENT ID: ISRW-6			Lab ID: K2200555-006			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Benzene	46			25	ug/L	8260C
Toluene	18000			500	ug/L	8260C

CLIENT ID: ISRW-7			Lab ID: K2200555-007			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Toluene	0.66			0.50	ug/L	8260C

CLIENT ID: ISRW-8			Lab ID: K2200555-008			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Benzene	77			50	ug/L	8260C
Toluene	45000			1000	ug/L	8260C

CLIENT ID: ISRW-9			Lab ID: K2200555-009			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Toluene	17000			500	ug/L	8260C

CLIENT ID: ISRW-10			Lab ID: K2200555-010			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Benzene	110			100	ug/L	8260C
Toluene	47000			1000	ug/L	8260C

SAMPLE DETECTION SUMMARY

CLIENT ID: ISRW-11			Lab ID: K2200555-011			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Toluene	32000			500	ug/L	8260C

CHAIN OF CUSTODY

1317 South 13th Ave., Kelso, WA 98626 | +1 360 577 7222 | +1 800 695 7222 | +1 360 636 1068 (fax)

PAGE 1 OF 2 SR# L2200555 COC#

PROJECT NAME: Laxess Kalama
PROJECT NUMBER: LKC-0122
PROJECT MANAGER: Rich Trujax
COMPANY NAME: RSEC Environmental
ADDRESS: 958 Hood View Ct.
CITY/STATE/ZIP: Hood River OR 97031
E-MAIL ADDRESS: richa@rsecinc.com
PHONE #: 541-490-4223 FAX #:
SAMPLER'S SIGNATURE:

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Semivolatile Organics by GC/MS 625☐ 8270☐ 8270LL☐ SIM PAH☐	Volatile Organics 624☐ 8260X	Hydrocarbons (*see below) Gas☐ Diesel☐ Oil☐ 8021☐ BTEX☐	Oil & Grease/TRPH 1664 HEM☐ 1664 SGT☐	PCBs Aroclors☐ Congeners☐	Pesticides/Herbicides 608☐ 8081☐ 8141☐ 8151☐	Chlorophenolics - 8151M Tri☐ Tetra☐ PCP☐	Metals, Total or Dissolved (See List below)	Cyanide☐ Hex-Chrom☐	(circle) pH, Cond., Cl, SO_4, PO_4, F, NO_2, NO_3, BOD, TSS, TDS, Turb.	(circle) NH_3-N, COD, TKN, TOC, DOC, NO_2+NO_3, T-Phos	TOX 9020☐ AOX 1650☐ 506☐	Alkalinity☐ CO_3☐ HCO_3☐	Dioxins/Furans 1613☐ 8290☐	Dissolved Gases RSK 175☐ CO_2☐ Methane☐ Ethane☐ Ethene☐	REMARKS
ISRW-1	1/18/22	0900		GW	3		X															
ISRW-2		0915																				
ISRW-3		0930																				
ISRW-4		0945																				
ISRW-5		1000																				
ISRW-6		1015																				
ISRW-7		1030																				
ISRW-8		1045																				
ISRW-9		1100																				
ISRW-10		1115																				

REPORT REQUIREMENTS

X I. Routine Report: Method Blank, Surrogate, as required
___ II. Report Dup., MS, MSD as required
___ III. CLP Like Summary (no raw data)
___ IV. Data Validation Report
___ V. EDD

INVOICE INFORMATION

P.O. # LKC-0122
Bill To: RSEC
richa@rsecinc.com

TURNAROUND REQUIREMENTS

___ 24 hr. ___ 48 hr.
___ 5 day
X Standard (15 working days)
___ Provide FAX Results
___ Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg
Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER: ___ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:

* Benzene + Toluene Only - All Samples

Container Supply Number
119665

☐ Sample Shipment contains USDA regulated soil samples (check box if applicable)

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature	Signature	Signature	Signature
Date/Time	Date/Time 1-19-22 1510	Date/Time	Date/Time
Printed Name: Rich Trujax	Printed Name: Lois Hollander	Printed Name	Printed Name
Firm: RSEC	Firm: ALS	Firm	Firm

CHAIN OF CUSTODY

1317 South 13th Ave., Kelso, WA 98626 | +1 360 577 7222 | +1 800 695 7222 | +1 360 636 1068 (fax)

PAGE 2 OF 2 SR# KZ200555 COC#

PROJECT NAME: Lanxess Kalama
PROJECT NUMBER: LKC-0122
PROJECT MANAGER: Rich Trulx
COMPANY NAME: RSEC Environmental
ADDRESS: 958 Hood View Ct.
CITY/STATE/ZIP: Hood River, OR 97031
E-MAIL ADDRESS: richa@rseceinc.com
PHONE # 541-490-4223 FAX #
SAMPLER'S SIGNATURE:

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Semivolatile Organics by GC/MS 625☐ 8270☐ SIM PAH☐	Volatile Organics 624☐ 8270LL☐ 8260☐ 8021☐ BTEX☐	Hydrocarbons (*see below) Gas☐ Diesel☐ Oil☐	Oil & Grease/TRPH 1664 HEM☐ 1664 SGT☐	PCBs Aroclors☐ Congeners☐	Pesticides/Herbicides 608☐ 8081☐ 8141☐ 8151☐	Chlorophenolics - 8151M Tri☐ Tetra☐ PCP☐	Metals, Total or Dissolved (See List below)	Cyanide☐ Hex-Chrom☐	(circle) pH, Cond., Cl, SO4, PO4, F, NO2, NO3, BOD, TSS, TDS, Turb.	(circle) NH3-N, COD, TKN, TOC, DOC, NO2+NO3, T-Phos	TOX 9020☐ AOX 1650☐ 506☐	Alkalinity☐ CO3☐ HCO3☐	Dioxins/Furans 1613☐ 8290☐	Dissolved Gases RSK 175☐ Methane☐ Ethane☐ Ethene☐ CO2☐	REMARKS
I5RW-11	1/18/22	1130		GW	3		X														

REPORT REQUIREMENTS

X I. Routine Report: Method Blank, Surrogate, as required
___ II. Report Dup., MS, MSD as required
___ III. CLP Like Summary (no raw data)
___ IV. Data Validation Report
___ V. EDD

INVOICE INFORMATION

P.O. # LKC-0122
Bill To: RSEC
richa@rseceinc.com

TURNAROUND REQUIREMENTS

___ 24 hr. ___ 48 hr.
X 5 day
X Standard (15 working days)
___ Provide FAX Results

Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER: ___ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:

* Benzene/Toluene Only - All Samples

Container Supply Number

119665

☐ Sample Shipment contains USDA regulated soil samples (check box if applicable)

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature	Signature	Signature	Signature
Date/Time	Date/Time 1-18-22 1540	Date/Time	Date/Time
Printed Name Rich Trulx	Printed Name Isiz Hollander	Printed Name	Printed Name
Firm RSEC	Firm ALS	Firm	Firm

PM HH

Cooler Receipt and Preservation Form

Client RSEC Service Request K22 00555

Received: 1-18-22 Opened: 1-18-22 By: ZH Unloaded: 1-18-22 By: ZH

1. Samples were received via? USPS Fed Ex UPS DHL PDX Courier **Hand Delivered** (circled)
2. Samples were received in: (circle) **Cooler** (circled) Box Envelope Other ___ NA
3. Were custody seals on coolers? NA **Y** (circled) N If yes, how many and where? 1 front
   If present, were custody seals intact? **Y** (circled) N If present, were they signed and dated? **Y** (circled) N

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA (NA circled)	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number / NA (NA circled)	Filed
3.5		1R01					

4. Was a Temperature Blank present in cooler? NA **Y** (circled) N If yes, notate the temperature in the appropriate column above:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA **Y** (circled) N
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. **NA** (circled) Y N

If applicable, tissue samples were received: Frozen Partially Thawed Thawed

6. Packing material: **Inserts** (circled) **Baggies** (circled) **Bubble Wrap** (circled) Gel Packs **Wet Ice** (circled) Dry Ice Sleeves ___
7. Were custody papers properly filled out (ink, signed, etc.)? NA **Y** (circled) N
8. Were samples received in good condition (unbroken) NA **Y** (circled) N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA **Y** (circled) N
10. Did all sample labels and tags agree with custody papers? NA ~~Y~~ **N** (circled)
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA **Y** (circled) N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* **NA** (circled) Y N
13. Were VOA vials received without headspace? *Indicate in the table below.* NA **Y** (circled) N
14. Was C12/Res negative? **NA** (circled) Y N
15. Were 100ml sterile microbiology bottles filled exactly to the 100ml mark? **NA** (circled) Y N Under filled Overfilled

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, Resolutions: Rec'd 2 trip blanks not on COC.

:

1/13/22

Page ___ of ___

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2200555
Project:	Lanxess Kalama/LKC-0122	**Date Collected:**	01/18/22 09:00
Sample Matrix:	Water	**Date Received:**	01/18/22 15:40
Sample Name:	ISRW-1	**Units:**	ug/L
Lab Code:	K2200555-001	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	ND U	50	100	01/20/22 20:47	
Toluene	**30000**	500	1000	01/20/22 20:20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	68	68 - 117	01/20/22 20:47	
Dibromofluoromethane	106	73 - 122	01/20/22 20:47	
Toluene-d8	99	65 - 144	01/20/22 20:47	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2200555
Project:	Lanxess Kalama/LKC-0122	**Date Collected:**	01/18/22 09:15
Sample Matrix:	Water	**Date Received:**	01/18/22 15:40
Sample Name:	ISRW-2	**Units:**	ug/L
Lab Code:	K2200555-002	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	**69**	50	100	01/25/22 20:16	
Toluene	**37000**	1000	2000	01/25/22 16:18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	79	68 - 117	01/25/22 20:16	
Dibromofluoromethane	100	73 - 122	01/25/22 20:16	
Toluene-d8	97	65 - 144	01/25/22 20:16	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2200555
Project:	Lanxess Kalama/LKC-0122	**Date Collected:**	01/18/22 09:30
Sample Matrix:	Water	**Date Received:**	01/18/22 15:40
Sample Name:	ISRW-3	**Units:**	ug/L
Lab Code:	K2200555-003	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	**150**	100	200	01/25/22 20:43	
Toluene	**100000**	1300	2500	01/25/22 16:45	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	80	68 - 117	01/25/22 20:43	
Dibromofluoromethane	95	73 - 122	01/25/22 20:43	
Toluene-d8	111	65 - 144	01/25/22 20:43	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2200555
Project:	Lanxess Kalama/LKC-0122	**Date Collected:**	01/18/22 09:45
Sample Matrix:	Water	**Date Received:**	01/18/22 15:40
Sample Name:	ISRW-4	**Units:**	ug/L
Lab Code:	K2200555-004	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	**10**	10	20	01/25/22 21:09	
Toluene	**3800**	100	200	01/25/22 17:11	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	76	68 - 117	01/25/22 21:09	
Dibromofluoromethane	97	73 - 122	01/25/22 21:09	
Toluene-d8	118	65 - 144	01/25/22 21:09	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2200555
Project:	Lanxess Kalama/LKC-0122	**Date Collected:**	01/18/22 10:00
Sample Matrix:	Water	**Date Received:**	01/18/22 15:40
Sample Name:	ISRW-5	**Units:**	ug/L
Lab Code:	K2200555-005	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	ND U	100	200	01/25/22 21:36	
Toluene	**78000**	1300	2500	01/25/22 17:37	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	77	68 - 117	01/25/22 21:36	
Dibromofluoromethane	100	73 - 122	01/25/22 21:36	
Toluene-d8	98	65 - 144	01/25/22 21:36	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2200555
Project:	Lanxess Kalama/LKC-0122	**Date Collected:**	01/18/22 10:15
Sample Matrix:	Water	**Date Received:**	01/18/22 15:40
Sample Name:	ISRW-6	**Units:**	ug/L
Lab Code:	K2200555-006	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	**46**	25	50	01/25/22 22:02	
Toluene	**18000**	500	1000	01/25/22 18:04	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	77	68 - 117	01/25/22 22:02	
Dibromofluoromethane	97	73 - 122	01/25/22 22:02	
Toluene-d8	106	65 - 144	01/25/22 22:02	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2200555
Project:	Lanxess Kalama/LKC-0122	**Date Collected:**	01/18/22 10:30
Sample Matrix:	Water	**Date Received:**	01/18/22 15:40
Sample Name:	ISRW-7	**Units:**	ug/L
Lab Code:	K2200555-007	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	ND U	0.50	1	01/25/22 15:52	
Toluene	**0.66**	0.50	1	01/25/22 15:52	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	68	68 - 117	01/25/22 15:52	
Dibromofluoromethane	110	73 - 122	01/25/22 15:52	
Toluene-d8	108	65 - 144	01/25/22 15:52	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2200555
Project:	Lanxess Kalama/LKC-0122	**Date Collected:**	01/18/22 10:45
Sample Matrix:	Water	**Date Received:**	01/18/22 15:40
Sample Name:	ISRW-8	**Units:**	ug/L
Lab Code:	K2200555-008	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	**77**	50	100	01/25/22 22:28	
Toluene	**45000**	1000	2000	01/25/22 18:30	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	73	68 - 117	01/25/22 22:28	
Dibromofluoromethane	98	73 - 122	01/25/22 22:28	
Toluene-d8	106	65 - 144	01/25/22 22:28	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2200555
Project:	Lanxess Kalama/LKC-0122	**Date Collected:**	01/18/22 11:00
Sample Matrix:	Water	**Date Received:**	01/18/22 15:40
Sample Name:	ISRW-9	**Units:**	ug/L
Lab Code:	K2200555-009	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	ND U	25	50	01/25/22 22:54	
Toluene	**17000**	500	1000	01/25/22 18:57	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	76	68 - 117	01/25/22 22:54	
Dibromofluoromethane	97	73 - 122	01/25/22 22:54	
Toluene-d8	99	65 - 144	01/25/22 22:54	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2200555
Project:	Lanxess Kalama/LKC-0122	**Date Collected:**	01/18/22 11:15
Sample Matrix:	Water	**Date Received:**	01/18/22 15:40
Sample Name:	ISRW-10	**Units:**	ug/L
Lab Code:	K2200555-010	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	**110**	100	200	01/25/22 23:21	
Toluene	**47000**	1000	2000	01/25/22 19:23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	87	68 - 117	01/25/22 23:21	
Dibromofluoromethane	95	73 - 122	01/25/22 23:21	
Toluene-d8	97	65 - 144	01/25/22 23:21	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2200555
Project:	Lanxess Kalama/LKC-0122	**Date Collected:**	01/18/22 11:30
Sample Matrix:	Water	**Date Received:**	01/18/22 15:40
Sample Name:	ISRW-11	**Units:**	ug/L
Lab Code:	K2200555-011	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	ND U	50	100	01/25/22 23:47	
Toluene	**32000**	500	1000	01/25/22 19:50	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	86	68 - 117	01/25/22 23:47	
Dibromofluoromethane	97	73 - 122	01/25/22 23:47	
Toluene-d8	102	65 - 144	01/25/22 23:47	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2200555
Project:	Lanxess Kalama/LKC-0122	**Date Collected:**	01/18/22
Sample Matrix:	Water	**Date Received:**	01/18/22 15:40
Sample Name:	Trip Blank	**Units:**	ug/L
Lab Code:	K2200555-012	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	ND U	0.50	1	01/28/22 19:48	
Toluene	ND U	0.50	1	01/28/22 19:48	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	82	68 - 117	01/28/22 19:48	
Dibromofluoromethane	97	73 - 122	01/28/22 19:48	
Toluene-d8	104	65 - 144	01/28/22 19:48	

Client: RSEC Inc **Service Request:** K2200555
Project: Lanxess Kalama/LKC-0122
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY
Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Extraction Method: None

Sample Name	Lab Code	4-Bromofluorobenzene 68-117	Dibromofluoromethane 73-122	Toluene-d8 65-144
ISRW-1	K2200555-001	68	106	99
ISRW-2	K2200555-002	79	100	97
ISRW-3	K2200555-003	80	95	111
ISRW-4	K2200555-004	76	97	118
ISRW-5	K2200555-005	77	100	98
ISRW-6	K2200555-006	77	97	106
ISRW-7	K2200555-007	68	110	108
ISRW-8	K2200555-008	73	98	106
ISRW-9	K2200555-009	76	97	99
ISRW-10	K2200555-010	87	95	97
ISRW-11	K2200555-011	86	97	102
Trip Blank	K2200555-012	82	97	104
Method Blank	KQ2201114-05	80	103	122
Method Blank	KQ2201665-05	81	101	101
Method Blank	KQ2202087-05	74	106	111
Lab Control Sample	KQ2201114-03	85	94	108
Duplicate Lab Control Sample	KQ2201114-04	95	93	101
Lab Control Sample	KQ2201665-03	93	98	103
Duplicate Lab Control Sample	KQ2201665-04	87	104	106
Lab Control Sample	KQ2202087-03	80	103	97
Duplicate Lab Control Sample	KQ2202087-04	99	94	105

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2200555
Project:	Lanxess Kalama/LKC-0122	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KQ2201114-05	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	ND U	0.50	1	01/20/22 12:23	
Toluene	ND U	0.50	1	01/20/22 12:23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	80	68 - 117	01/20/22 12:23	
Dibromofluoromethane	103	73 - 122	01/20/22 12:23	
Toluene-d8	122	65 - 144	01/20/22 12:23	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2200555
Project:	Lanxess Kalama/LKC-0122	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KQ2201665-05	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	ND U	0.50	1	01/28/22 15:23	
Toluene	ND U	0.50	1	01/28/22 15:23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	81	68 - 117	01/28/22 15:23	
Dibromofluoromethane	101	73 - 122	01/28/22 15:23	
Toluene-d8	101	65 - 144	01/28/22 15:23	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2200555
Project:	Lanxess Kalama/LKC-0122	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KQ2202087-05	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	ND U	0.50	1	01/25/22 15:25	
Toluene	ND U	0.50	1	01/25/22 15:25	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	74	68 - 117	01/25/22 15:25	
Dibromofluoromethane	106	73 - 122	01/25/22 15:25	
Toluene-d8	111	65 - 144	01/25/22 15:25	

Client:	RSEC Inc	**Service Request:**	K2200555
Project:	Lanxess Kalama/LKC-0122	**Date Analyzed:**	01/20/22
Sample Matrix:	Water	**Date Extracted:**	NA

Duplicate Lab Control Sample Summary
Volatile Organic Compounds by GC/MS

Analysis Method:	8260C	**Units:**	ug/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	752212

	Lab Control Sample KQ2201114-03			Duplicate Lab Control Sample KQ2201114-04					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Benzene	10.1	10.0	101	9.78	10.0	98	69-124	3	30
Toluene	10.3	10.0	103	9.80	10.0	98	69-124	4	30

Client:	RSEC Inc	**Service Request:**	K2200555
Project:	Lanxess Kalama/LKC-0122	**Date Analyzed:**	01/28/22
Sample Matrix:	Water	**Date Extracted:**	NA

Duplicate Lab Control Sample Summary
Volatile Organic Compounds by GC/MS

Analysis Method:	8260C	**Units:**	ug/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	753051

	Lab Control Sample KQ2201665-03			Duplicate Lab Control Sample KQ2201665-04					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Benzene	9.72	10.0	97	9.51	10.0	95	69-124	2	30
Toluene	10.3	10.0	103	10.1	10.0	101	69-124	2	30

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	RSEC Inc	**Service Request:**	K2200555
Project:	Lanxess Kalama/LKC-0122	**Date Analyzed:**	01/25/22
Sample Matrix:	Water	**Date Extracted:**	NA

Duplicate Lab Control Sample Summary
Volatile Organic Compounds by GC/MS

Analysis Method:	8260C	**Units:**	ug/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	752651

	Lab Control Sample KQ2202087-03			Duplicate Lab Control Sample KQ2202087-04					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Benzene	10.9	10.0	109	10.1	10.0	101	69-124	8	30
Toluene	10.5	10.0	105	10.2	10.0	102	69-124	3	30

April 2022 Semi-Annual Data Set Laboratory Report

ALS Laboratory

May 09, 2022 Service Request No:K2204273

Rich Truax
RSEC Inc
958 Hood View Ct.
Hood River, OR 97031

Laboratory Results for: Lanxess Kalama Chemical

Dear Rich,

Enclosed are the results of the sample(s) submitted to our laboratory April 21, 2022
For your reference, these analyses have been assigned our service request number **K2204273.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3364. You may also contact me via email at howard.holmes@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Howard Holmes
Project Manager

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626
PHONE +1 360 577 7222 | FAX +1 360 636 1068
ALS Group USA, Corp.
dba ALS Environmental

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

Client: RSEC Inc
Project: Lanxess Kalama Chemical
Sample Matrix: Ground Water

Service Request: K2204273
Date Received: 04/21/2022

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

Sample Receipt:

Seven ground water samples were received for analysis at ALS Environmental on 04/21/2022. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Semivolatiles by GC/MS:

Method 8270D, 05/09/2022:Some samples required dilution due to the presence of elevated levels of target analyte. The reporting limits are adjusted to reflect the dilution.

Volatiles by GC/MS:

No significant anomalies were noted with this analysis.

Approved by _____ Date 05/09/2022

SAMPLE DETECTION SUMMARY

This form includes only detections above the reporting levels. For a full listing of sample results, continue to the Sample Results section of this Report.

CLIENT ID: PZ-107			Lab ID: K2204273-001			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Biphenyl	17			0.94	ug/L	8270D
Diphenyl Ether	64			1.0	ug/L	8270D

CLIENT ID: PZ-104			Lab ID: K2204273-002			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Benzene	1.7			0.50	ug/L	8260C
Biphenyl	54			0.94	ug/L	8270D
Diphenyl Ether	3300			20	ug/L	8270D

CLIENT ID: MW-401			Lab ID: K2204273-003			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Benzene	1.6			0.50	ug/L	8260C
Biphenyl	44			0.94	ug/L	8270D
Diphenyl Ether	2900			20	ug/L	8270D

CLIENT ID: MW-230			Lab ID: K2204273-004			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Diphenyl Ether	110			1.0	ug/L	8270D

CLIENT ID: MW-231			Lab ID: K2204273-005			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Benzene	0.56			0.50	ug/L	8260C
Diphenyl Ether	45			1.0	ug/L	8270D

CLIENT ID: MW-245			Lab ID: K2204273-006			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Diphenyl Ether	97			1.0	ug/L	8270D

CLIENT ID: MW-256			Lab ID: K2204273-007			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Diphenyl Ether	14			1.0	ug/L	8270D

CHAIN OF CUSTODY

ALS Environmental

1317 South 13th Ave., Kelso, WA 98626 | +1 360 577 7222 | +1 800 695 7222 | +1 360 636 1068 (fax)

SR# K2204273

PAGE ______ OF ______ COC# ______

PROJECT NAME: Lanxess Kalama
PROJECT NUMBER: LKC-0422
PROJECT MANAGER: Rich Truax
COMPANY NAME: RSEC
ADDRESS: 958 Hood View Ct.
CITY/STATE/ZIP: Hood River, OR 97031
E-MAIL ADDRESS: rich@rsecinc.com
PHONE #: 541-490-4223 FAX #:
SAMPLER'S SIGNATURE: [signature]

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Semivolatile Organics by GC/MS 625☐ 8270☒ 8270LL☐ SIM PAH☐	Volatile Organics 624☐ 8260☒ 8021☐ BTEX☐	Hydrocarbons (*see below) Gas☐ Diesel☐ Oil☐	Oil & Grease/TRPH 1664 HEM☐ 1664 SGT☐	PCBs Aroclors☐ Congeners☐	Pesticides/Herbicides 608☐ 8081☐ 8141☐ 8151☐	Chlorophenolics - 8151M Tri☐ Tetra☐ PCP☐	Metals, Total or Dissolved (See List below)	Cyanide☐ Hex-Chrom☐	(circle) pH, Cond., Cl, SO4, PO4, F, NO2, NO3, BOD, TSS, TDS, Turb.	(circle) NH3-N, COD, TKN, TOC, DOC, NO2+NO3, T-Phos	TOX 9020☐ AOX 1650☐ 506☐	Alkalinity☐ CO3☐ HCO3☐	Dioxins/Furans 1613☐ 8290☐	Dissolved Gases RSK 175☐ Methane☐ Ethane☐ Ethene☐ CO2☐			REMARKS
PZ-107	4/20	0900		GW	5	X	X																All 3-8270 constits.
PZ-104	4/20	0945		GW	5	X	X																— " —
MW-401	4/20	1015		GW	5	X	X																— " —
MW-230	4/20	1100		GW	5	X	X																*DPO only*
MW-230	4/20	1145		GW	5	X	X																*DPO only*
MW-245	4/20	1230		GW	2	X																	*DPO ONLY*
MW-256	4/20	1315		GW	2	X																	*DPO ONLY*

* All Collected 4/21/22

No analysis for TB/Trip Blanks if Present

REPORT REQUIREMENTS

X I. Routine Report: Method Blank, Surrogate, as required

__ II. Report Dup., MS, MSD as required

__ III. CLP Like Summary (no raw data)

__ IV. Data Validation Report

__ V. EDD

INVOICE INFORMATION

P.O. # LKC-0422

Bill To: rich@rsecinc.com

TURNAROUND REQUIREMENTS

__ 24 hr. __ 48 hr.

__ 5 day

X Standard (15 working days)

__ Provide FAX Results

Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

***INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER: ______ (CIRCLE ONE)**

SPECIAL INSTRUCTIONS/COMMENTS:

8260: Benzene (<1.2 ug/L) + toluene

8270: biphenyl, bis(2-ethylhexyl)phthalate, diphenyl oxide (DPO)

* PER Remarks

Container Supply Number

123051

☐ Sample Shipment contains USDA regulated soil samples (check box if applicable)

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature: [signature] Date/Time: 4/21/22	Signature: [signature] Date/Time: 4/21/22 1630	Signature Date/Time	Signature Date/Time
Printed Name: R Truax Firm: RSEC	Printed Name: [illegible] Firm: ALS	Printed Name Firm	Printed Name Firm

PM MM

Cooler Receipt and Preservation Form

Client Lancaster Service Request K22 04273

Received: 4/21/22 Opened: 4/21/22 By: [signature] Unloaded: 4/21/22 By: [signature]

1. Samples were received via? *USPS* *Fed Ex* *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) *Cooler* *Box* *Envelope* *Other*_____ *NA*
3. Were custody seals on coolers? NA Y N If yes, how many and where? _____
   If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
9.3		IR01	123051				
5.3		"					

4. Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column above:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA Y N
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA Y N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

6. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* _____
7. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
8. Were samples received in good condition (unbroken) NA Y N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N
10. Did all sample labels and tags agree with custody papers? NA Y N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
13. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
14. Was C12/Res negative? ~~NA~~ Y N
15. Were 100ml sterile microbiology bottles filled exactly to the 100ml mark? NA Y N Under filled Overfilled

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, Resolutions: _____

1/13/22

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2204273
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/21/22 09:00
Sample Matrix:	Ground Water	**Date Received:**	04/21/22 16:30
Sample Name:	PZ-107	**Units:**	ug/L
Lab Code:	K2204273-001	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	ND U	0.50	1	04/22/22 18:58	
Toluene	ND U	0.50	1	04/22/22 18:58	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	88	68 - 117	04/22/22 18:58	
Dibromofluoromethane	101	73 - 122	04/22/22 18:58	
Toluene-d8	98	65 - 144	04/22/22 18:58	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2204273
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/21/22 09:45
Sample Matrix:	Ground Water	**Date Received:**	04/21/22 16:30
Sample Name:	PZ-104	**Units:**	ug/L
Lab Code:	K2204273-002	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	**1.7**	0.50	1	04/22/22 19:23	
Toluene	ND U	0.50	1	04/22/22 19:23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	90	68 - 117	04/22/22 19:23	
Dibromofluoromethane	100	73 - 122	04/22/22 19:23	
Toluene-d8	98	65 - 144	04/22/22 19:23	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2204273
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/21/22 10:15
Sample Matrix:	Ground Water	**Date Received:**	04/21/22 16:30
Sample Name:	MW-401	**Units:**	ug/L
Lab Code:	K2204273-003	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	**1.6**	0.50	1	04/22/22 19:48	
Toluene	ND U	0.50	1	04/22/22 19:48	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	89	68 - 117	04/22/22 19:48	
Dibromofluoromethane	100	73 - 122	04/22/22 19:48	
Toluene-d8	97	65 - 144	04/22/22 19:48	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2204273
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/21/22 11:00
Sample Matrix:	Ground Water	**Date Received:**	04/21/22 16:30
Sample Name:	MW-230	**Units:**	ug/L
Lab Code:	K2204273-004	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	ND U	0.50	1	04/22/22 20:12	
Toluene	ND U	0.50	1	04/22/22 20:12	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	88	68 - 117	04/22/22 20:12	
Dibromofluoromethane	101	73 - 122	04/22/22 20:12	
Toluene-d8	98	65 - 144	04/22/22 20:12	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2204273
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/21/22 11:45
Sample Matrix:	Ground Water	**Date Received:**	04/21/22 16:30
Sample Name:	MW-231	**Units:**	ug/L
Lab Code:	K2204273-005	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	**0.56**	0.50	1	04/22/22 20:36	
Toluene	ND U	0.50	1	04/22/22 20:36	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	93	68 - 117	04/22/22 20:36	
Dibromofluoromethane	99	73 - 122	04/22/22 20:36	
Toluene-d8	99	65 - 144	04/22/22 20:36	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2204273
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/21/22 09:00
Sample Matrix:	Ground Water	**Date Received:**	04/21/22 16:30
Sample Name:	PZ-107	**Units:**	ug/L
Lab Code:	K2204273-001	**Basis:**	NA

Semivolatile Organic Compounds by GC/MS SIM

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Biphenyl	**17**	0.94	1	05/07/22 03:22	4/25/22	
Bis(2-ethylhexyl) Phthalate	ND U	1.9	1	05/07/22 03:22	4/25/22	
Diphenyl Ether	**64**	1.0	1	05/07/22 03:22	4/25/22	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2-Fluorobiphenyl	88	48 - 114	05/07/22 03:22	
Phenol-d6	86	38 - 107	05/07/22 03:22	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2204273
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/21/22 09:45
Sample Matrix:	Ground Water	**Date Received:**	04/21/22 16:30
Sample Name:	PZ-104	**Units:**	ug/L
Lab Code:	K2204273-002	**Basis:**	NA

Semivolatile Organic Compounds by GC/MS SIM

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Biphenyl	**54**	0.94	1	05/07/22 03:47	4/25/22	
Bis(2-ethylhexyl) Phthalate	ND U	1.9	1	05/07/22 03:47	4/25/22	
Diphenyl Ether	**3300**	20	20	05/09/22 09:23	4/25/22	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2-Fluorobiphenyl	93	48 - 114	05/07/22 03:47	
Phenol-d6	90	38 - 107	05/07/22 03:47	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2204273
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/21/22 10:15
Sample Matrix:	Ground Water	**Date Received:**	04/21/22 16:30
Sample Name:	MW-401	**Units:**	ug/L
Lab Code:	K2204273-003	**Basis:**	NA

Semivolatile Organic Compounds by GC/MS SIM

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Biphenyl	**44**	0.94	1	05/07/22 04:11	4/25/22	
Bis(2-ethylhexyl) Phthalate	ND U	1.9	1	05/07/22 04:11	4/25/22	
Diphenyl Ether	**2900**	20	20	05/09/22 09:48	4/25/22	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2-Fluorobiphenyl	88	48 - 114	05/07/22 04:11	
Phenol-d6	82	38 - 107	05/07/22 04:11	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2204273
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/21/22 11:00
Sample Matrix:	Ground Water	**Date Received:**	04/21/22 16:30
Sample Name:	MW-230	**Units:**	ug/L
Lab Code:	K2204273-004	**Basis:**	NA

Semivolatile Organic Compounds by GC/MS SIM

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Diphenyl Ether	**110**	1.0	1	05/07/22 04:36	4/25/22	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2-Fluorobiphenyl	85	48 - 114	05/07/22 04:36	
p-Terphenyl-d14	88	22 - 146	05/07/22 04:36	
Phenol-d6	92	38 - 107	05/07/22 04:36	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2204273
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/21/22 11:45
Sample Matrix:	Ground Water	**Date Received:**	04/21/22 16:30
Sample Name:	MW-231	**Units:**	ug/L
Lab Code:	K2204273-005	**Basis:**	NA

Semivolatile Organic Compounds by GC/MS SIM

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Diphenyl Ether	**45**	1.0	1	05/07/22 05:01	4/25/22	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2-Fluorobiphenyl	79	48 - 114	05/07/22 05:01	
p-Terphenyl-d14	92	22 - 146	05/07/22 05:01	
Phenol-d6	83	38 - 107	05/07/22 05:01	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2204273
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/21/22 12:30
Sample Matrix:	Ground Water	**Date Received:**	04/21/22 16:30
Sample Name:	MW-245	**Units:**	ug/L
Lab Code:	K2204273-006	**Basis:**	NA

Semivolatile Organic Compounds by GC/MS SIM

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Diphenyl Ether	**97**	1.0	1	05/07/22 05:25	4/25/22	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2-Fluorobiphenyl	84	48 - 114	05/07/22 05:25	
p-Terphenyl-d14	103	22 - 146	05/07/22 05:25	
Phenol-d6	83	38 - 107	05/07/22 05:25	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2204273
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/21/22 13:15
Sample Matrix:	Ground Water	**Date Received:**	04/21/22 16:30
Sample Name:	MW-256	**Units:**	ug/L
Lab Code:	K2204273-007	**Basis:**	NA

Semivolatile Organic Compounds by GC/MS SIM

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Diphenyl Ether	**14**	1.0	1	05/07/22 05:50	4/25/22	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2-Fluorobiphenyl	87	48 - 114	05/07/22 05:50	
p-Terphenyl-d14	103	22 - 146	05/07/22 05:50	
Phenol-d6	87	38 - 107	05/07/22 05:50	

Client: RSEC Inc **Service Request:** K2204273
Project: Lanxess Kalama Chemical/LKC-0422
Sample Matrix: Ground Water

SURROGATE RECOVERY SUMMARY
Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Extraction Method: None

Sample Name	Lab Code	4-Bromofluorobenzene 68-117	Dibromofluoromethane 73-122	Toluene-d8 65-144
PZ-107	K2204273-001	88	101	98
PZ-104	K2204273-002	90	100	98
MW-401	K2204273-003	89	100	97
MW-230	K2204273-004	88	101	98
MW-231	K2204273-005	93	99	99
Method Blank	KQ2206697-05	90	100	98
Lab Control Sample	KQ2206697-03	101	103	103
Duplicate Lab Control Sample	KQ2206697-04	100	104	103

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2204273
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KQ2206697-05	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	ND U	0.50	1	04/22/22 15:42	
Toluene	ND U	0.50	1	04/22/22 15:42	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	90	68 - 117	04/22/22 15:42	
Dibromofluoromethane	100	73 - 122	04/22/22 15:42	
Toluene-d8	98	65 - 144	04/22/22 15:42	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	RSEC Inc	**Service Request:**	K2204273
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Analyzed:**	04/22/22
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Duplicate Lab Control Sample Summary
Volatile Organic Compounds by GC/MS

Analysis Method:	8260C	**Units:**	ug/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	761628

	Lab Control Sample KQ2206697-03			Duplicate Lab Control Sample KQ2206697-04					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Benzene	10.9	10.0	109	11.0	10.0	110	69-124	<1	30
Toluene	10.5	10.0	105	10.8	10.0	108	69-124	3	30

Client: RSEC Inc **Service Request:** K2204273
Project: Lanxess Kalama Chemical/LKC-0422
Sample Matrix: Ground Water

SURROGATE RECOVERY SUMMARY
Semivolatile Organic Compounds by GC/MS SIM

Analysis Method: 8270D
Extraction Method: EPA 3520C

Sample Name	Lab Code	2-Fluorobiphenyl 48-114	p-Terphenyl-d14 22-146	Phenol-d6 38-107
PZ-107	K2204273-001	88		
PZ-107	K2204273-001			86
PZ-104	K2204273-002	93		
PZ-104	K2204273-002			90
MW-401	K2204273-003	88		
MW-401	K2204273-003			82
MW-230	K2204273-004	85	88	92
MW-231	K2204273-005	79	92	83
MW-245	K2204273-006	84	103	83
MW-256	K2204273-007	87	103	87
Method Blank	KQ2206402-03	89	112	85
Lab Control Sample	KQ2206402-01	100	106	96
Duplicate Lab Control Sample	KQ2206402-02	97	106	94

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2204273
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KQ2206402-03	**Basis:**	NA

Semivolatile Organic Compounds by GC/MS SIM

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Biphenyl	ND U	0.94	1	05/06/22 23:18	4/25/22	
Bis(2-ethylhexyl) Phthalate	ND U	1.9	1	05/06/22 23:18	4/25/22	
Diphenyl Ether	ND U	1.0	1	05/06/22 23:18	4/25/22	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2-Fluorobiphenyl	89	48 - 114	05/06/22 23:18	
p-Terphenyl-d14	112	22 - 146	05/06/22 23:18	
Phenol-d6	85	38 - 107	05/06/22 23:18	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	RSEC Inc	**Service Request:**	K2204273
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Analyzed:**	05/06/22 - 05/07/22
Sample Matrix:	Ground Water	**Date Extracted:**	04/25/22

Duplicate Lab Control Sample Summary
Semivolatile Organic Compounds by GC/MS SIM

Analysis Method:	8270D	**Units:**	ug/L
Prep Method:	EPA 3520C	**Basis:**	NA
		Analysis Lot:	763330

	Lab Control Sample KQ2206402-01			Duplicate Lab Control Sample KQ2206402-02					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Biphenyl	5.01	5.00	100	4.85	5.00	97	70-130	3	30
Bis(2-ethylhexyl) Phthalate	5.04	5.00	101	4.95	5.00	99	64-122	2	30
Diphenyl Ether	5.25	5.00	105	5.09	5.00	102	70-130	3	30

May 09, 2022 Service Request No:K2203995

Rich Truax
RSEC Inc
958 Hood View Ct.
Hood River, OR 97031

Laboratory Results for: Lanxess Kalama Chemical

Dear Rich,

Enclosed are the results of the sample(s) submitted to our laboratory April 14, 2022
For your reference, these analyses have been assigned our service request number **K2203995.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3364. You may also contact me via email at howard.holmes@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Howard Holmes
Project Manager

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626
PHONE +1 360 577 7222 | FAX +1 360 636 1068
ALS Group USA, Corp.
dba ALS Environmental

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

Client: RSEC Inc
Project: Lanxess Kalama Chemical
Sample Matrix: Water

Service Request: K2203995
Date Received: 04/14/2022

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

Sample Receipt:

Thirteen water samples were received for analysis at ALS Environmental on 04/14/2022. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Semivolatiles by GC/MS:

Method 8270D, 05/09/2022:Some samples required dilution due to the presence of elevated levels of target analyte. The reporting limits are adjusted to reflect the dilution.

Volatiles by GC/MS:

Method 8260C, 04/15/2022:Samples K2203995-001 (ISRW-1), K2203995-002 (ISRW-2), K2203995-003 (ISRW-3), K2203995-004 (ISRW-4), K2203995-005 (ISRW-5), K2203995-006 (ISRW-6), K2203995-008 (ISRW-8), K2203995-009 (ISRW-9), and K2203995-010 (ISRW-100 required dilutions due to the presence of elevated levels of target analytes. The reporting limits are adjusted to reflect the dilution.

Approved by  Date 05/09/2022

SAMPLE DETECTION SUMMARY

This form includes only detections above the reporting levels. For a full listing of sample results, continue to the Sample Results section of this Report.

CLIENT ID: ISRW-1 — **Lab ID: K2203995-001**

Analyte	Results	Flag	MDL	MRL	Units	Method
Toluene	11000			500	ug/L	8260C

CLIENT ID: ISRW-2 — **Lab ID: K2203995-002**

Analyte	Results	Flag	MDL	MRL	Units	Method
Benzene	27			13	ug/L	8260C
Toluene	8600			250	ug/L	8260C

CLIENT ID: ISRW-3 — **Lab ID: K2203995-003**

Analyte	Results	Flag	MDL	MRL	Units	Method
Benzene	120			100	ug/L	8260C
Toluene	73000			2500	ug/L	8260C

CLIENT ID: ISRW-4 — **Lab ID: K2203995-004**

Analyte	Results	Flag	MDL	MRL	Units	Method
Benzene	11			2.5	ug/L	8260C
Toluene	690			25	ug/L	8260C

CLIENT ID: ISRW-5 — **Lab ID: K2203995-005**

Analyte	Results	Flag	MDL	MRL	Units	Method
Toluene	34000			1300	ug/L	8260C

CLIENT ID: ISRW-6 — **Lab ID: K2203995-006**

Analyte	Results	Flag	MDL	MRL	Units	Method
Benzene	140			50	ug/L	8260C
Toluene	31000			1300	ug/L	8260C

CLIENT ID: ISRW-8 — **Lab ID: K2203995-008**

Analyte	Results	Flag	MDL	MRL	Units	Method
Benzene	56			50	ug/L	8260C
Toluene	39000			2500	ug/L	8260C

CLIENT ID: ISRW-9 — **Lab ID: K2203995-009**

Analyte	Results	Flag	MDL	MRL	Units	Method
Benzene	36			13	ug/L	8260C
Toluene	8700			250	ug/L	8260C

CLIENT ID: ISRW-10 — **Lab ID: K2203995-010**

Analyte	Results	Flag	MDL	MRL	Units	Method
Benzene	63			50	ug/L	8260C
Toluene	45000			500	ug/L	8260C

CLIENT ID: W-Sump — **Lab ID: K2203995-011**

Analyte	Results	Flag	MDL	MRL	Units	Method
Benzene	2.7			0.50	ug/L	8260C
Biphenyl	5.4			0.94	ug/L	8270D

SAMPLE DETECTION SUMMARY

This form includes only detections above the reporting levels. For a full listing of sample results, continue to the Sample Results section of this Report.

CLIENT ID: W-Sump			Lab ID: K2203995-011			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Diphenyl Ether	400			5.0	ug/L	8270D

CLIENT ID: E-Sump			Lab ID: K2203995-012			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Diphenyl Ether	99			1.0	ug/L	8270D

CHAIN OF CUSTODY

ALS Environmental

1317 South 13th Ave., Kelso, WA 98626 | +1 360 577 7222 | +1 800 695 7222 | +1 360 636 1068 (fax)

SR# K2203995

PAGE 1 OF 2 COC#

PROJECT NAME: Lanxess Kalama
PROJECT NUMBER: LKC-0422
PROJECT MANAGER: Rich Trulx
COMPANY NAME: RSEC
ADDRESS: 958 Hood View Ct.
CITY/STATE/ZIP: Hood River OR 97031
E-MAIL ADDRESS: richa@rsecinc.com
PHONE # 541.490.4223 FAX #
SAMPLER'S SIGNATURE:

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Semivolatile Organics by GC/MS 625☐ 8270☐ SIM PAH☐	Volatile Organics 624☐ 8270LL☐ 8021☐ BTEX☐	Hydrocarbons (*see below) Gas☐ Diesel☐ Oil☐	Oil & Grease/TRPH 1664 HEM☐ 1664 SGT☐	PCBs Aroclors☐ Congeners☐	Pesticides/Herbicides 608☐ 8081☐ 8141☐ 8151☐	Chlorophenolics - 8151M Tri☐ Tetra☐ PCP☐	Metals, Total or Dissolved (See List below)	Cyanide☐ Hex-Chrom☐	(circle) pH, Cond., Cl, SO_4, PO_4, F, NO_2, NO_3, BOD, TSS, TDS, Turb.	(circle) NH_3-N, COD, TKN, TOC, DOC, NO_2+NO_3, T-Phos	TOX 9020☐ AOX 1650☐ 506☐	Alkalinity ☐ CO_3 ☐ HCO_3 ☐	Dioxins/Furans 1613☐ 8290☐	Dissolved Gases CO_2☐ RSK 175☐ Methane☐ Ethane☐ Ethene☐	REMARKS
ISRW-1	4/14/22	1100		GW	3		X														
ISRW-2		1110																			
ISRW-3		1120																			
ISRW-4		1130																			
ISRW-5		1140																			
ISRW-6		1150																			
ISRW-7		1200																			
ISRW-8		1210																			
ISRW-9		1220																			
ISRW-10		1230																			

REPORT REQUIREMENTS

- X I. Routine Report: Method Blank, Surrogate, as required
- ___ II. Report Dup., MS, MSD as required
- ___ III. CLP Like Summary (no raw data)
- ___ IV. Data Validation Report
- ___ V. EDD

INVOICE INFORMATION

P.O. # LKC-0422
Bill To:
richa@rsecinc.com

TURNAROUND REQUIREMENTS

- ___ 24 hr. ___ 48 hr.
- ___ 5 day
- X Standard (15 working days)
- ___ Provide FAX Results

Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER: ___ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:

8260 benzene + toluene only
For non-detects need benzene <2 ug/L if possible

Container Supply Number

123051

☐ Sample Shipment contains USDA regulated soil samples (check box if applicable)

RELINQUISHED BY:		RECEIVED BY:		RELINQUISHED BY:		RECEIVED BY:	
Signature	Date/Time 4/14/22	Signature	Date/Time 4/14/22 1545	Signature	Date/Time	Signature	Date/Time
Printed Name R. Trulx	Firm RSEC	Printed Name	Firm	Printed Name	Firm	Printed Name	Firm

CHAIN OF CUSTODY

ALS Environmental

1317 South 13th Ave., Kelso, WA 98626 | +1 360 577 7222 | +1 800 695 7222 | +1 360 636 1068 (fax)

SR# K2203995

PAGE 2 OF 2 COC#

PROJECT NAME: Lakess Kalama
PROJECT NUMBER: LKC-0422
PROJECT MANAGER: Rich Truex
COMPANY NAME: RSE
ADDRESS: 958 Hood View Ct.
CITY/STATE/ZIP: Hood River OR 97031
E-MAIL ADDRESS: richt@rseinc.com
PHONE #: 541-490-4223 FAX #:
SAMPLER'S SIGNATURE:

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Semivolatile Organics by GC/MS 625☐ 8270☒ 8270LL☐ SIM PAH☐	Volatile Organics 624☐ 8260☒ 8021☐ BTEX☐	Hydrocarbons (*see below) Gas☐ Diesel☐ Oil☐	Oil & Grease/TRPH 1664 HEM☐ 1664 SGT☐	PCBs Aroclors☐ Congeners☐	Pesticides/Herbicides 608☐ 8081☐ 8141☐ 8151☐	Chlorophenolics - 8151M Tri☐ Tetra☐ PCP☐	Metals, Total or Dissolved (See List below)	Cyanide☐ Hex-Chrom☐	(circle) pH, Cond., Cl, SO_4, PO_4, F, NO_2, NO_3, BOD, TSS, TDS, Turb.	(circle) NH_3-N, COD, TKN, TOC, DOC, NO_2+NO_3, T-Phos	TOX 9020☐ AOX 1650☐ 506☐	Alkalinity☐ CO_3☐ HCO_3☐	Dioxins/Furans 1613☐ 8290☐	Dissolved Gases CO_2☐ RSK 175☐ Methane☐ Ethane☐ Ethene☐	REMARKS
W-Sump	4/14/22	1300		GW	5		X	X														
E-Sump	↓	1315		↓	5		↓	↓														
MS/MSD ES	↓	1315		↓	8		↓	↓														

REPORT REQUIREMENTS

- ☒ I. Routine Report: Method Blank, Surrogate, as required
- ☐ II. Report Dup., MS, MSD as required
- ☐ III. CLP Like Summary (no raw data)
- ☐ IV. Data Validation Report
- ☐ V. EDD

INVOICE INFORMATION

P.O. # LKC-0422
Bill To: richt@rseinc.com

TURNAROUND REQUIREMENTS

☐ 24 hr. ☐ 48 hr.
☐ 5 day
☒ Standard (15 working days)
☐ Provide FAX Results

Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER: (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:

8260: Benzene (<2.0 ug/L) + toluene

8270: biphenyl + diphenyl ether.

Container Supply Number

123051

☐ Sample Shipment contains USDA regulated soil samples (check box if applicable)

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature: R. Truex	Signature:	Signature:	Signature:
Date/Time: 4/14/22	Date/Time: 4/14/22 1545	Date/Time:	Date/Time:
Printed Name: R. Truex	Printed Name: Naomi Rodriguez	Printed Name:	Printed Name:
Firm: RSE	Firm: ALS	Firm:	Firm:

PM HH

Cooler Receipt and Preservation Form

Client PSCC Service Request K22 03995

Received: 4/14/22 Opened: 4/14/22 By: NP Unloaded: 4/14/22 By: NP

1. Samples were received via? *USPS* *Fed Ex* *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) *Cooler* *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 1 front
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
6.9	9.2	IR02	6				

4. Was a Temperature Blank present in cooler? NA (Y) N If yes, notate the temperature in the appropriate column above:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA Y (N)
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA (Y) N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

6. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* _____
7. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
8. Were samples received in good condition (unbroken) NA (Y) N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA (Y) N
10. Did all sample labels and tags agree with custody papers? NA (Y) N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA (Y) N
13. Were VOA vials received without headspace? *Indicate in the table below.* NA (Y) N
14. Was C12/Res negative? NA (Y) N
15. Were 100ml sterile microbiology bottles filled exactly to the 100ml mark? (NA) Y N Under filled Overfilled

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, Resolutions: Received 2 trip blanks not on COC

1/13/22 *Page ____ of ____*

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2203995
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/14/22 11:00
Sample Matrix:	Water	**Date Received:**	04/14/22 15:45
Sample Name:	ISRW-1	**Units:**	ug/L
Lab Code:	K2203995-001	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	ND U	25	50	04/15/22 18:30	
Toluene	**11000**	500	1000	04/15/22 15:28	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	68 - 117	04/15/22 18:30	
Dibromofluoromethane	115	73 - 122	04/15/22 18:30	
Toluene-d8	94	65 - 144	04/15/22 18:30	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2203995
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/14/22 11:10
Sample Matrix:	Water	**Date Received:**	04/14/22 15:45
Sample Name:	ISRW-2	**Units:**	ug/L
Lab Code:	K2203995-002	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	**27**	13	25	04/15/22 18:53	
Toluene	**8600**	250	500	04/15/22 15:51	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	97	68 - 117	04/15/22 18:53	
Dibromofluoromethane	117	73 - 122	04/15/22 18:53	
Toluene-d8	94	65 - 144	04/15/22 18:53	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2203995
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/14/22 11:20
Sample Matrix:	Water	**Date Received:**	04/14/22 15:45
Sample Name:	ISRW-3	**Units:**	ug/L
Lab Code:	K2203995-003	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	**120**	100	200	04/15/22 19:16	
Toluene	**73000**	2500	5000	04/15/22 16:14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	68 - 117	04/15/22 19:16	
Dibromofluoromethane	117	73 - 122	04/15/22 19:16	
Toluene-d8	95	65 - 144	04/15/22 19:16	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2203995
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/14/22 11:30
Sample Matrix:	Water	**Date Received:**	04/14/22 15:45
Sample Name:	ISRW-4	**Units:**	ug/L
Lab Code:	K2203995-004	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	**11**	2.5	5	04/15/22 19:39	
Toluene	**690**	25	50	04/15/22 18:08	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	96	68 - 117	04/15/22 19:39	
Dibromofluoromethane	114	73 - 122	04/15/22 19:39	
Toluene-d8	94	65 - 144	04/15/22 19:39	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2203995
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/14/22 11:40
Sample Matrix:	Water	**Date Received:**	04/14/22 15:45
Sample Name:	ISRW-5	**Units:**	ug/L
Lab Code:	K2203995-005	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	ND U	100	200	04/15/22 20:02	
Toluene	**34000**	1300	2500	04/15/22 16:36	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	68 - 117	04/15/22 20:02	
Dibromofluoromethane	114	73 - 122	04/15/22 20:02	
Toluene-d8	93	65 - 144	04/15/22 20:02	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2203995
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/14/22 11:50
Sample Matrix:	Water	**Date Received:**	04/14/22 15:45
Sample Name:	ISRW-6	**Units:**	ug/L
Lab Code:	K2203995-006	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	**140**	50	100	04/15/22 20:24	
Toluene	**31000**	1300	2500	04/15/22 16:59	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	68 - 117	04/15/22 20:24	
Dibromofluoromethane	116	73 - 122	04/15/22 20:24	
Toluene-d8	94	65 - 144	04/15/22 20:24	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2203995
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/14/22 12:00
Sample Matrix:	Water	**Date Received:**	04/14/22 15:45
Sample Name:	ISRW-7	**Units:**	ug/L
Lab Code:	K2203995-007	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	ND U	0.50	1	04/25/22 20:10	
Toluene	ND U	0.50	1	04/25/22 20:10	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	83	68 - 117	04/25/22 20:10	
Dibromofluoromethane	103	73 - 122	04/25/22 20:10	
Toluene-d8	105	65 - 144	04/25/22 20:10	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2203995
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/14/22 12:10
Sample Matrix:	Water	**Date Received:**	04/14/22 15:45
Sample Name:	ISRW-8	**Units:**	ug/L
Lab Code:	K2203995-008	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	**56**	50	100	04/15/22 20:47	
Toluene	**39000**	2500	5000	04/15/22 17:22	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	97	68 - 117	04/15/22 20:47	
Dibromofluoromethane	108	73 - 122	04/15/22 20:47	
Toluene-d8	94	65 - 144	04/15/22 20:47	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2203995
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/14/22 12:20
Sample Matrix:	Water	**Date Received:**	04/14/22 15:45
Sample Name:	ISRW-9	**Units:**	ug/L
Lab Code:	K2203995-009	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	**36**	13	25	04/15/22 21:10	
Toluene	**8700**	250	500	04/15/22 17:45	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	68 - 117	04/15/22 21:10	
Dibromofluoromethane	117	73 - 122	04/15/22 21:10	
Toluene-d8	94	65 - 144	04/15/22 21:10	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2203995
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/14/22 12:30
Sample Matrix:	Water	**Date Received:**	04/14/22 15:45
Sample Name:	ISRW-10	**Units:**	ug/L
Lab Code:	K2203995-010	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	**63**	50	100	04/25/22 21:24	
Toluene	**45000**	500	1000	04/25/22 20:59	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	84	68 - 117	04/25/22 21:24	
Dibromofluoromethane	104	73 - 122	04/25/22 21:24	
Toluene-d8	97	65 - 144	04/25/22 21:24	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2203995
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/14/22 13:00
Sample Matrix:	Water	**Date Received:**	04/14/22 15:45
Sample Name:	W-Sump	**Units:**	ug/L
Lab Code:	K2203995-011	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	**2.7**	0.50	1	04/25/22 20:35	
Toluene	ND U	0.50	1	04/25/22 20:35	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	85	68 - 117	04/25/22 20:35	
Dibromofluoromethane	103	73 - 122	04/25/22 20:35	
Toluene-d8	98	65 - 144	04/25/22 20:35	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2203995
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/14/22 13:15
Sample Matrix:	Water	**Date Received:**	04/14/22 15:45
Sample Name:	E-Sump	**Units:**	ug/L
Lab Code:	K2203995-012	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	ND U	0.50	1	04/15/22 13:34	
Toluene	ND U	0.50	1	04/15/22 13:34	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	68 - 117	04/15/22 13:34	
Dibromofluoromethane	106	73 - 122	04/15/22 13:34	
Toluene-d8	97	65 - 144	04/15/22 13:34	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2203995
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/14/22
Sample Matrix:	Water	**Date Received:**	04/14/22 15:45
Sample Name:	Trip Blank	**Units:**	ug/L
Lab Code:	K2203995-013	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	ND U	0.50	1	04/25/22 14:51	
Toluene	ND U	0.50	1	04/25/22 14:51	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	87	68 - 117	04/25/22 14:51	
Dibromofluoromethane	100	73 - 122	04/25/22 14:51	
Toluene-d8	98	65 - 144	04/25/22 14:51	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2203995
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/14/22 13:00
Sample Matrix:	Water	**Date Received:**	04/14/22 15:45
Sample Name:	W-Sump	**Units:**	ug/L
Lab Code:	K2203995-011	**Basis:**	NA

Semivolatile Organic Compounds by GC/MS SIM

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Biphenyl	**5.4**	0.94	1	05/07/22 00:31	4/20/22	
Diphenyl Ether	**400**	5.0	5	05/09/22 08:10	4/20/22	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2-Fluorobiphenyl	99	48 - 114	05/07/22 00:31	
Phenol-d6	97	38 - 107	05/07/22 00:31	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2203995
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/14/22 13:15
Sample Matrix:	Water	**Date Received:**	04/14/22 15:45
Sample Name:	E-Sump	**Units:**	ug/L
Lab Code:	K2203995-012	**Basis:**	NA

Semivolatile Organic Compounds by GC/MS SIM

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Biphenyl	ND U	0.94	1	05/07/22 00:56	4/20/22	
Diphenyl Ether	**99**	1.0	1	05/07/22 00:56	4/20/22	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2-Fluorobiphenyl	97	48 - 114	05/07/22 00:56	
Phenol-d6	94	38 - 107	05/07/22 00:56	

Client: RSEC Inc **Service Request:** K2203995

Project: Lanxess Kalama Chemical/LKC-0422

Sample Matrix: Water

SURROGATE RECOVERY SUMMARY
Volatile Organic Compounds by GC/MS

Analysis Method: 8260C

Extraction Method: None

Sample Name	Lab Code	4-Bromofluorobenzene 68-117	Dibromofluoromethane 73-122	Toluene-d8 65-144
ISRW-1	K2203995-001	100	115	94
ISRW-2	K2203995-002	97	117	94
ISRW-3	K2203995-003	98	117	95
ISRW-4	K2203995-004	96	114	94
ISRW-5	K2203995-005	102	114	93
ISRW-6	K2203995-006	99	116	94
ISRW-7	K2203995-007	83	103	105
ISRW-8	K2203995-008	97	108	94
ISRW-9	K2203995-009	98	117	94
ISRW-10	K2203995-010	84	104	97
W-Sump	K2203995-011	85	103	98
E-Sump	K2203995-012	98	106	97
Trip Blank	K2203995-013	87	100	98
Method Blank	KQ2206109-05	97	100	97
Method Blank	KQ2206814-05	89	99	99
Lab Control Sample	KQ2206109-03	93	102	96
Duplicate Lab Control Sample	KQ2206109-04	94	104	97
Lab Control Sample	KQ2206814-03	101	104	104
Duplicate Lab Control Sample	KQ2206814-04	101	103	103
E-Sump	KQ2206109-06	94	102	97
E-Sump	KQ2206109-07	94	103	97

Client:	RSEC Inc	**Service Request:**	K2203995
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/14/22
Sample Matrix:	Water	**Date Received:**	04/14/22
		Date Analyzed:	04/15/22
		Date Extracted:	NA

Duplicate Matrix Spike Summary
Volatile Organic Compounds by GC/MS

Sample Name:	E-Sump	**Units:**	ug/L
Lab Code:	K2203995-012	**Basis:**	NA
Analysis Method:	8260C		
Prep Method:	None		

		Matrix Spike KQ2206109-06			Duplicate Matrix Spike KQ2206109-07					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Benzene	ND U	10.3	10.0	103	10.3	10.0	103	63-144	<1	30
Toluene	ND U	8.59	10.0	86	8.61	10.0	86	71-136	<1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2203995
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KQ2206109-05	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	ND U	0.50	1	04/15/22 13:11	
Toluene	ND U	0.50	1	04/15/22 13:11	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	97	68 - 117	04/15/22 13:11	
Dibromofluoromethane	100	73 - 122	04/15/22 13:11	
Toluene-d8	97	65 - 144	04/15/22 13:11	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2203995
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KQ2206814-05	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	ND U	0.50	1	04/25/22 14:01	
Toluene	ND U	0.50	1	04/25/22 14:01	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	89	68 - 117	04/25/22 14:01	
Dibromofluoromethane	99	73 - 122	04/25/22 14:01	
Toluene-d8	99	65 - 144	04/25/22 14:01	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	RSEC Inc	**Service Request:**	K2203995
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Analyzed:**	04/15/22
Sample Matrix:	Water	**Date Extracted:**	NA

Duplicate Lab Control Sample Summary
Volatile Organic Compounds by GC/MS

Analysis Method:	8260C	**Units:**	ug/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	760737

	Lab Control Sample KQ2206109-03			Duplicate Lab Control Sample KQ2206109-04					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Benzene	9.57	10.0	96	10.7	10.0	107	69-124	11	30
Toluene	7.89	10.0	79	8.98	10.0	90	69-124	13	30

Client:	RSEC Inc	**Service Request:**	K2203995
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Analyzed:**	04/25/22
Sample Matrix:	Water	**Date Extracted:**	NA

Duplicate Lab Control Sample Summary
Volatile Organic Compounds by GC/MS

Analysis Method:	8260C	**Units:**	ug/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	761826

	Lab Control Sample KQ2206814-03			Duplicate Lab Control Sample KQ2206814-04					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Benzene	11.4	10.0	114	10.9	10.0	109	69-124	5	30
Toluene	11.2	10.0	112	10.7	10.0	107	69-124	5	30

Client: RSEC Inc **Service Request:** K2203995

Project: Lanxess Kalama Chemical/LKC-0422

Sample Matrix: Water

SURROGATE RECOVERY SUMMARY
Semivolatile Organic Compounds by GC/MS SIM

Analysis Method: 8270D

Extraction Method: EPA 3520C

Sample Name	Lab Code	2-Fluorobiphenyl 48-114	Phenol-d6 38-107
W-Sump	K2203995-011	99	97
E-Sump	K2203995-012	97	94
Method Blank	KQ2206194-04	97	93
Lab Control Sample	KQ2206194-03	97	93
E-Sump	KQ2206194-01	99	97
E-Sump	KQ2206194-02	93	92

Client:	RSEC Inc	**Service Request:**	K2203995
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/14/22
Sample Matrix:	Water	**Date Received:**	04/14/22
		Date Analyzed:	05/7/22
		Date Extracted:	04/20/22

Duplicate Matrix Spike Summary
Semivolatile Organic Compounds by GC/MS SIM

Sample Name:	E-Sump	**Units:**	ug/L
Lab Code:	K2203995-012	**Basis:**	NA
Analysis Method:	8270D		
Prep Method:	EPA 3520C		

		Matrix Spike KQ2206194-01			Duplicate Matrix Spike KQ2206194-02					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Biphenyl	ND U	4.57	4.72	97	4.77	5.00	95	70-130	4	30
Diphenyl Ether	99	105	4.72	131 #	107	5.00	158 #	70-130	2	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2203995
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KQ2206194-04	**Basis:**	NA

Semivolatile Organic Compounds by GC/MS SIM

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Biphenyl	ND U	0.94	1	05/06/22 22:29	4/20/22	
Diphenyl Ether	ND U	1.0	1	05/06/22 22:29	4/20/22	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2-Fluorobiphenyl	97	48 - 114	05/06/22 22:29	
Phenol-d6	93	38 - 107	05/06/22 22:29	

Client:	RSEC Inc	**Service Request:**	K2203995
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Analyzed:**	05/06/22
Sample Matrix:	Water	**Date Extracted:**	04/20/22

Lab Control Sample Summary
Semivolatile Organic Compounds by GC/MS SIM

Analysis Method:	8270D	**Units:**	ug/L
Prep Method:	EPA 3520C	**Basis:**	NA
		Analysis Lot:	763330

Lab Control Sample
KQ2206194-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Biphenyl	4.79	5.00	96	70-130
Diphenyl Ether	5.04	5.00	101	70-130

May 09, 2022 Service Request No:K2204138

Rich Truax
RSEC Inc
958 Hood View Ct.
Hood River, OR 97031

Laboratory Results for: Lanxess Kalama Chemical

Dear Rich,

Enclosed are the results of the sample(s) submitted to our laboratory April 19, 2022
For your reference, these analyses have been assigned our service request number **K2204138.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3364. You may also contact me via email at howard.holmes@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Howard Holmes
Project Manager

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Client: RSEC Inc
Project: Lanxess Kalama Chemical
Sample Matrix: Water

Service Request: K2204138
Date Received: 04/19/2022

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

Sample Receipt:

Eight water samples were received for analysis at ALS Environmental on 04/19/2022. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Semivolatiles by GC/MS:

Method 8270D, 05/09/2022:Some samples required dilution due to the presence of elevated levels of target analyte. The reporting limits are adjusted to reflect the dilution.

Volatiles by GC/MS:

Method 8260C, 04/26/2022:Samples K2204138-002 (MW-239) and K2204138-003 (MW-97) required dilutions due to the presence of elevated levels of target analytes. The reporting limits are adjusted to reflect the dilution.

Approved by  Date 05/09/2022

SAMPLE DETECTION SUMMARY

This form includes only detections above the reporting levels. For a full listing of sample results, continue to the Sample Results section of this Report.

CLIENT ID: MW-239			Lab ID: K2204138-002			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Benzene	91			2.5	ug/L	8260C
Toluene	2200			50	ug/L	8260C

CLIENT ID: MW-97			Lab ID: K2204138-003			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Benzene	87			5.0	ug/L	8260C
Toluene	2100			50	ug/L	8260C

CLIENT ID: KC-14			Lab ID: K2204138-004			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Benzene	2.8			0.50	ug/L	8260C
Toluene	15			0.50	ug/L	8260C

CLIENT ID: PDW-117			Lab ID: K2204138-007			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Diphenyl Ether	1300			10	ug/L	8270D

CLIENT ID: KC-9			Lab ID: K2204138-008			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Benzene	1.0			0.50	ug/L	8260C
Diphenyl Ether	1400			10	ug/L	8270D

CHAIN OF CUSTODY

ALS Environmental

SR# 16220 4138

1317 South 13th Ave., Kelso, WA 98626 | +1 360 577 7222 | +1 800 695 7222 | +1 360 636 1068 (fax)

PAGE ____ OF ____ COC# ____

PROJECT NAME: Lanxess Kalama Chemical
PROJECT NUMBER: LKC-0422
PROJECT MANAGER: Rick Trulx
COMPANY NAME: RSEC
ADDRESS: 958 Hood View Ct.
CITY/STATE/ZIP: Hood River, OR. 97031
E-MAIL ADDRESS: richa@rsecinc.com
PHONE #: 541-490-4223 FAX #:
SAMPLER'S SIGNATURE:

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Semivolatile Organics by GC/MS 625☐ 8270☒ 8270LL☐ SIM PAH☐	Volatile Organics 624☐ 8260☒ 8021☐ BTEX☐	Hydrocarbons (*see below) Gas☐ Diesel☐ Oil☐	Oil & Grease/TRPH 1664 HEM☐ 1664 SGT☐	PCBs Aroclors☐ Congeners☐	Pesticides/Herbicides 608☐ 8081☐ 8141☐ 8151☐	Chlorophenolics - 8151M Tri☐ Tetra☐ PCP☐	Metals, Total or Dissolved (See List below)	Cyanide☐ Hex-Chrom☐	(circle) pH, Cond., Cl, SO_4, PO_4, F, NO_2, NO_3, BOD, TSS, TDS, Turb.	(circle) NH_3-N, COD, TKN, TOC, DOC, NO_2+NO_3, T-Phos	TOX 9020☐ AOX 1650☐ 506☐	Alkalinity☐ CO_3☐ HCO_3☐	Dioxins/Furans 1613☐ 8290☐	Dissolved Gases RSK 175☐ CO_2☐ Methane☐ Ethane☐ Ethene☐	REMARKS
MW-250	4/19	1000		GW	3		X														
MW-239	"	1045		"	"		X														
MW-97	"	1100		"	"		X														
KC-14	"	1145		"	"		X														
MW-243	"	1230		"	↓		X														
USRW-2	"	1315		"	2	X															
PDW-117	"	1400		"	5	X	X														
KC-9	↓	1500		↓	5	X	X														

TB Supplied By LAB / No Analysis Requested

REPORT REQUIREMENTS

- X I. Routine Report: Method Blank, Surrogate, as required
- ___ II. Report Dup., MS, MSD as required
- ___ III. CLP Like Summary (no raw data)
- ___ IV. Data Validation Report
- ___ V. EDD

INVOICE INFORMATION

P.O. # LKC-0422
Bill To: richa@rsecinc.com

TURNAROUND REQUIREMENTS

___ 24 hr. ___ 48 hr.
___ 5 day
X Standard (15 working days)
___ Provide FAX Results
___ Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER: ____ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:

8260; Benzene (D.L. <1.20 ug/L) + toluene only

8270; Diphenyl Ether only (DL < 410 ug/L) ["DPO - Diphenyl Oxide"]

Container Supply Number

123051

☐ Sample Shipment contains USDA regulated soil samples (check box if applicable)

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature:	Signature:	Signature:	Signature:
Date/Time: 4/19/22/1615	Date/Time: 4/19/22	Date/Time:	Date/Time:
Printed Name: R Trulx	Printed Name: L Morrow	Printed Name:	Printed Name:
Firm: RSEC	Firm: ALS	Firm:	Firm:

PM MM

Cooler Receipt and Preservation Form

Client RSEC Environmental + Engineering Service Request K2204138

Received: 4/19/22 Opened: 4/19/22 By: Unloaded: 4/19/22 By:

1. Samples were received via? *USPS* *Fed Ex* *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) *Cooler* *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA Y N If yes, how many and where? 1 Front.
   If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp Indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
	5.7	IR01	123051				

4. Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column above:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA Y N
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA Y N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

6. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* _____
7. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
8. Were samples received in good condition (unbroken) NA Y N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N
10. Did all sample labels and tags agree with custody papers? NA Y N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
13. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
14. Was C12/Res negative? NA Y N
15. Were 100ml sterile microbiology bottles filled exactly to the 100ml mark? NA Y N Under filled Overfilled

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, Resolutions: Did not rec Trip Blank

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2204138
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/19/22 10:00
Sample Matrix:	Water	**Date Received:**	04/19/22 16:15
Sample Name:	MW-250	**Units:**	ug/L
Lab Code:	K2204138-001	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	ND U	0.50	1	04/26/22 14:04	
Toluene	ND U	0.50	1	04/26/22 14:04	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	71	68 - 117	04/26/22 14:04	
Dibromofluoromethane	108	73 - 122	04/26/22 14:04	
Toluene-d8	94	65 - 144	04/26/22 14:04	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2204138
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/19/22 10:45
Sample Matrix:	Water	**Date Received:**	04/19/22 16:15
Sample Name:	MW-239	**Units:**	ug/L
Lab Code:	K2204138-002	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	**91**	2.5	5	04/26/22 17:09	
Toluene	**2200**	50	100	04/26/22 16:16	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	89	68 - 117	04/26/22 17:09	
Dibromofluoromethane	102	73 - 122	04/26/22 17:09	
Toluene-d8	90	65 - 144	04/26/22 17:09	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2204138
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/19/22 11:00
Sample Matrix:	Water	**Date Received:**	04/19/22 16:15
Sample Name:	MW-97	**Units:**	ug/L
Lab Code:	K2204138-003	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	**87**	5.0	10	04/26/22 17:36	
Toluene	**2100**	50	100	04/26/22 16:43	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	88	68 - 117	04/26/22 17:36	
Dibromofluoromethane	100	73 - 122	04/26/22 17:36	
Toluene-d8	89	65 - 144	04/26/22 17:36	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2204138
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/19/22 11:45
Sample Matrix:	Water	**Date Received:**	04/19/22 16:15
Sample Name:	KC-14	**Units:**	ug/L
Lab Code:	K2204138-004	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	**2.8**	0.50	1	04/26/22 14:31	
Toluene	**15**	0.50	1	04/26/22 14:31	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	74	68 - 117	04/26/22 14:31	
Dibromofluoromethane	108	73 - 122	04/26/22 14:31	
Toluene-d8	94	65 - 144	04/26/22 14:31	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2204138
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/19/22 12:30
Sample Matrix:	Water	**Date Received:**	04/19/22 16:15
Sample Name:	MW-243	**Units:**	ug/L
Lab Code:	K2204138-005	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	ND U	0.50	1	04/26/22 14:57	
Toluene	ND U	0.50	1	04/26/22 14:57	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	74	68 - 117	04/26/22 14:57	
Dibromofluoromethane	106	73 - 122	04/26/22 14:57	
Toluene-d8	92	65 - 144	04/26/22 14:57	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2204138
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/19/22 14:00
Sample Matrix:	Water	**Date Received:**	04/19/22 16:15
Sample Name:	PDW-117	**Units:**	ug/L
Lab Code:	K2204138-007	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	ND U	0.50	1	04/26/22 15:23	
Toluene	ND U	0.50	1	04/26/22 15:23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	74	68 - 117	04/26/22 15:23	
Dibromofluoromethane	110	73 - 122	04/26/22 15:23	
Toluene-d8	94	65 - 144	04/26/22 15:23	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2204138
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/19/22 15:00
Sample Matrix:	Water	**Date Received:**	04/19/22 16:15
Sample Name:	KC-9	**Units:**	ug/L
Lab Code:	K2204138-008	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	**1.0**	0.50	1	04/26/22 15:50	
Toluene	ND U	0.50	1	04/26/22 15:50	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	75	68 - 117	04/26/22 15:50	
Dibromofluoromethane	112	73 - 122	04/26/22 15:50	
Toluene-d8	95	65 - 144	04/26/22 15:50	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2204138
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/19/22 13:15
Sample Matrix:	Water	**Date Received:**	04/19/22 16:15
Sample Name:	USRW-2	**Units:**	ug/L
Lab Code:	K2204138-006	**Basis:**	NA

Semivolatile Organic Compounds by GC/MS SIM

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Diphenyl Ether	ND U	1.0	1	05/07/22 02:09	4/25/22	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2-Fluorobiphenyl	90	48 - 114	05/07/22 02:09	
p-Terphenyl-d14	100	22 - 146	05/07/22 02:09	
Phenol-d6	89	38 - 107	05/07/22 02:09	

Client:	RSEC Inc	**Service Request:**	K2204138
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/19/22 14:00
Sample Matrix:	Water	**Date Received:**	04/19/22 16:15
Sample Name:	PDW-117	**Units:**	ug/L
Lab Code:	K2204138-007	**Basis:**	NA

Semivolatile Organic Compounds by GC/MS SIM

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Diphenyl Ether	**1300**	10	10	05/09/22 08:34	4/25/22	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2-Fluorobiphenyl	92	48 - 114	05/07/22 02:33	
p-Terphenyl-d14	99	22 - 146	05/07/22 02:33	
Phenol-d6	98	38 - 107	05/07/22 02:33	

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2204138
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	04/19/22 15:00
Sample Matrix:	Water	**Date Received:**	04/19/22 16:15
Sample Name:	KC-9	**Units:**	ug/L
Lab Code:	K2204138-008	**Basis:**	NA

Semivolatile Organic Compounds by GC/MS SIM

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Diphenyl Ether	**1400**	10	10	05/09/22 08:59	4/25/22	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2-Fluorobiphenyl	87	48 - 114	05/07/22 02:58	
p-Terphenyl-d14	100	22 - 146	05/07/22 02:58	
Phenol-d6	85	38 - 107	05/07/22 02:58	

Client: RSEC Inc **Service Request:** K2204138
Project: Lanxess Kalama Chemical/LKC-0422
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY
Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Extraction Method: None

Sample Name	Lab Code	4-Bromofluorobenzene 68-117	Dibromofluoromethane 73-122	Toluene-d8 65-144
MW-250	K2204138-001	71	108	94
MW-239	K2204138-002	89	102	90
MW-97	K2204138-003	88	100	89
KC-14	K2204138-004	74	108	94
MW-243	K2204138-005	74	106	92
PDW-117	K2204138-007	74	110	94
KC-9	K2204138-008	75	112	95
Method Blank	KQ2206919-05	73	103	93
Lab Control Sample	KQ2206919-03	90	97	100
Duplicate Lab Control Sample	KQ2206919-04	90	93	98

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2204138
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KQ2206919-05	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Benzene	ND U	0.50	1	04/26/22 13:37	
Toluene	ND U	0.50	1	04/26/22 13:37	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	73	68 - 117	04/26/22 13:37	
Dibromofluoromethane	103	73 - 122	04/26/22 13:37	
Toluene-d8	93	65 - 144	04/26/22 13:37	

Client:	RSEC Inc	**Service Request:**	K2204138
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Analyzed:**	04/26/22
Sample Matrix:	Water	**Date Extracted:**	NA

Duplicate Lab Control Sample Summary
Volatile Organic Compounds by GC/MS

Analysis Method:	8260C	**Units:**	ug/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	761999

	Lab Control Sample KQ2206919-03			Duplicate Lab Control Sample KQ2206919-04					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Benzene	11.9	10.0	119	10.8	10.0	108	69-124	10	30
Toluene	11.2	10.0	112	10.2	10.0	102	69-124	9	30

Client: RSEC Inc **Service Request:** K2204138

Project: Lanxess Kalama Chemical/LKC-0422

Sample Matrix: Water

SURROGATE RECOVERY SUMMARY
Semivolatile Organic Compounds by GC/MS SIM

Analysis Method: 8270D

Extraction Method: EPA 3520C

Sample Name	Lab Code	2-Fluorobiphenyl 48-114	p-Terphenyl-d14 22-146	Phenol-d6 38-107
USRW-2	K2204138-006	90	100	89
PDW-117	K2204138-007	92	99	98
KC-9	K2204138-008	87	100	85
Method Blank	KQ2206402-03	89	112	85
Lab Control Sample	KQ2206402-01	100	106	96
Duplicate Lab Control Sample	KQ2206402-02	97	106	94

Analytical Report

Client:	RSEC Inc	**Service Request:**	K2204138
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KQ2206402-03	**Basis:**	NA

Semivolatile Organic Compounds by GC/MS SIM

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Diphenyl Ether	ND U	1.0	1	05/06/22 23:18	4/25/22	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2-Fluorobiphenyl	89	48 - 114	05/06/22 23:18	
p-Terphenyl-d14	112	22 - 146	05/06/22 23:18	
Phenol-d6	85	38 - 107	05/06/22 23:18	

Client:	RSEC Inc	**Service Request:**	K2204138
Project:	Lanxess Kalama Chemical/LKC-0422	**Date Analyzed:**	05/06/22 - 05/07/22
Sample Matrix:	Water	**Date Extracted:**	04/25/22

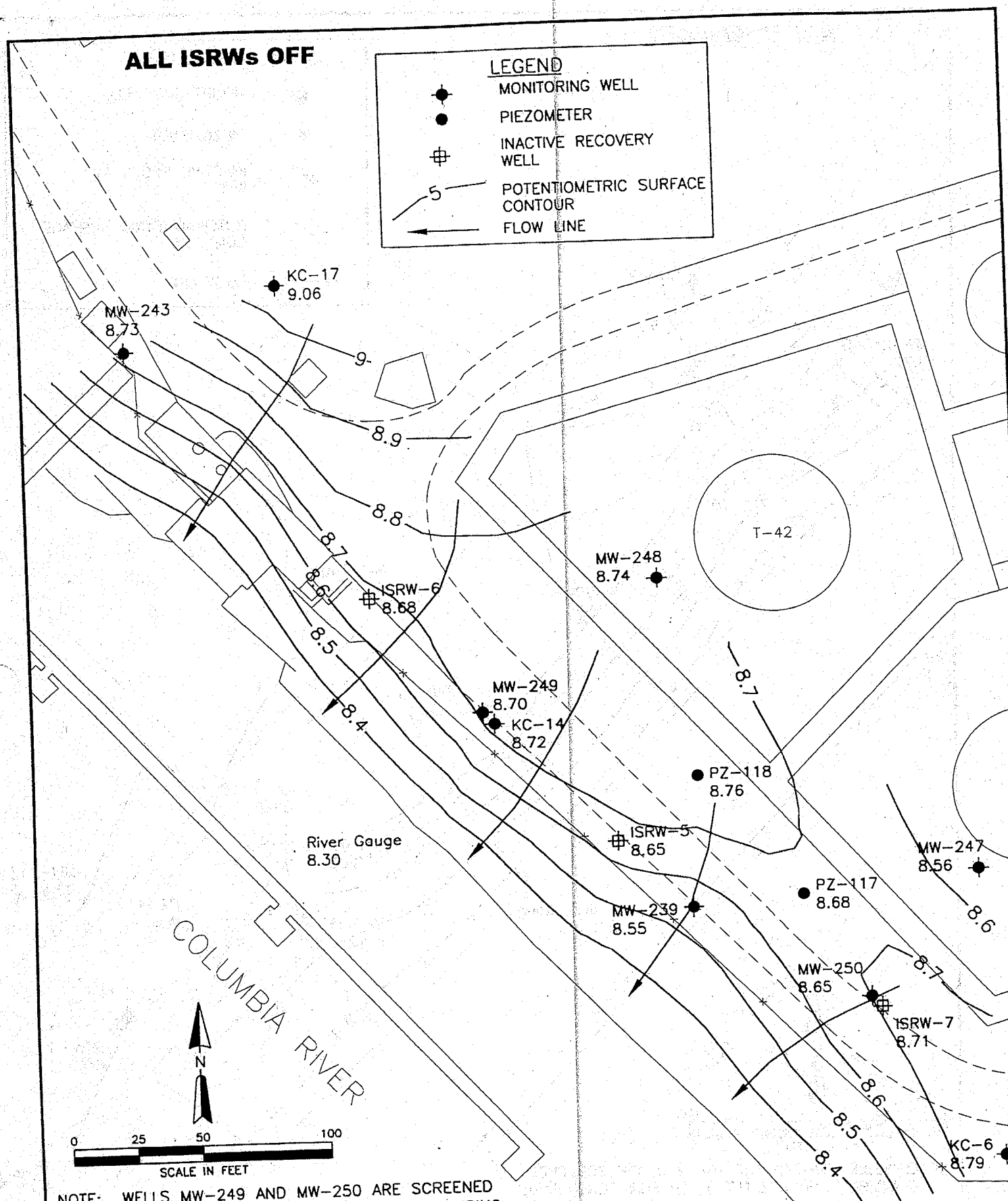
Duplicate Lab Control Sample Summary
Semivolatile Organic Compounds by GC/MS SIM

Analysis Method:	8270D	**Units:**	ug/L
Prep Method:	EPA 3520C	**Basis:**	NA
		Analysis Lot:	763330

	Lab Control Sample KQ2206402-01			Duplicate Lab Control Sample KQ2206402-02					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Diphenyl Ether	5.25	5.00	105	5.09	5.00	102	70-130	3	30

Appendix C

1998 ICM Annual Report, Section 4 Potentiometric Maps



NOTE: WELLS MW-249 AND MW-250 ARE SCREENED DEEPER AND ARE NOT USED FOR CONTOURING

REF DWG	DESC.							
1								
0	N.S.	3/31/98	DRAFT	J.P.	3/31/98			
NO	DRWN	DATE	REVISION	CHKD	DATE	APPVD	DATE	

KALAMA CHEMICAL FACILITY

3-2207-600

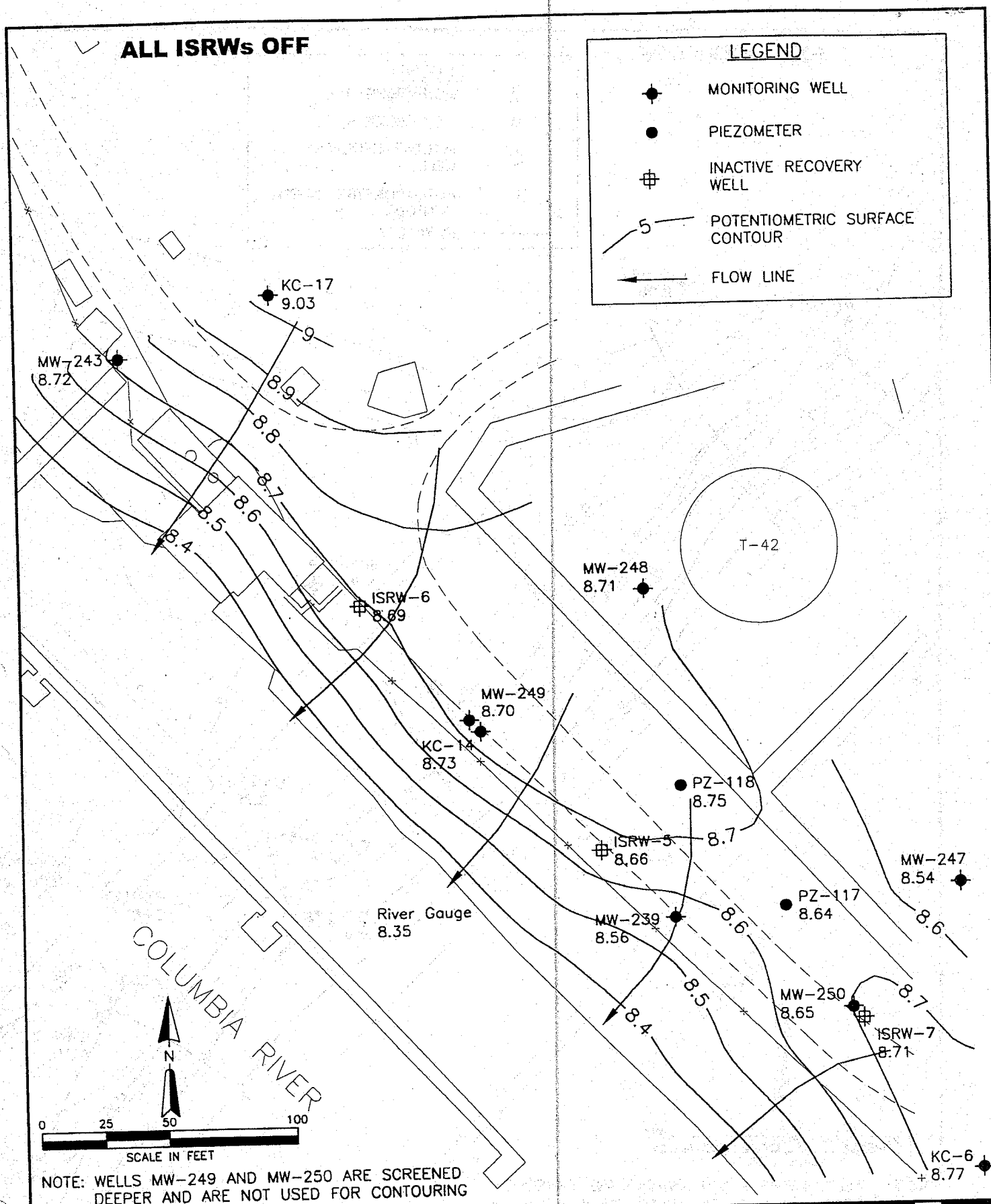
CUR. DATE: 4/3/98

CAD FILE 2207S341

INTERMEDIATE SAND AQUIFER
POTENTIOMETRIC SURFACE MAP
APRIL 4-7, 1997
72-HOUR MEAN

RETEC
REMEDIATION TECHNOLOGIES INC

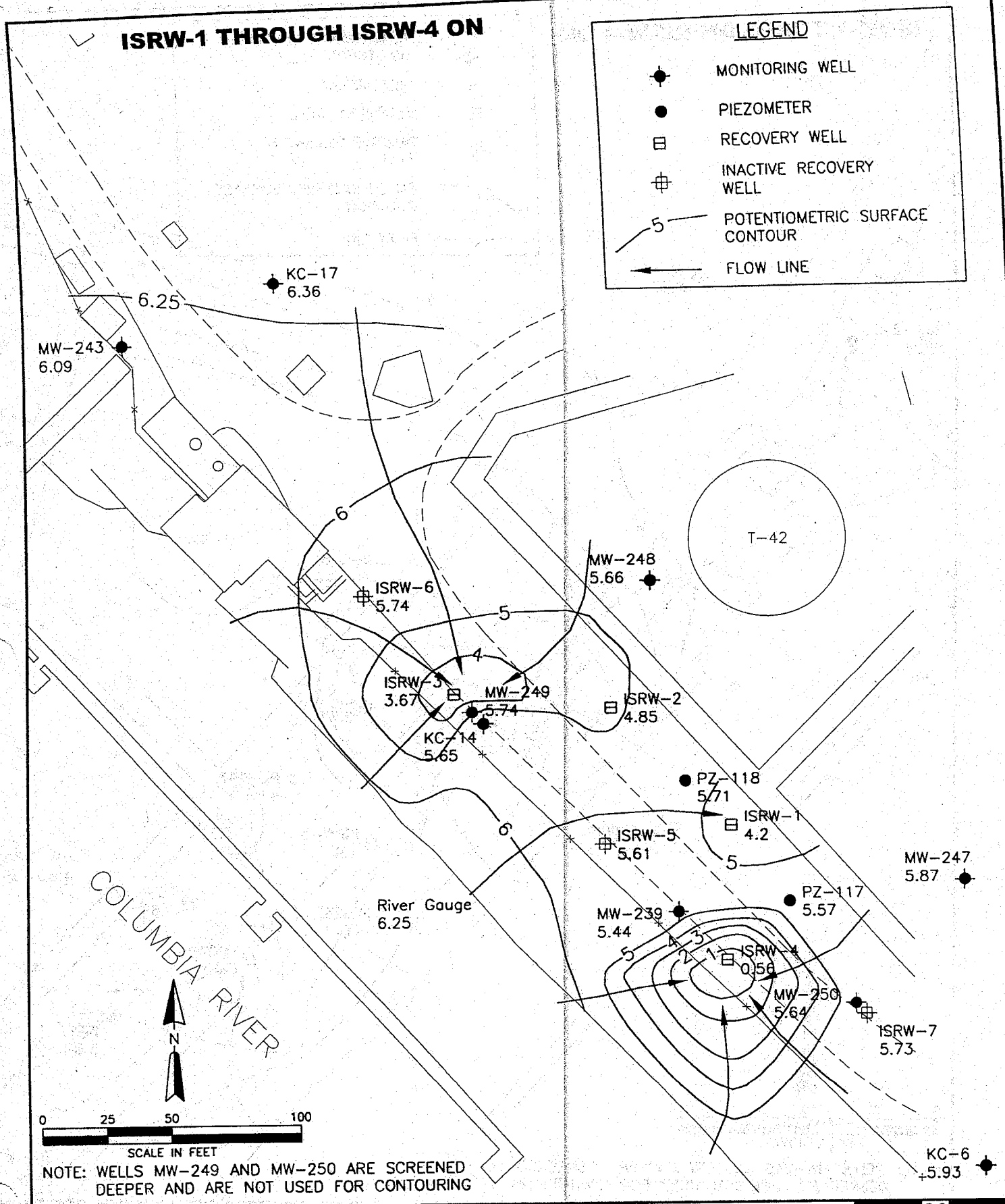
DRAWING NO. FIGURE 4-2a REV 0



NOTE: WELLS MW-249 AND MW-250 ARE SCREENED DEEPER AND ARE NOT USED FOR CONTOURING

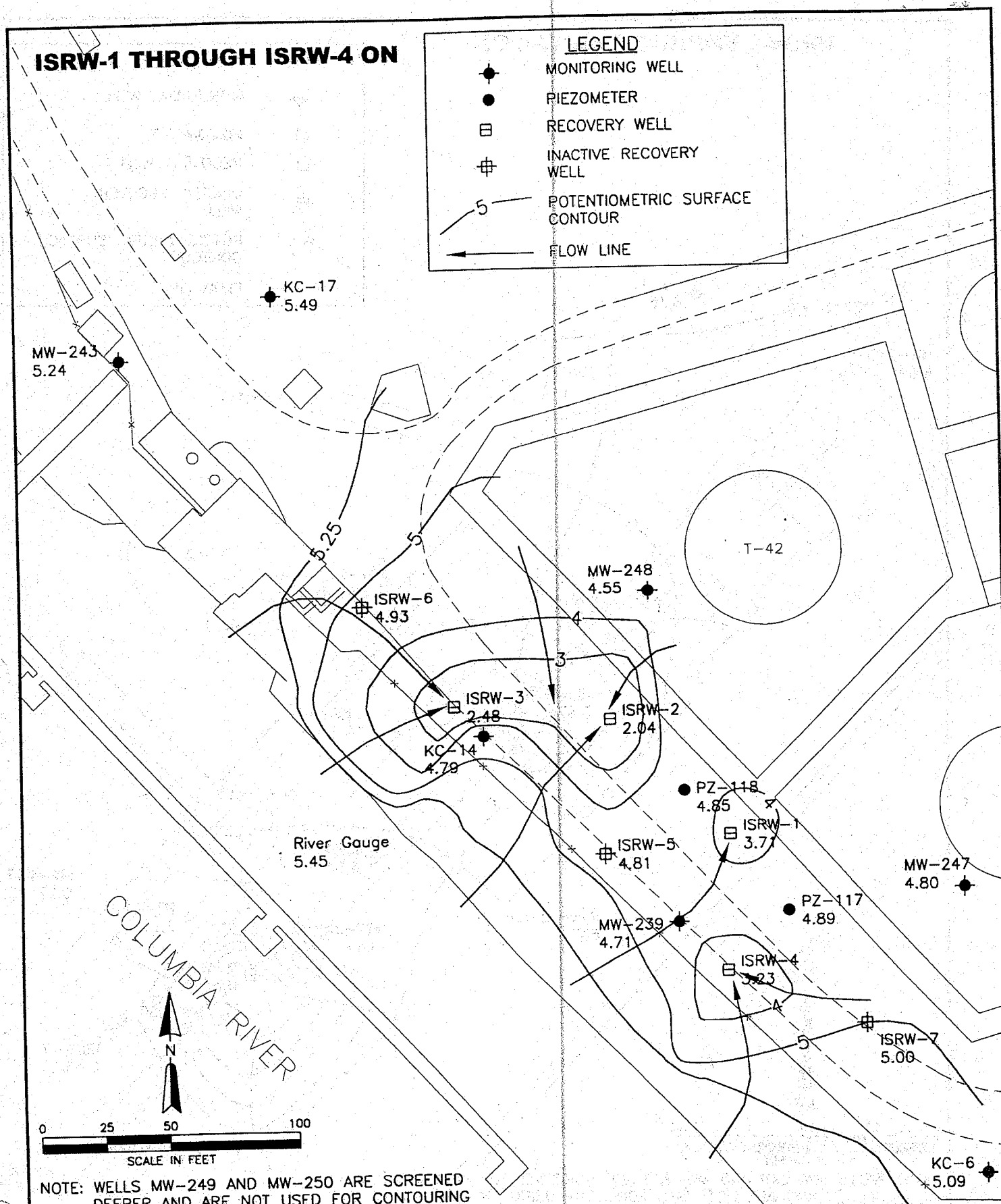
		KALAMA CHEMICAL FACILITY						CUR. DATE: 4/2/98	INTERMEDIATE SAND AQUIFER POTENTIOMETRIC SURFACE MAP APRIL 6, 1997 HIGH/LOW TIE AVERAGE	RETEC REMEDIATION TECHNOLOGIES INC
			3-2207-600							DRAWING NO. FIGURE 4-2b
REF DWG	DESC.									
1										
0	N.S.	3/31/98	DRAFT	J.P.	3/31/98					
NO	DRWN	DATE	REVISION	CHKD	DATE	APPVD	DATE	CAD FILE 2207S333		

ISRW-1 THROUGH ISRW-4 ON



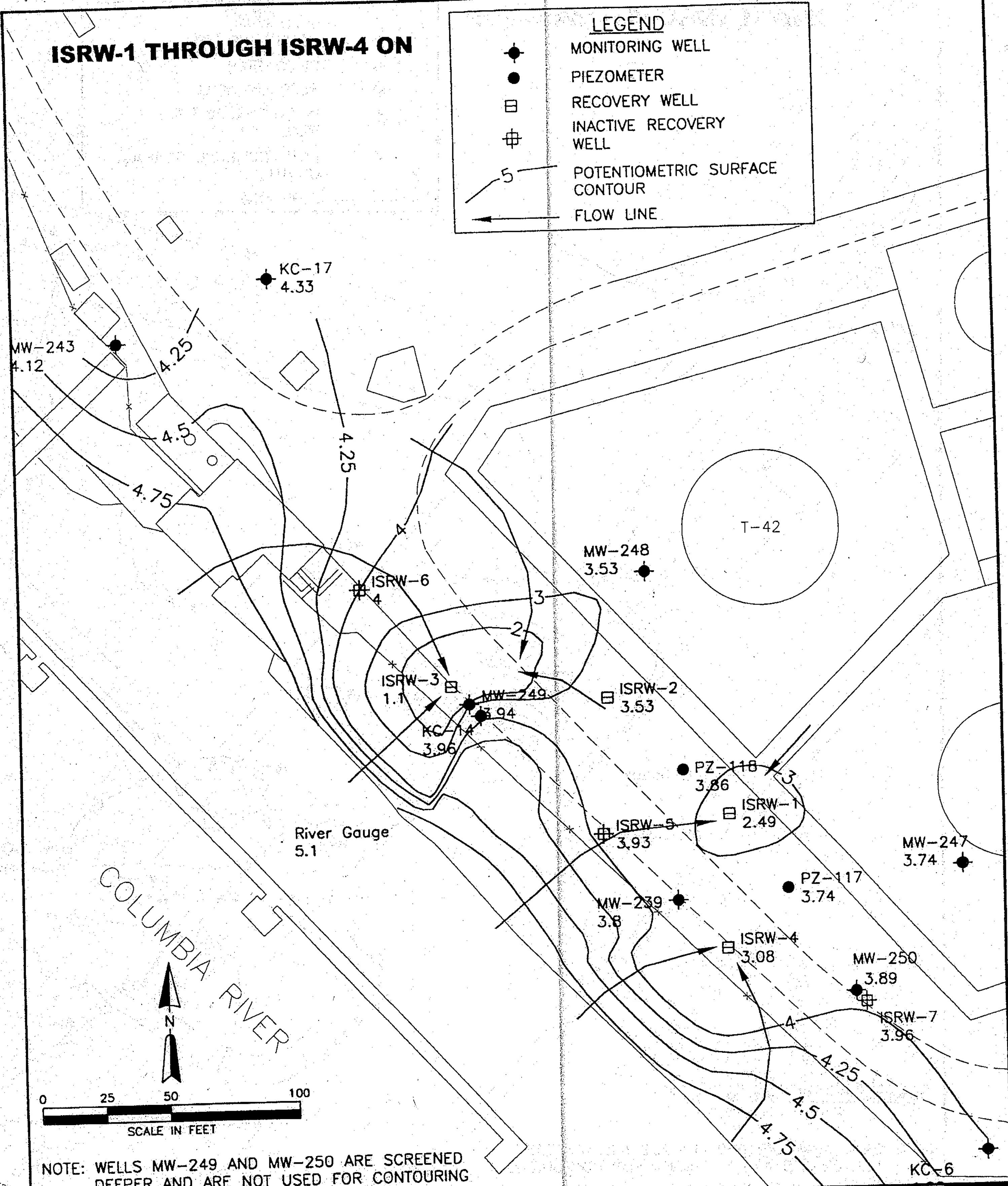
NOTE: WELLS MW-249 AND MW-250 ARE SCREENED DEEPER AND ARE NOT USED FOR CONTOURING

		KALAMA CHEMICAL FACILITY						CUR. DATE: 4/2/98		INTERMEDIATE SAND AQUIFER POTENTIOMETRIC SURFACE MAP JULY 14, 1997 HIGH/LOW TIDE AVERAGE	RETEC REMEDIATION TECHNOLOGIES INC
		3-2207-600									
REF DWG	DESC.										
1											
0	N.S.	3/31/98	DRAFT	J.P.	3/31/98						DRAWING NO. FIGURE 4-2e REV. 0
NO	DRWN	DATE	REVISION	CHKD	DATE	APPVD	DATE	CAD FILE	2207S329		



NOTE: WELLS MW-249 AND MW-250 ARE SCREENED DEEPER AND ARE NOT USED FOR CONTOURING

		KALAMA CHEMICAL FACILITY						CUR. DATE: 3/31/98	INTERMEDIATE SAND AQUIFER POTENTIOMETRIC SURFACE MAP AUGUST 28, 1997 HIGH/LOW TIE AVERAGE	REMEDIATION TECHNOLOGIES INC	
		3-2207-600								DRAWING NO.	REF
REF DWG	DESC.									FIGURE 4-2f	C
1											
0	N.S.	3/31/98	DRAFT		J.P.	3/31/98					
NO	DRWN	DATE	REVISION		CHKD	DATE	APPVD	DATE	CAD FILE: 2207S339		



KALAMA CHEMICAL FACILITY

3-2207-600

REF DWG	DESC.			
1				
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NO	DRWN	DATE	REVISION	

J.P. 3/31/98 CHKD DATE APPVD DATE

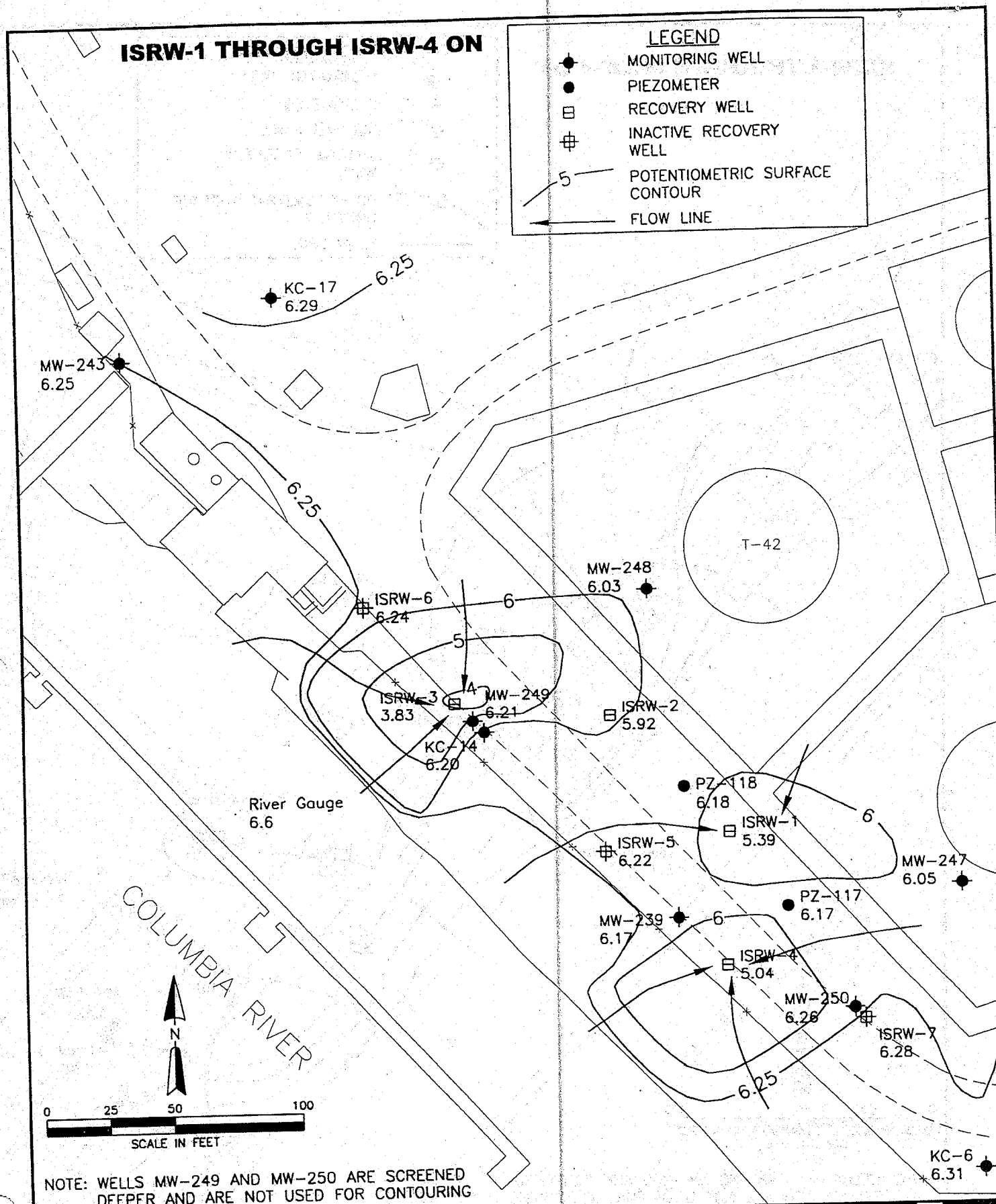
CUR. DATE: 3/31/98

CAD FILE 22075340

INTERMEDIATE SAND AQUIFER POTENTIOMETRIC SURFACE MAP SEPTEMBER 12, 1997 HIGH/LOW TIDE AVERAGE

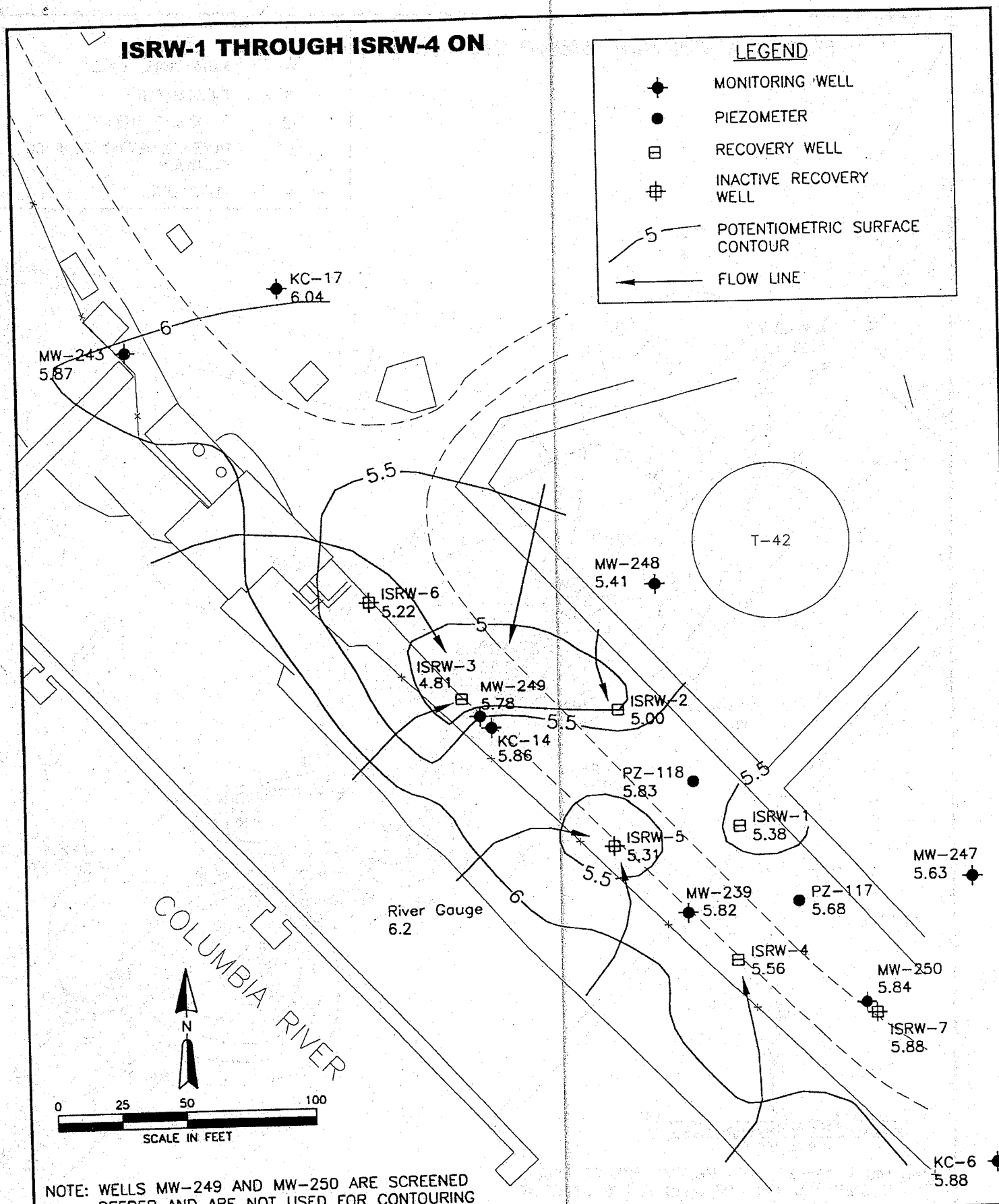
RETEC REMEDIATION TECHNOLOGIES INC

DRAWING NO. FIGURE 4-2g REV. 0



NOTE: WELLS MW-249 AND MW-250 ARE SCREENED DEEPER AND ARE NOT USED FOR CONTOURING

		KALAMA CHEMICAL FACILITY						CUR. DATE: 3/31/98	INTERMEDIATE SAND AQUIFER POTENTIOMETRIC SURFACE MAP OCTOBER 14, 1997 HIGH/LOW TIME AVERAGE	REMEDIATION TECHNOLOGIES INC
		3-2207-600								
REF DWG	DESC.									
1										
0	N.S.	3/31/98	DRAFT	J.P.	3/31/98					
NO	DRWN	DATE	REVISION	CHKD	DATE	APPVD	DATE	CAD FILE 2207S338		DRAWING NO. FIGURE 4-2h



REF OWG	DESC.	KALAMA CHEMICAL FACILITY						CUR. DATE: 4/2/98	INTERMEDIATE SAND AQUIFER POTENTIOMETRIC SURFACE MAP NOVEMBER 6-7, 1997 HIGH/LOW TIDE AVARAGE	REMEDIATION TECHNOLOGIES INC
1		3-2207-600								
0	N.S. 3/31/98	DRAFT		J.P.	3/31/98			CAD FILE 22075330		DRAWING NO. FIGURE 4-2i REV 0
NO	DRWN DATE	REVISION		CHKD	DATE	APPVD	DATE			