ANNUAL GROUNDWATER MONITORING REPORT CALENDAR YEAR 2023

(INCLUDES THIRD QUARTER 2023 SEMIANNUAL GROUNDWATER MONITORING REPORT)

HAZARDOUS WASTE MANAGEMENT UNITS (HWMUs) 5 AND 16

RADFORD ARMY AMMUNITION PLANT (RFAAP)
RADFORD, VIRGINIA

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ORGANIZATION OF REPORT

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EXECUTIVE SUMMARY

This document presents the Annual Groundwater Monitoring Report for calendar year 2023 for Hazardous Waste Management Units (HWMUs) 5 and 16 located at the Radford Army Ammunition Plant (RFAAP) in Radford, Virginia. The Annual Groundwater Monitoring Report was compiled in accordance with the requirements specified in the *Final Hazardous Waste Post-Closure Care Permit for HWMUs 5 and 16* (original effective date October 4, 2002; reissued August 16, 2014, with subsequent Class 1 Permit Modifications). This Annual Groundwater Monitoring Report evaluates the analytical data from Second Quarter 2023 and Third Quarter 2023 for each Unit.

The calendar year 2023 groundwater monitoring events were conducted using revised Permit-specified method detection limits (MDLs) (a.k.a., detection limits (DLs)) and quantitation limits (QLs) as presented in the recent Class 1 Permit Modification approved by the Virginia Department of Environmental Quality (VDEQ) in electronic correspondence dated May 5, 2021. A Unit-specific summary for the Second and Third Quarter 2023 semiannual groundwater monitoring events is provided below.

HWMU-5

HWMU-5 has been in corrective action (CA) since 2010. Semiannual CA groundwater monitoring events for HWMU-5 were conducted in accordance with Permit Module VI – *Groundwater Corrective Action & Monitoring Program for Unit 5*. Semiannual monitoring was conducted during Second and Third Quarter 2023.

Trichloroethene (TCE) was not detected at concentrations greater than the groundwater protection standard (GPS) of 5 ug/l during calendar year 2023. TCE was detected at concentrations greater than the Permit-specified QL of 1 ug/l but less than the GPS of 5 ug/l during the semiannual monitoring events in point of compliance wells 5WC22 and 5WC23 (Second and Third Quarter 2023). TCE was not detected at concentrations greater than the Permit-specified QL in any other wells comprising the CA monitoring network during the calendar year 2023 monitoring events. Additionally, no TCE daughter products were detected in any wells comprising the CA groundwater monitoring network for HWMU-5.

Total cobalt was detected at concentrations greater than the GPS of 7 ug/l in point of compliance wells 5WC21 and 5WC22 during Second and Third Quarters 2023. Total cobalt was not detected at concentrations greater than the GPS in any other wells comprising the CA monitoring network during the calendar year 2023 monitoring events.

Overall, evaluation of calendar year 2023 data for the CA Targeted Constituents and comparison with historical data indicates effective progress of groundwater CA through natural attenuation. TCE remedial endpoints have been achieved. No changes to the continuation of the groundwater CA program are anticipated at this time. Semiannual groundwater monitoring will continue at HWMU-5, with the next monitoring event scheduled for Second Quarter 2024.

The current CA groundwater monitoring program is required to continue until the TCE concentrations have remained below the GPS for a period of three consecutive years; upon which the Permittee may request to end corrective action. However, although TCE concentrations in groundwater at the Unit have been less than the GPS for over three consecutive years, total cobalt (listed in Appendix J to Permit Attachment 2 – *Groundwater Corrective Action Targeted Constituents - GPS and Semiannual Monitoring List for HWMU-5*) remains above the GPS in point of compliance wells 5WC21 and 5WC22. As a result, continued CA groundwater monitoring is required as stated in Permit Condition VI.B.4.c.

As stated in the Permit, the compliance period for HWMU-5 was scheduled to end October 28, 2020, and the 30-year post closure care period was scheduled to end on October 26, 2019. However, even though the TCE remedial endpoints have been achieved for over three consecutive years, the Permit requires the Unit to continue CA past the scheduled end of the compliance period and the post-closure care period due to the continued detection of total cobalt at concentrations greater than the GPS. It should be noted that the VDEQ previously approved Alternate Source Demonstrations (ASDs) for total cobalt in groundwater at RFAAP HWMUs 7 and 16 which demonstrated that total cobalt concentrations greater than the GPS at RFAAP are attributable to natural geologic conditions. The total cobalt concentrations in groundwater detected at HWMUs 7 and 16 were similar to or greater than those detected at HWMU-5.

RFAAP is currently in the process of preparing the Permit renewal application for the Unit.

HWMU-16

Semiannual Compliance groundwater monitoring for HWMU-16 was conducted during Second and Third Quarter 2023. On October 26, 2018, VDEQ authorized the comparison of total cobalt results in HWMU-16 point of compliance wells to the latest VDEQ alternate concentration limit (ACL; 6 ug/l during calendar year 2023) in addition to the Permit-specified GPS of 5 ug/l. During Second and Third Quarter 2023, total cobalt was detected at concentrations greater than the GPS in point of compliance wells 16MW9 and 16WC1A. During Second and Third Quarter 2023, total cobalt was detected

at a concentration greater than the VDEQ ACL in point of compliance well 16WC1A only. Total cobalt was not detected at concentrations greater than the GPS or latest VDEQ ACL in the other wells comprising the compliance monitoring network. Additionally, the total cobalt data were evaluated using the revised ASD for total cobalt in groundwater at HWMU-16 for point of compliance wells 16MW9, 16WC1A, and 16WC1B approved by the VDEQ in electronic correspondence dated September 13, 2021. Based on the conclusions of the VDEQ-approved ASD, calendar year 2023 total cobalt concentrations detected in point of compliance wells 16MW9 and 16WC1A appear to be consistent with natural variation in local groundwater and are not indicative of a release from the Unit. Based on the VDEQ correspondence dated September 13, 2021, a separate ASD will not be required. No other constituents were detected in the upgradient well or in the point of compliance wells at concentrations greater than their respective GPS during Second or Third Quarter 2023.

Evaluation of the plume monitoring well data indicated that total barium concentrations greater than the site-specific background concentration were detected in plume monitoring wells 16-2, 16-3, 16-5 and in spring sampling location 16SPRING during Second Quarter and Third Quarter 2023. Higher total barium concentrations in downgradient plume monitoring wells relative to background are likely due to natural variations in trace element distribution in groundwater. Upgradient well 16C1 is screened in limestone while downgradient plume monitoring wells 16-2, 16-3, and 16-5 are screened in shale and fault breccia. Such differing lithologic formations would be expected to contain very different trace element distributions. Similar barium concentrations were observed in the point of compliance wells. Therefore, no further action regarding the calendar year 2023 total barium concentrations detected in plume monitoring wells 16-2, 16-3, 16-5 and in spring sampling location 16SPRING is recommended at this time.

The Third Quarter 2023 event also served as the annual monitoring event in which the upgradient and point of compliance wells at HWMU-16 were sampled for the 40 CFR Part 264 Appendix IX constituents listed in Permit Attachment 1, Appendix I. Total silver was confirmed in point of compliance well 16WC1B and as a result will be added to the HWMU-16 Compliance Monitoring List (Appendix E of Permit Attachment 3). Additionally, since the constituent is listed in Appendix VIII to 40 CFR, as required by the Permit, total silver will be added to the Groundwater Protection Standard (GPS) list (Appendix G of Permit Attachment 3). A Class 1 Permit Modification to add total silver to the Groundwater Monitoring Compliance list for HWMU-16 will be submitted to VDEQ.

Additionally, RFAAP has collected total silver data from HWMW-16 upgradient monitoring well 16C1 during the past 21 annual Appendix IX groundwater monitoring events (2003-2023). Total silver has never been detected at or above the Permit-

specified QL in upgradient well 16C1 during the Compliance Monitoring Program; therefore, in lieu of quarterly background monitoring, RFAAP proposes to use these data to redefine the background value for total silver as the Permit-specified QL of 2 ug/l. Additionally, there is no USEPA Maximum Contaminant Level (MCL) for total silver; therefore, RFAAP proposes to use the latest (effective January 12, 2023) VDEQ ACL for total silver of 94 ug/l as the GPS.

No other additional 40 CFR Part 264 Appendix IX constituents (as listed in Appendix I of Permit Attachment 1) were detected at concentrations greater than their respective Permit MDLs.

In correspondence dated April 19, 2023, the VDEQ authorized continued use of the Permit-specified and historical laboratory DL of 50 ug/l for 2-propanol during annual monitoring of the constituents listed in Appendix I of Permit Attachment 1.

As stated in Permit Condition I.K.2, the compliance period during which the GPS applies to HWMU-16 is 13 years, beginning on the effective date of the original Final Permit and continuing until October 4, 2015, or until directed by VDEQ. Additionally, the 30-year post closure care period for HWMU-16 was scheduled to end on August 10, 2023. RFAAP is currently in the process of preparing the Permit renewal application for the Unit.

With the exception of the anticipated addition of total silver to the Compliance Monitoring List, no changes to the continuation of the groundwater program are anticipated at this time. Semiannual groundwater monitoring will continue at HWMU-16, with the next monitoring event scheduled for Second Quarter 2024.

1.0 INTRODUCTION

This document presents the Annual Groundwater Monitoring Report for calendar year 2023 for Hazardous Waste Management Units (HWMUs) 5 and 16 located at the Radford Army Ammunition Plant (RFAAP) in Radford, Virginia. The Annual Groundwater Monitoring Report was compiled in accordance with the requirements specified in the *Final Hazardous Waste Post-Closure Care Permit for HWMUs 5 and 16* (Final Permit; original effective date October 4, 2002; reissued August 16, 2014; revised in VDEQ-approved Class 1 Permit Modifications dated September 12, 2014, December 1, 2016, and May 5, 2021). Additionally, the calendar year 2023 groundwater monitoring events were conducted using revised detection limits (DLs) and quantitation limits (QLs) as approved by the Virginia Department of Environmental Quality (VDEQ) in electronic correspondence dated May 5, 2021.

The Annual Groundwater Monitoring Report presents the following set of information for each Unit: basic information and unit identification, a description of the groundwater monitoring plan, a discussion of groundwater movement, potentiometric surface maps, a table of groundwater elevations, and evaluations of the analytical data.

The groundwater samples collected at HWMUs 5 and 16 during the Second and Third Quarter 2023 semiannual monitoring events were evaluated in accordance with the reissued Final Permit dated August 16, 2014, and applicable permit modifications.

1.1 HWMU-5

HWMU-5 is a closed lined neutralization pond. The Unit received certification for closure in 1989. As stated in Permit Condition I.K.1, the Compliance Period during which the GPS applies to HWMU-5 is 19 years, beginning on the effective date of the original Post-Closure Care Permit for HWMU-5 (October 28, 2001) and continuing until October 28, 2020, or until directed by VDEQ. The Second Quarter 2010 groundwater monitoring event served as the first semiannual Corrective Action (CA) groundwater monitoring event for HWMU-5 conducted in accordance with Permit Module VI – *Groundwater Corrective Action & Monitoring Program for Unit 5*.

1.2 HWMU-16

HWMU-16 is a closed hazardous waste landfill. The Unit received closure certification in 1993. As stated in Permit Condition I.K.2, the Compliance Period during which the Groundwater Protection Standard applies to HWMU-16 is 13 years, beginning on the original effective date of the Permit (October 4, 2002) and continuing until October 4, 2015, or until directed by VDEQ.

2.0 HWMU-5 ANNUAL GROUNDWATER MONITORING REPORT

2.1 Waste Management Unit Information

Unit Name: Hazardous Waste Management Unit 5 (HWMU-5)
Owner/Operator: United States Army/BAE Systems, Ordnance Systems Inc.

Unit Location: RFAAP Main Plant Area, Radford, Virginia

Class: Hazardous Waste Management Unit
Type: Closed Lined Neutralization Pond

2.2 Groundwater Monitoring Plan

Monitoring Network:

Upgradient Well:	5W8B
Point of Compliance Wells:	5W5B, 5W7B, 5WC21, 5WC22, 5WC23
Plume Monitoring Wells:	5W12A
Observation Wells:	S5W5, S5W7, 5W9A, 5W10A, 5W11A, 5WCA, S5W6, S5W8, 5WC11, 5WC12

Monitoring Status: Corrective Action Monitoring Program

Calendar Year (CY) Monitoring Events:

Second Quarter 2023:	May 10, 2023
Third Quarter 2023:	July 25, 2023

HWMU-5 has been in corrective action (CA) since 2010. The calendar year 2023 groundwater monitoring events were conducted in accordance with Permit Module VI – *Groundwater Corrective Action & Monitoring Program for Unit 5*. Semiannual monitoring was conducted during Second and Third Quarter 2023.

2.3 Groundwater Movement

The monitoring wells at HWMU-5 are screened entirely within either weathered carbonate bedrock residuum or alluvium or across the weathered residuum/carbonate bedrock interface. The static water level measurements gathered during the 2023 semiannual monitoring events are summarized in **Table 1**. The maximum groundwater elevation fluctuation of approximately 1.94 feet was observed at observation well 5WC12; a minimum groundwater elevation fluctuation of 0.02 feet was observed at

observation wells 5WC11 and S5W6. On average, the groundwater elevation at Unit 5 fluctuated 0.26 feet, which is less than the expected annual fluctuation (2 to 5 feet) discussed in the Permit. As shown on the HWMU-5 Potentiometric Surface Maps (**Appendix A-1**), groundwater movement beneath the site is generally to the north/northeast.

Darcian flow conditions were assumed for the alluvium, residuum, and carbonate bedrock beneath HWMU-5. As a result, the groundwater velocities were calculated by multiplying the hydraulic conductivity (determined from previously conducted slug tests) by the average hydraulic gradient across the site and dividing by an assumed effective porosity for the aquifer. The average hydraulic gradient was determined by superimposing three evenly spaced flow line vectors over the potentiometric surface map, measuring their lengths, calculating the head differential over the distances measured, and dividing the head differential by the length of the flow line vectors. The three calculated gradients were then averaged to a single value. Using this method, the average groundwater hydraulic gradient across the site based on Third Quarter 2023 groundwater elevations was calculated to be 0.0253 ft/ft. Historical slug test data for the site yielded an average hydraulic conductivity of 5.25×10^{-5} ft/second. This value is consistent with literature values for carbonate rock and for clayey, silty sand and gravel alluvium and residuum (Domenico and Schwartz, 1990).

The estimated groundwater velocity across the site was calculated to be approximately 2.30 ft/day or 840 ft/year based on the following:

- Average hydraulic conductivity of 5.25×10^{-5} ft/second.
- Average hydraulic gradient of 0.0253 ft/ft.
- Assumed effective porosity of 0.05, based on a representative range of porosities for carbonate rock, weathered residuum, and clayey, silty sand and gravel alluvium (Domenico and Schwartz, 1990).

The actual groundwater flow velocities in the carbonate bedrock may vary as much as one to two orders of magnitude from the velocity presented above depending on water level conditions and the distribution of solution features.

2.4 Groundwater Analytical Data Evaluation

During Second Quarter 2023 and Third Quarter 2023, all of the wells in the CA groundwater monitoring network were sampled for the constituents listed in Appendix J to Permit Attachment 2 (*Groundwater Corrective Action Targeted Constituents - GPS and*

Semiannual Monitoring List for HWMU-5). The Second Quarter 2023 event also served as the annual monitoring event in which the point of compliance wells at HWMU-5 were sampled for the constituents listed in Appendix K to Permit Attachment 2 (*Groundwater Corrective Action Annual Monitoring List*). The calendar year 2023 groundwater monitoring events were conducted using revised DLs and QLs approved by the VDEQ in electronic correspondence dated May 5, 2021.

The laboratory analytical results for the 2023 monitoring events are summarized in **Appendix A-2** (Groundwater Corrective Action Targeted Constituents - GPS and Semiannual Monitoring List) and in **Appendix A-3** (Groundwater Corrective Action Annual Monitoring List). Field measurements for indicator parameters are summarized in **Appendix A-4**. The complete laboratory certificates of analysis for the 2023 monitoring events are included in **Appendix C**. Results were reported by an accredited laboratory under the Virginia Environmental Laboratory Accreditation Program (VELAP) for the analytes, methods and matrix as reported on the certificate of analysis; a copy of the laboratory VELAP accreditation certificate is presented in **Appendix C**. The analytical data were validated in accordance with SW-846, *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*, and *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*; data validation reports for HWMU-5 are included in **Appendix C**. Copies of field notes recorded during sample collection are included in **Appendix D**. Copies of correspondence relating to groundwater monitoring activities conducted at HWMU-5 during calendar year 2023 are included in **Appendix E**.

2.4.1 Semiannual Monitoring for Corrective Action Targeted Constituents

During the Second Quarter 2023 and Third Quarter 2023 monitoring events, groundwater samples collected from all of the wells in the CA groundwater monitoring network were analyzed for the CA Targeted Constituents listed in Appendix J to Permit Attachment 2. The CA Targeted Constituents consist of TCE and its daughter products: 1,1-dichloroethene (1,1-DCE), *cis*-1,2-dichloroethene (*c*DCE), *trans*-1,2-dichloroethene (*t*DCE), and vinyl chloride (VC). In addition, the VDEQ added total cobalt to the list of CA Targeted Constituents during a meeting with RFAAP on May 4, 2011. The laboratory analytical results for the CA Targeted Constituents are summarized in **Appendix A-2**. For constituents listed in Appendix J, the laboratory reported QLs and DLs at the respective permit QL or DL presented in the Class 1 Permit Modification and approved May 5, 2021.

During Second Quarter 2023, TCE was detected in point of compliance wells 5WC22 and 5WC23 at concentrations of 1.6 ug/l and 1.8 ug/l, respectively, which are less than the Groundwater Protection Standard (GPS) of 5 ug/l (**Appendix A-2**). TCE

was detected in point of compliance well 5WC21 at a concentration less than the QL of 1 ug/l. TCE was not detected in any of the other wells in the CA groundwater monitoring network. Additionally, the TCE daughter products were not detected in any of the wells comprising the CA groundwater monitoring network.

During Third Quarter 2023, TCE was detected in point of compliance wells 5WC22 and 5WC23 at concentrations of 1.6 ug/l and 1.7 ug/l, respectively, which are less than the GPS of 5 ug/l (**Appendix A-2**). TCE was detected in point of compliance well 5WC21 at a concentration less than the QL of 1.0 ug/l. TCE was not detected in any of the other wells in the CA groundwater monitoring network. Additionally, the TCE daughter products were not detected in any of the wells comprising the CA groundwater monitoring network.

During Second Quarter 2023, total cobalt was detected in point of compliance wells 5WC21 and 5WC22 at concentrations of 25 ug/l and 12 ug/l, respectively, which are greater than the Unit-specific GPS of 7 ug/l. Total cobalt was detected in point of compliance well 5W7B at an estimated concentration less than the QL of 5 ug/l but greater than the DL of 1 ug/l (**Appendix A-2**). Total cobalt was not detected at concentrations greater than the GPS in the other wells comprising the CA monitoring network during Second Quarter 2023.

During Third Quarter 2023, total cobalt was detected in point of compliance wells 5WC21 and 5WC22 at concentrations of 27 ug/l and 26 ug/l, respectively, which are greater than the Unit-specific GPS of 7 ug/l. Total cobalt was detected in point of compliance wells 5W7B at a concentration of 6.7 ug/l which is greater than the QL of 5 ug/l but less than the Unit-specific GPS (**Appendix A-2**). Total cobalt was not detected at concentrations greater than the GPS in the other wells comprising the CA monitoring network during Third Quarter 2023.

2.4.2 Annual Monitoring List – Comparison to Groundwater Protection Standards

During Second Quarter 2023, groundwater samples collected from the point of compliance wells for HWMU-5 were analyzed for the constituents listed in Appendix K to Permit Attachment 2 (*Groundwater Corrective Action Annual Monitoring List*; revised in Class 1 Permit Modification approved by VDEQ on May 5, 2021). Appendix K constituents are based on the Compliance Monitoring List, plus those constituents historically detected. Annual monitoring for the constituents listed in Appendix K is required in order to evaluate whether additional hazardous constituents that are not the targets for the current CA (e.g., TCE and its daughter products, total cobalt) are present at concentrations greater than their respective GPS for the Unit. No additional hazardous constituents that are not targets for the current CA for the Unit were

detected at concentrations greater than their respective GPS during Second Quarter 2023 (**Appendix A-3**).

The Second Quarter 2023 annual groundwater monitoring event was conducted using QLs and DLs presented in the Class 1 Permit Modification approved by the VDEQ in electronic correspondence dated May 5, 2021. For diethyl ether (only listed in Appendix K), the laboratory reported a QL (13 ug/l) slightly greater than the respective Permit-specified QL (12.5 ug/l) as a result of laboratory rounding. The laboratory QL was below the GPS of 7,300 ug/l, and no diethyl ether concentrations were detected above the respective GPS.

2.4.3 Annual Monitoring List – Verification of Estimated Values

A footnote presented in Appendix K to Permit Attachment 2 indicates that verification is required for constituents detected at concentrations less than the QL if their associated GPSs are 1) based on background values equal to the QL, and 2) are greater than the applicable risk-based concentrations (i.e., VDEQ Alternate Concentration Limit (ACL) or USEPA Regional Screening Level (RSL)). In these instances, verification must be conducted using an alternate low-level analytical method in order to confirm or refute the observed initial detections if the QL achievable by that method is less than, or equal to, the ACL or RSL for the subject constituent. If a concentration greater than the low-level analytical method QL is observed above the ACL or RSL, then a revised background concentration will be established using the low-level analytical method, if appropriate, and the GPS for that constituent will be updated, if warranted. This applies to p-nitroaniline and nitrobenzene only.

During Second Quarter 2023, p-nitroaniline (which has a GPS based on a background value equal to the Permit-specified QL) was not detected and no additional action was required.

Nitrobenzene was initially detected in point of compliance wells 5WC22 and 5WC23 at concentrations less than the Permit-specified QL of 10 ug/l. However, no additional action was required since there is no alternate low-level analytical method to confirm or refute the observed initial detections where the QL by that method is less than, or equal to the current ACL or RSL for nitrobenzene. For nitrobenzene, the current associated ACL (effective January 12, 2023) is 0.14 ug/l and current RSL (current as of November 2023) is 0.14 ug/l.

2.4.4 2023 USEPA Regional Screening Levels (RSLs)

The USEPA periodically updates the RSLs (formerly known as RBCs). As stated in section VI.E.3 of Module VI of the Final Permit, "The Permittee shall use the most up-to-date USEPA MCL, the Department ACL, or EPA Region 3 RBC as the GPS. If USEPA implements any changes to MCLs or RBCs, the GPS defined by that MCL or RBC will be updated to reflect the most current value established by USEPA."

At the time of the Second Quarter 2023 groundwater monitoring event, the May 2023 USEPA RSL table reflected the most current RSL values. According to the May 2023 USEPA RSL table, the RSL for diethyl ether (CAS Number 60-29-7) was 3,900 ug/l (target hazard quotient (THQ)=1.0, target risk (TR)=1E-06); the Permit-specified GPS for diethyl ether listed in Appendix K to Permit Attachment 2 is based on a previous RSL of 7,300 ug/l. The GPS comparison value for diethyl ether listed in Appendix A-2 of this report is the Permit-specified GPS of 7,300 ug/l; however, RFAAP also compared diethyl ether concentrations detected during Second Quarter 2023 to the current (as of November 2023) USEPA RSL of 3,900 ug/l. Diethyl ether is the only constituent listed in Appendix K to Permit Attachment 2 whose GPS is based on a previous USEPA RSL that has been updated subsequent to the Permit reissuance date of August 16, 2014.

During Second Quarter 2023, diethyl ether was not detected at or above the laboratory QL of 13 ug/l. Diethyl ether was detected below the QL of 13 ug/l in point of compliance well 5WC23 at an estimated concentration of 1.3 ug/l. The detected diethyl ether estimated concentration is less than the GPS listed in Appendix K to Permit Attachment 2 (7,300 ug/l) as well as the current USEPA RSL of 3,900 ug/l. Diethyl ether was not detected in any other wells comprising the CA groundwater monitoring network.

2.5 Annual Evaluation of Effectiveness of Corrective Action

In accordance with Sections VI.B.6, VI.J.4.f and VI.J.4.g and other applicable sections of the Final Permit, RFAAP is required to perform an annual evaluation of the effectiveness of the Corrective Action Program (CAP) (monitored natural attenuation [MNA] program) for calendar year 2023. MNA is the current remedial measure implemented at the Unit to address TCE in groundwater at concentrations greater than the GPS.

As stated in the 2014-2022 Annual Groundwater Monitoring Reports for the Unit, (2022 Annual Report approved in VDEQ correspondence dated April 19, 2023; **Appendix E**) TCE remedial endpoints have been achieved. During Second Quarter 2023 and Third Quarter 2023, TCE was not detected at concentrations greater than its GPS in

any of the wells comprising the CA groundwater monitoring network for HWMU-5. Additionally, no daughter products of TCE were detected in any of the wells comprising the CA groundwater monitoring network for HWMU-5; therefore, TCE remedial objectives continue to be met.

During Second Quarter and Third Quarter 2023, TCE was detected in point of compliance wells 5WC22 and 5WC23 at concentrations less than the GPS of 5 ug/l, and at a concentration less than the QL of 1 ug/l in point of compliance well 5WC21. TCE was not detected in any other wells comprising the CA monitoring network during the calendar year 2023 monitoring events. In accordance with the Final Permit, calculation of the predicted MNA remedial timeframe is not applicable since TCE data remained below the GPS in 2023.

Total cobalt was detected at a concentration greater than the GPS of 7 ug/l in point of compliance wells 5WC21 and 5WC22 during Second Quarter 2023 and Third Quarter 2023. Total cobalt was not detected at concentrations greater than the GPS in the other wells comprising the CA monitoring network during the calendar year 2023 monitoring events.

2.6 Recommendations

TCE concentrations at HWMU-5 remained below the GPS throughout calendar year 2023 indicating achievement of TCE remedial endpoints. The current monitoring program is required to continue until the TCE concentrations have remained below the GPS for a period of three consecutive years; upon which the Permittee may request to end corrective action. However, although TCE concentrations in groundwater at the Unit have been less than the GPS for over three consecutive years, total cobalt remains above the GPS in point of compliance wells 5WC21 and 5WC22 and continued CA groundwater monitoring is required as stated in Permit Condition VI.B.4.c.

As stated in the Permit, the compliance period for HWMU-5 was scheduled to end October 28, 2020, and the 30-year post closure care period was scheduled to end on October 26, 2019. However, even though the TCE remedial endpoints have been achieved for over three consecutive years, the Permit requires the Unit to continue CA past the scheduled end of the compliance period and the post-closure care period due to the continued detection of total cobalt at concentrations greater than the GPS. It should be noted that the VDEQ previously approved Alternate Source Demonstrations (ASDs) for total cobalt in groundwater at RFAAP HWMUs 7 and 16 which demonstrated that total cobalt concentrations greater than the GPS at RFAAP are attributable to natural geologic conditions. The total cobalt concentrations in groundwater detected at HWMUs 7 and 16 were similar to or greater than those detected at HWMU-5.

RFAAP is currently in the process of preparing the Permit renewal application for the Unit.

No changes to the continuation of the groundwater CA program are anticipated at this time. Semiannual groundwater monitoring will continue at HWMU-5. The next monitoring event is scheduled for Second Quarter 2024.

3.0 HWMU-16 ANNUAL GROUNDWATER MONITORING REPORT

3.1 Waste Management Unit Information

Unit Name: Hazardous Waste Management Unit 16 (HWMU-16)
Owner/Operator: United States Army/BAE Systems, Ordnance Systems Inc.

Unit Location: RFAAP Main Plant Area, Radford, Virginia

Class: Hazardous Waste Management Unit
Type: Closed Hazardous Waste Landfill

3.2 Groundwater Monitoring Plan

Monitoring Network:

Upgradient Well:	16C1
Point of Compliance Wells:	16WC1A, 16WC1B, 16MW8, 16MW9
Plume Monitoring Wells:	16-2, 16-3, 16-5, 16WC2B, 16SPRING
Observation Wells:	16-1, 16WC2A, 16C3, 16CDH3

Monitoring Status: Compliance Monitoring Program

CY 2023 Monitoring Events:

Second Quarter 2023:	May 15-16, 2023
Third Quarter 2023:	July 26-27, 2023
	October 5, 2023 (verification event- total cyanide)
	October 17-18, 2023 (verification event- total silver)

The calendar year 2023 groundwater monitoring events for HWMU-16 were conducted in accordance with Permit Module V – *Groundwater Compliance Monitoring*. Semiannual monitoring was conducted during Second and Third Quarters 2023.

3.3 Groundwater Movement

The monitoring wells at HWMU-16 are screened entirely within either carbonate bedrock or weathered carbonate bedrock residuum, or across the residuum/bedrock interface. The static water level measurements gathered during the 2023 semiannual monitoring events are summarized in **Table 2**. The maximum groundwater elevation fluctuation of approximately 1.40 feet was observed at point of compliance well 16WC1B; the minimum groundwater elevation fluctuation of 0.00 feet was observed at

plume monitoring well 16-2. On average, the groundwater elevation at Unit 16 fluctuated 0.74 feet, which is less than the range of expected annual fluctuation (2 to 4 feet) discussed in the Permit. As shown on the HWMU-16 Potentiometric Surface Maps (**Appendix B-1**), groundwater movement beneath the site is generally to the northeast.

Darcian flow conditions were assumed for the weathered residuum and carbonate bedrock beneath HWMU-16. As a result, the groundwater velocities were calculated by multiplying the hydraulic conductivity (determined from previously conducted slug tests) by the average hydraulic gradient across the site and dividing by an assumed effective porosity for the aquifer materials. The average hydraulic gradient was determined by superimposing three evenly spaced flow line vectors over the potentiometric surface map, measuring their lengths, calculating the head differential over the distances measured, and dividing the head differential by the length of the flow line vectors. The three calculated gradients were then averaged to a single value. Using this method, the average groundwater hydraulic gradient across the site based on Third Quarter 2023 groundwater elevations was calculated to be 0.0881 ft/ft. Historical slug test data for the site yielded an average hydraulic conductivity of 7.87×10^{-5} ft/second. This value is consistent with literature values for carbonate rock and for clay and silt residuum (Domenico and Schwartz, 1990).

The estimated groundwater velocity across the site was calculated to be approximately 11.98 ft/day or 4,373 ft/year based on the following:

- Average hydraulic conductivity of 7.87×10^{-5} ft/second.
- Average hydraulic gradient of 0.0881 ft/ft.
- Assumed effective porosity of 0.05, based on a representative range of porosities for carbonate rock and clay and silt residuum (Domenico and Schwartz, 1990).

The actual groundwater flow velocities in the carbonate bedrock may vary as much as one to two orders of magnitude from the velocity presented above depending on water level conditions and the distribution of solution features.

3.4 Groundwater Analytical Data Evaluation

The groundwater samples collected from the compliance monitoring network during the 2023 semiannual monitoring events were analyzed for the constituents listed in Permit Attachment 3, Appendix E – *Groundwater Compliance Monitoring (Semiannual) Constituent List*. In addition, during Third Quarter 2023 groundwater samples were collected from the upgradient well and the point of compliance wells for annual

monitoring for the constituents listed in Permit Attachment 1, Appendix I – *Annual Groundwater Sampling Constituent List (Appendix IX 40 CFR Part 264)*. The calendar year 2023 groundwater monitoring events were conducted using revised DLs and QLs as presented in the Class 1 Permit Modification approved by the VDEQ in electronic correspondence dated May 5, 2021. Additionally, HWMU-16 total cobalt data were evaluated using the revised ASD for total cobalt in groundwater at HWMU-16 approved by the VDEQ in electronic correspondence dated September 13, 2021.

The laboratory analytical results for the 2023 monitoring events are included in **Appendix B-2** (point of compliance wells) and in **Appendix B-3** (plume monitoring wells). The established background values and the computations used to determine the background values are included in **Appendix B-4**. Field measurements for indicator parameters are summarized in **Appendix B-5**. The complete laboratory certificates of analysis for the 2023 monitoring events are included in **Appendix C**. Results were reported by an accredited laboratory under the VELAP for the analytes, methods and matrix as reported on the certificate of analysis; a copy of the laboratory VELAP accreditation certificate is presented in **Appendix C**. The analytical data were validated in accordance with SW-846, *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*, and *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*; data validation reports for HWMU-16 are included in **Appendix C**. Copies of field notes recorded during sample collection are included in **Appendix D**. Copies of correspondence relating to groundwater monitoring activities conducted at HWMU-16 during calendar year 2023 are included in **Appendix E**.

3.4.1 Annual Monitoring – Permit Attachment 1, Appendix I

During the Third Quarter 2023 monitoring event, groundwater samples were collected from the upgradient well and the point of compliance wells for annual monitoring for the constituents listed in Permit Attachment 1, Appendix I – *Annual Groundwater Sampling Constituent List (Appendix IX 40 CFR Part 264)*.

Four laboratories were utilized to complete the Annual Appendix IX groundwater monitoring event. The *final revised* laboratory analytical data packages for this event were received on November 14, 2023. The laboratory DLs and QLs met the Permit-specified MDLs and QLs.

As documented in the October 2, 2023, Groundwater Monitoring Event Notification letter (**Appendix E**), the following Appendix IX constituents were initially detected at estimated concentrations greater than their respective Permit DLs at HWMU-16 during the Third Quarter 2023 groundwater monitoring event:

Well Location	Constituent	Initial Concentration	Lab DL	Permit DL	Units
16WC1B	Total Silver	0.34 J	0.3	0.3	ug/l
16MW9	Cyanide	6.7 J	20	5	ug/l

Note: DL denotes detection limit.
J denotes analyte detected less than the quantitation limit (QL) and concentration is estimated.

Total Silver

The subsequent verification event to confirm or refute the total silver result in point of compliance well 16WC1B and the cyanide result in point of compliance well 16MW9 was conducted on October 5, 2023. During the October 5, 2023, verification monitoring event, point of compliance well 16WC1A was mistakenly sampled for total silver instead of point of compliance well 16WC1B. Point of compliance well 16WC1B was subsequently sampled for total silver on October 17-18, 2023. Final total silver results for point of compliance well 16WC1B and blind sample duplicate were received on October 27, 2023.

Verification sampling results confirm the presence of total silver in point of compliance well 16WC1B at an estimated concentration of 0.59 J ug/l; therefore, the original estimated total silver concentration of 0.34 J ug/l in point of compliance well 16WC1B is confirmed. Total silver will be added to the HWMU-16 Compliance Monitoring List (Appendix E of Permit Attachment 3). Additionally, since the constituent is listed in Appendix VIII to 40 CFR, as required by the Permit, total silver will be added to the Groundwater Protection Standard (GPS) list (Appendix G of Permit Attachment 3). RFAAP will submit a Class 1 Permit Modification to add total silver to the Groundwater Monitoring Compliance list for HWMU-16.

The Permit requires collection of four quarters of monitoring data from a Unit's upgradient well(s) to establish background values for newly detected Appendix IX constituents. Please note that the Compliance Monitoring List for HWMU-16 previously included total silver when the Permit was issued in 2002. The background value for total silver presented in the Permit at that time was calculated based on the laboratory method detection limit (MDL) rather than quantitation limit (QL) as presented in the August 1999 Groundwater Quality Assessment Report that was included in the Post-Closure Care Permit Application Part B for the Unit. The VDEQ removed total silver from the Compliance Monitoring List for HWMU-16 due to lack of detection with approval of the Class 3 Permit Modification dated September 27, 2011; however, annual monitoring

for total silver continued with the annual monitoring of constituents listed in 40 CFR Appendix IX. Therefore, RFAAP has collected total silver data from HWMU-16 upgradient monitoring well 16C1 during the past 21 annual Appendix IX groundwater monitoring events (2003-2023). Total silver has never been detected at or above the Permit-specified QL in upgradient well 16C1 during the Compliance Monitoring Program; therefore, in lieu of quarterly background monitoring, RFAAP proposes to use these data to redefine the background value for total silver as the Permit-specified QL of 2 ug/l. Additionally, there is no USEPA Maximum Contaminant Level (MCL) for total silver; therefore, we propose to use the latest (effective January 12, 2023) VDEQ Alternate Concentration Limit (ACL) for total silver of 94 ug/l as the Groundwater Protection Standard (GPS).

Cyanide

A verification event to confirm or refute the initial detection of cyanide in point of compliance well 16MW9 was conducted on October 5, 2023, and final results were received on October 18, 2023. The verification event results indicated cyanide was not detected at a concentration equal to or greater than the Permit DL in point of compliance well 16MW9; therefore, no additional action was required with respect to cyanide.

No additional 40 CFR Part 264 Appendix IX constituents (as listed in Appendix I of Permit Attachment 1) were detected at concentrations at or greater than their respective Permit MDLs in the samples collected from the point of compliance wells during Third Quarter 2023. VDEQ notification of the verification event results, which included analysis of a sample and sample duplicate, are included in **Appendix E**.

Additional Information

In correspondence dated June 12, 2019, the VDEQ authorized continued use of the historical laboratory DL of 50 ug/l for 2-propanol during annual monitoring of the constituents listed in Appendix I of Permit Attachment 1. However, VDEQ requested an annual survey of laboratories maintaining 2-propanol accreditation under the VELAP for a period of at least three (3) years (i.e., 2020, 2021, 2022) to verify that the lower DL of 18 ug/l for 2-propanol reported by ELLE of Lancaster, Pennsylvania during the Second Quarter 2019 monitoring event cannot be routinely achieved by other VELAP accredited laboratories. VDEQ also requested including this survey as an appendix in subsequent annual reports. A summary of the requested 2-propanol survey was presented in the 2022 Annual report. In correspondence dated April 19, 2023, the VDEQ accepted the survey as complete and authorized continued use of the historical laboratory DL of 50 ug/l for 2-propanol for future monitoring events.

3.4.2 Comparison to Groundwater Protection Standards

As specified in the Final Permit, the calendar year 2023 groundwater analytical data for the upgradient well and the point of compliance wells were compared to the GPS for HWMU-16 listed in Appendix G of Permit Attachment 3 (modified to add 1,1-dichloroethene in Class 1 Permit Modification approved September 12, 2014; modified to add tetrahydrofuran in Class 1 Permit Modification approved December 1, 2016; modified to add vinyl chloride in Class 1 Permit Modification approved May 5, 2021). In accordance with Permit Condition V.I.2, RFAAP performed a simple empirical comparison of the upgradient well and the point of compliance well data to the GPS (**Appendix B-2**).

During Second Quarter 2023, total cobalt was detected in point of compliance wells 16MW9 and 16WC1A at concentrations of 6.0 ug/l and 18 ug/l, respectively, which are greater than the Permit-specified GPS of 5 ug/l. During Third Quarter 2023, total cobalt was detected in point of compliance wells 16MW9 and 16WC1A at concentrations of 5.7 ug/l and 15 ug/l, respectively, which are greater than the Permit-specified GPS of 5 ug/l. As directed by the VDEQ in electronic correspondence dated October 26, 2018, RFAAP also compared the detected total cobalt concentrations to the latest (effective January 12, 2023) VDEQ ACL for cobalt of 6 ug/l. Additionally, the total cobalt data were evaluated using the revised ASD for total cobalt in groundwater at HWMU-16 for point of compliance wells 16MW9, 16WC1A, and 16WC1B approved by the VDEQ in electronic correspondence dated September 13, 2021. Based on the conclusions of the VDEQ-approved ASD, the calendar year 2023 total cobalt concentrations detected in point of compliance wells 16MW9 and 16WC1A appear to be consistent with natural variation in local groundwater and are not indicative of a release from the Unit. A verification event was not conducted for calendar year 2023 total cobalt concentrations detected in point of compliance wells 16MW9 and 16WC1A. As well, based on VDEQ correspondence dated September 13, 2021, a separate ASD will not be required.

Total cobalt was not detected at concentrations greater than the Permit-specified GPS or the latest VDEQ ACL in the other wells comprising the compliance monitoring network during the calendar year 2023 monitoring events.

No other constituents were detected in the upgradient well or in the point of compliance wells at concentrations greater than their respective GPS during Second and Third Quarter 2023.

A footnote presented in Appendix G of Permit Attachment 3 (*Groundwater Protection Standards: Unit 16*) indicates that verification is required for constituents detected at concentrations less than the QL if their associated GPS are equal to the QL and are greater than the applicable risk-based concentrations (i.e., ACL or RSL). In these instances, verification must be conducted using an alternate low-level analytical method in order to confirm or refute the observed initial detections if the QL achievable by that method is less than, or equal to, the ACL or RSL for the subject constituent. If a concentration greater than the low-level analytical method QL is observed, then the GPS for that constituent will be updated, if warranted. During Second Quarter 2023 and Third Quarter 2023, no constituents with GPS equal to their respective QLs and greater than the applicable risk-based concentrations were detected at concentrations less than their respective QLs; therefore, no further action was warranted. This applied to 2,4-dinitrotoluene and 2,6-dinitrotoluene.

3.4.3 Comparison to Background Concentrations

As specified in Permit Condition V.O, the calendar year 2023 groundwater analytical data for the plume monitoring wells were compared to the background concentrations for HWMU-16 listed in Appendix F of Permit Attachment 3. In accordance with Permit Condition V.I.2, RFAAP performed a simple empirical comparison of the plume monitoring well data to the background concentrations (**Appendix B-3**).

As shown in **Appendix B-3**, total barium was detected at concentrations greater than the site-specific background concentration of 175.4 ug/l in plume monitoring wells 16-2, 16-3 and 16-5 and in spring sampling location 16SPRING during Second Quarter and Third Quarter 2023. All total barium concentrations detected in the plume monitoring locations were well below the USEPA MCL for barium of 2,000 ug/l. Higher barium concentrations in downgradient plume monitoring wells relative to background may be the result of natural variations in trace element distribution in groundwater. As illustrated in the boring logs for the compliance network monitoring wells (Appendix H of Permit Attachment 5), upgradient well 16C1 is screened in limestone while downgradient plume monitoring wells 16-2, 16-3, and 16-5 are screened in shale and fault breccia. Such differing lithologic formations would be expected to contain different trace element distributions. In correspondence dated May 9, 2022, VDEQ acknowledged the presence of barium above the site-specific background concentration due to lithology. However, VDEQ may request further investigation if total barium levels in groundwater increase in the future. No further action regarding calendar year 2023 total barium concentrations detected in plume monitoring wells above the site-specific background concentration is recommended at this time.

During Third Quarter 2023, for sample 16SPRING, the reported adjusted laboratory quantitation limit for diethyl phthalate was 5.1 ug/l due to rounding associated with the final sample volume used for analysis. The permit QL and background concentration for diethyl phthalate is 5 ug/l. Diethyl phthalate was not detected at or above the adjusted QL of 5.1 ug/l in 16SPRING during Third Quarter 2023.

No other constituent concentrations detected in the plume monitoring wells were greater than their respective background concentration or applicable Permit-specified QL, as listed in Permit Appendix G to Attachment 3. In accordance with the requirements of Permit Condition V.K.3, the established background values and the computations used to determine the background values are included in **Appendix B-4**.

3.5 Recommendations

No further action regarding the 2023 total barium concentrations detected in plume monitoring wells 16-2, 16-3, and 16-5 and in spring sampling location 16SPRING is recommended at this time.

No further action regarding the 2023 total cobalt concentrations detected in point of compliance wells 16MW9 and 16WC1A is recommended at this time based on the recently approved total cobalt ASD.

Verification sampling results confirm the presence of total silver in point of compliance well 16WC1B. Total silver will be added to the HWMU-16 Compliance Monitoring List (Appendix E of Permit Attachment 3). Additionally, since the constituent is listed in Appendix VIII to 40 CFR, as required by the Permit, total silver will be added to the Groundwater Protection Standard list (Appendix G of Permit Attachment 3). RFAAP will submit a Class 1 Permit Modification to add total silver to the Groundwater Monitoring Compliance list for HWMU-16.

RFAAP has collected total silver data from HWMW-16 upgradient monitoring well 16C1 during the past 21 annual Appendix IX groundwater monitoring events (2003-2023). Total silver has never been detected at or above the Permit-specified QL in upgradient well 16C1 during the Compliance Monitoring Program; therefore, in lieu of quarterly background monitoring, RFAAP proposes to use these data to redefine the background value for total silver as the Permit-specified QL of 2 ug/l. Additionally, there is no USEPA Maximum Contaminant Level (MCL) for total silver; therefore, we propose to use the latest (effective January 12, 2023) VDEQ ACL for total silver of 94 ug/l as the GPS.

As stated in Permit Condition I.K.2, the compliance period during which the GPS applies to HWMU-16 is 13 years, beginning on the effective date of the original Final Permit (October 4, 2002) and continuing until October 4, 2015, or until directed by VDEQ. Additionally, the 30-year post closure care period for HWMU-16 was scheduled to end on August 10, 2023. RFAAP is currently in the process of preparing the Permit renewal application for the Unit.

With the exception of the anticipated addition of total silver to the Compliance Monitoring List, no other changes to the continuation of the groundwater program are anticipated at this time. Semiannual groundwater monitoring will continue at HWMU-16, with the next monitoring event scheduled for Second Quarter 2024.

SIGNATURE/CERTIFICATION

Prepared by:

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Signature:
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Address: 2200 South Main Street, Suite A
City/State/Zip: Blacksburg, Virginia 24060-6600

Prepared by:

Name: Will Mason-Deese Project Geologist

Signature:
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Address: 2200 South Main Street, Suite A
City/State/Zip: Blacksburg, Virginia 24060-6600

Virginia Professional Certification:

I certify that I have prepared or supervised preparation of the attached report, that it has been prepared in accordance with industry standards and practices, and that the information contained herein is truthful and accurate to the best of my knowledge.

Name: Michael D. Lawless, Principal Geologist

Signature:
Virginia Professional Certification Type and Number: PG 832
Company: TRC Engineers, Inc.
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City/State/Zip: Blacksburg, Virginia 24060-6600

TABLES

TABLE 1
HWMU-5
GROUNDWATER ELEVATIONS - 2023
RADFORD ARMY AMMUNITION PLANT
RADFORD, VIRGINIA

MONITORING WELL ID	ELEVATION TOP OF WELL	MAY 10, 2023		JULY 25, 2023	
		DTW	GW ELEV	DTW	GW ELEV
5W8B	1789.58	13.66	1775.92	13.58	1776.00
5W5B	1775.13	8.32	1766.81	7.91	1767.22
5W7B	1774.78	8.04	1766.74	7.98	1766.80
5WC21	1774.43	8.02	1766.41	7.98	1766.45
5WC22	1774.45	8.00	1766.45	7.94	1766.51
5WC23	1773.84	7.43	1766.41	7.37	1766.47
5W12A	1772.46	10.21	1762.25	9.98	1762.48
S5W5	1772.31	6.94	1765.37	6.74	1765.57
S5W7	1776.08	10.46	1765.62	10.50	1765.58
5W9A	1762.20	0.48	1761.72	0.54	1761.66
5W10A	1771.40	12.34	1759.06	12.39	1759.01
5W11A	1766.20	9.76	1756.44	8.79	1757.41
5WC11	1788.92	14.39	1774.53	14.41	1774.51
5WC12	1788.96	12.85	1776.11	14.79	1774.17
5WCA	1779.05	12.13	1766.92	11.99	1767.06
S5W6	1771.43	5.35	1766.08	5.33	1766.10
S5W8	1783.68	11.21	1772.47	11.09	1772.59

NOTES:
DTW: Depth to water from top of casing.
GW ELEV: Groundwater elevation.
All elevations in feet above mean sea level.

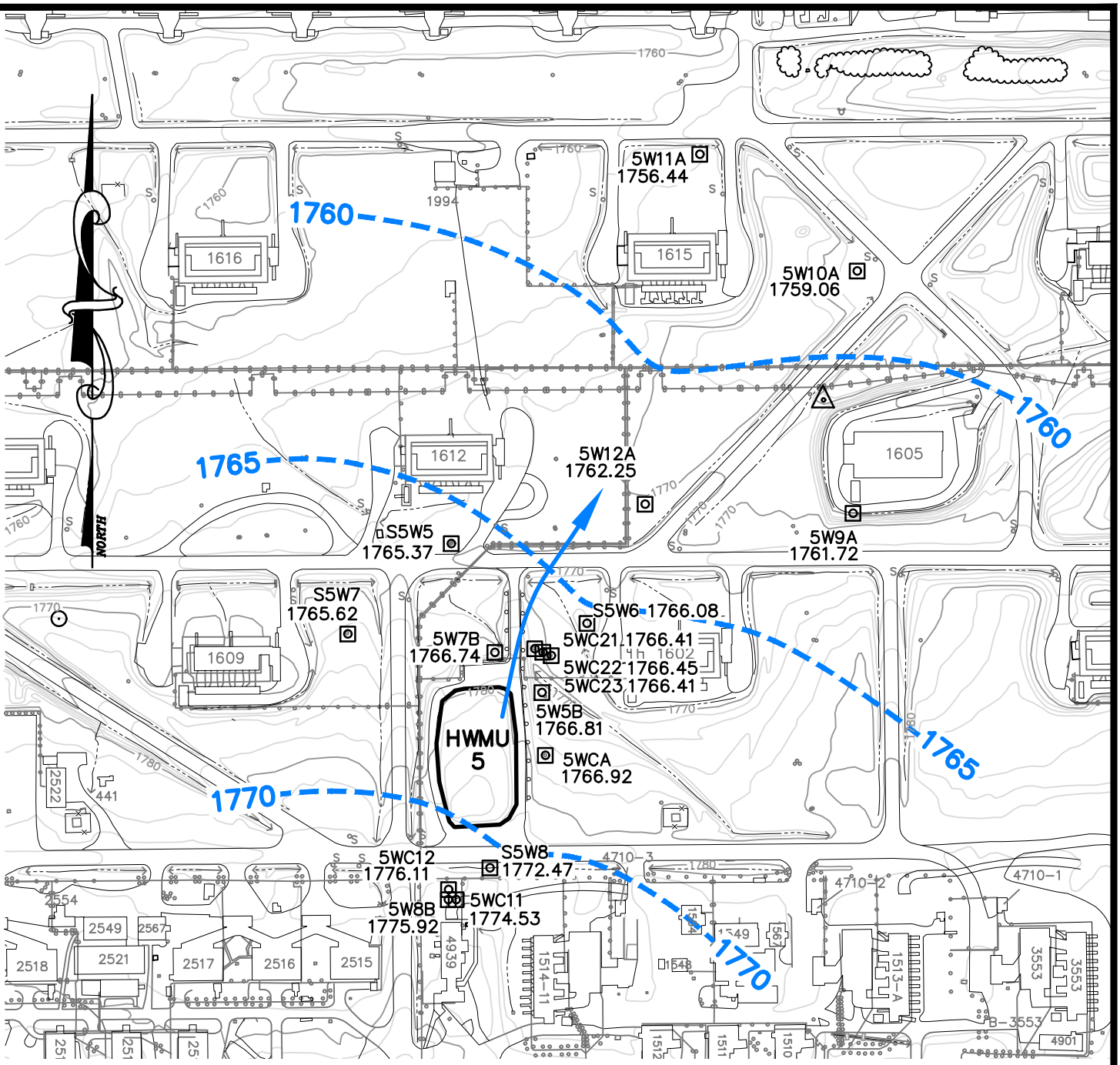
TABLE 2
HWMU-16
GROUNDWATER ELEVATIONS - 2023
RADFORD ARMY AMMUNITION PLANT
RADFORD, VIRGINIA

MONITORING WELL ID	ELEVATION TOP OF WELL	MAY 15-16, 2023		JULY 26, 2023	
		DTW	GW ELEV	DTW	GW ELEV
16C1	1840.14	47.42	1792.72	48.02	1792.12
16MW8	1815.82	72.44	1743.38	73.18	1742.64
16MW9	1808.88	63.57	1745.31	64.79	1744.09
16WC1A	1812.61	66.12	1746.49	67.46	1745.15
16WC1B	1812.95	66.31	1746.64	67.71	1745.24
16-1	1815.82	45.46	1770.36	44.21	1771.61
16-2	1810.99	55.82	1755.17	55.82	1755.17
16-3	1824.77	56.14	1768.63	56.03	1768.74
16-5	1742.60	4.00	1738.60	4.18	1738.42
16WC2B	1818.71	52.62	1766.09	53.09	1765.62
16WC2A	1820.05	DRY	DRY	DRY	DRY
16C3	1822.22	64.78	1757.44	65.65	1756.57
16CDH3	1825.60	DRY	DRY	DRY	DRY
SPRING	na	na	na	na	na

NOTES:
DTW: Depth to water from top of casing.
GW ELEV: Groundwater elevation.
All elevations in feet above mean sea level.
na: Not applicable.

APPENDIX A

HWMU-5



GRAPHIC SCALE

200 0 100 200 400

(IN FEET)

1 inch = 200 ft.

LEGEND

5W7B 1766.74 — MONITORING WELL GROUNDWATER ELEVATION (feet above mean sea level)

--1770-- GROUNDWATER CONTOUR

GROUNDWATER FLOW DIRECTION

NOTE: TOPOGRAPHIC CONTOUR INTERVAL 2'

HWMU-5 POTENTIOMETRIC SURFACE MAP (May 10, 2023)

RADFORD ARMY AMMUNITION PLANT

RADFORD, VIRGINIA

SCALE: 1"=200'

PLAN NO. 547076

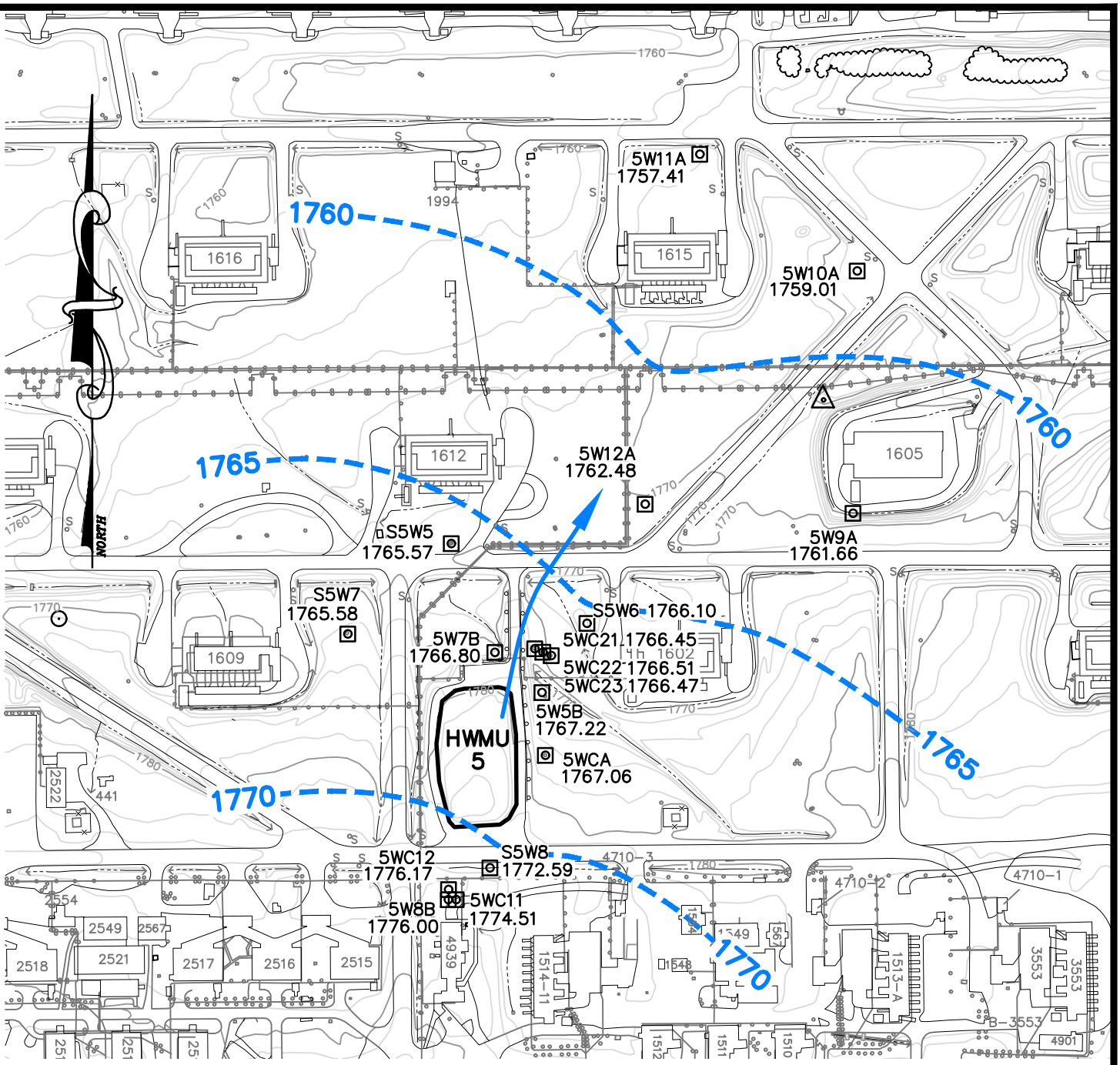
TRC ENGINEERS, INC.

2200 South Main Street, Suite A
Blacksburg, VA 24060
540-552-0444 Fax: 540-552-0291

Richmond, VA | Raleigh, NC
Charlottesville, VA | Northern Virginia
Newport News, VA | Virginia Beach, VA

DESIGNED	WMD
DRAWN	DLD
CHECKED	MDL
DATE	07/25/2023

FIGURE 1



GRAPHIC SCALE

200 0 100 200 400

(IN FEET)

1 inch = 200 ft.

LEGEND

5W7B 1766.80 — MONITORING WELL GROUNDWATER ELEVATION (feet above mean sea level)

--1770-- GROUNDWATER CONTOUR

GROUNDWATER FLOW DIRECTION

NOTE: TOPOGRAPHIC CONTOUR INTERVAL 2'

HWMU-5 POTENTIOMETRIC SURFACE MAP (July 25, 2023)

RADFORD ARMY AMMUNITION PLANT

RADFORD, VIRGINIA

SCALE: 1"=200'

PLAN NO. 547076

TRC ENGINEERS, INC.

2200 South Main Street, Suite A
Blacksburg, VA 24060
540-552-0444 Fax: 540-552-0291

Richmond, VA | Raleigh, NC
Charlottesville, VA | Northern Virginia
Newport News, VA | Virginia Beach, VA

DESIGNED	WMD
DRAWN	DLD
CHECKED	MDL
DATE	09/15/2023

FIGURE 1

Summary of Semiannual Target Analyte Monitoring Results Appendix J
Corrective Action Monitoring Plan - Targeted Constituents
Hazardous Waste Management Unit 5
Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 5W8B

Analyte/Quarter	*5W8B Q*	*5W5B Q*	*5W7B Q*	*5WC21 Q*	*5WC22 Q*	*5WC23 Q*	*5W12A Q*	*QL*	*Permit QL*	*GPS*	*DL*	*Permit DL*	*UNIT*	*Method*
Cobalt						*CAS # 7440-48-4*								
Second Quarter 2023	U N	U	4.2 J	25	12	U N	U	5	5	7	1	1	ug/L	6020B
Third Quarter 2023	U	U	6.7	27	26	U	U	5	5	7	1	1	ug/L	6020B
1,1-Dichloroethene						*CAS # 75-35-4*								
Second Quarter 2023	U	U	U	U	U	U	U	1	1	7	0.2	0.2	ug/L	8260D
Third Quarter 2023	U	U	U	U	U	U	U	1	1	7	0.2	0.2	ug/L	8260D
cis-1,2-Dichloroethene						*CAS # 156-59-2*								
Second Quarter 2023	U	U	U	U	U	U	U	1	1	70	0.1	0.1	ug/L	8260D
Third Quarter 2023	U	U	U	U	U	U	U	1	1	70	0.1	0.1	ug/L	8260D
trans-1,2-Dichloroethene						*CAS # 156-60-5*								
Second Quarter 2023	U	U	U	U	U	U	U	1	1	100	0.8	0.8	ug/L	8260D
Third Quarter 2023	U	U	U	U	U	U	U	1	1	100	0.8	0.8	ug/L	8260D
Trichloroethene						*CAS # 79-01-6*								
Second Quarter 2023	U	U	U	0.92 J	1.6	1.8	U	1	1	5	0.3	0.3	ug/L	8260D
Third Quarter 2023	U	U	U	0.85 J	1.6	1.7	U	1	1	5	0.3	0.3	ug/L	8260D
Vinyl chloride						*CAS # 75-01-4*								
Second Quarter 2023	U	U	U	U	U	U	U	1	1	2	0.2	0.2	ug/L	8260D
Third Quarter 2023	U	U	U	U	U	U	U	1	1	2	0.2	0.2	ug/L	8260D

Summary of Semiannual Target Analyte Monitoring Results Appendix J
Corrective Action Monitoring Plan - Targeted Constituents
Hazardous Waste Management Unit 5
Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 5W8B

Analyte/Quarter	*5W8B Q*	*5W5B Q*	*5W7B Q*	*5WC21 Q*	*5WC22 Q*	*5WC23 Q*	*5W12A Q*	*QL*	*Permit QL*	*GPS*	*DL*	*Permit DL*	*UNIT*	*Method*

Definitions:

Results are reported to the permit detection limit.
All metals reported as Total, unless specifically noted as dissolved.

QL Denotes laboratory quantitation limit.
Permit QL Denotes permit quantitation limit. Class 1 Permit Mod approved May 5, 2021

DL Denotes laboratory detection limit.
Permit DL Denotes permit detection limit. Class 1 Permit Mod approved May 5, 2021
U denotes not detected at or above the permit detection limit or QL.
UA denotes not detected at or above the adjusted detection limit or adjusted QL.
J Denotes result is estimated. When used with "U" (i.e., "UJ"), denotes analyte not detected at or above the detection limit or QL and detection limit and QL are estimated. When used with "UA" (i.e., "UAJ"), denotes analyte not detected at or above adjusted detection limit and adjusted detection limit and QL are estimated.
UN Denotes analyte concentration is less than the QL and/or five times the blank concentration. Not reliably detected due to blank contamination.
R Denotes result rejected.
Q Denotes data validation qualifier. **X** Denotes mass spectral confirmation not obtained-result suspect.

CAS# Denotes Chemical Abstract Services registration number.
GPS Denotes Groundwater Protection Standards (2014) listed in Appendix J of Module VI-Groundwater Corrective Action & Monitoring Program for Unit 5 (approved by the VDEQ in the Post-Closure Care Permit for Hazardous Waste Units 5 and 16 (October 4, 2002, reissued August 16, 2014). Dec 2016/May 2021 Class I Permit Mods.
The first Corrective Action Monitoring Event occurred Second Quarter 2010.
"–" denotes not sampled.

Summary of Annual Target Analyte Monitoring Results - Appendix K
Corrective Action Monitoring Plan - Targeted Constituents
Hazardous Waste Management Unit 5
Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 5W8B

Analyte/Quarter	*5W8B Q*	*5W5B Q*	*5W7B Q*	*5WC21 Q*	*5WC22 Q*	*5WC23 Q*	*QL*	*Permit QL*	*GPS*	*DL*	*Permit DL*	*UNIT*	*Method*
Antimony						*CAS #* 7440-36-0							
Second Quarter 2023	-	U	U	U	U	U	2	2	6	0.6	0.6	ug/L	6020B
Arsenic						*CAS #* 7440-38-2							
Second Quarter 2023	-	U	U	U	U	U	10	10	10	2	2	ug/L	6020B
Barium						*CAS #* 7440-39-3							
Second Quarter 2023	-	24	23	20	30	19	10	10	2,000	1.3	1.3	ug/L	6020B
Beryllium						*CAS #* 7440-41-7							
Second Quarter 2023	-	U	U	0.41 J	U	U	1	1	4	0.3	0.3	ug/L	6020B
Cadmium						*CAS #* 7440-43-9							
Second Quarter 2023	-	U	U	0.23 J	U	U	1	1	5	0.2	0.2	ug/L	6020B
Chromium						*CAS #* 7440-47-3							
Second Quarter 2023	-	U	2.4 J	2.1 J	U	U	5	5	100	1	1	ug/L	6020B
Cobalt						*CAS #* 7440-48-4							
Second Quarter 2023	U N	U	4.2 J	25	12	U N	5	5	7	1	1	ug/L	6020B
Third Quarter 2023	U	U	6.7	27	26	U	5	5	7	1	1	ug/L	6020B
Copper						*CAS #* 7440-50-8							
Second Quarter 2023	-	1.8 J	1.9 J	U	U	U	5	5	1,300	1.7	1.7	ug/L	6020B
Lead						*CAS #* 7439-92-1							
Second Quarter 2023	-	U	U	U	U	U	3	3	15	1	1	ug/L	6020B
Mercury						*CAS #* 7439-97-6							
Second Quarter 2023	-	U	U	U	U	U	2	2	2	0.2	0.2	ug/L	7470A
Nickel						*CAS #* 7440-02-0							
Second Quarter 2023	-	U	4 J	15	3.8 J	U	10	10	300	2	2	ug/L	6020B
Selenium						*CAS #* 7782-49-2							
Second Quarter 2023	-	U	U	U	U	U	10	10	50	3	3	ug/L	6020B
Silver						*CAS #* 7440-22-4							
Second Quarter 2023	-	U	U	U	U	U	2	2	71	0.3	0.3	ug/L	6020B
Thallium						*CAS #* 7440-28-0							
Second Quarter 2023	-	U N	U	U	U	U	1	1	2	0.2	0.2	ug/L	6020B
Vanadium						*CAS #* 7440-62-2							
Second Quarter 2023	-	U	U	U	U	U	10	10	63	2.5	2.5	ug/L	6020B

See last page of this report for definitions.

Summary of Annual Target Analyte Monitoring Results - Appendix K
Corrective Action Monitoring Plan - Targeted Constituents
Hazardous Waste Management Unit 5
Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 5W8B

Analyte/Quarter	*5W8B Q*	*5W5B Q*	*5W7B Q*	*5WC21 Q*	*5WC22 Q*	*5WC23 Q*	*QL*	*Permit QL*	*GPS*	*DL*	*Permit DL*	*UNIT*	*Method*
Zinc						*CAS # 7440-66-6*							
Second Quarter 2023	-	10 J	9.5 J	9.1 J	U	U	30	30	4700	7.3	7.3	ug/L	6020B
Acetone						*CAS # 67-64-1*							
Second Quarter 2023	-	U	U	U	U	U	10	10	12000	3	3	ug/L	8260D
bis(2-Ethylhexyl)phthalate						*CAS # 117-81-7*							
Second Quarter 2023	-	U N	U N	U N	U N	U N	6	6	10	1.5	1.5	ug/L	8270E
2-Butanone						*CAS # 78-93-3*							
Second Quarter 2023	-	U	U	U	U	U	10	10	4900	1.7	1.7	ug/L	8260D
Chloroform						*CAS # 67-66-3*							
Second Quarter 2023	-	1.4	U	1.3	1.2	1.2	1	1	80	0.3	0.3	ug/L	8260D
Dichlorodifluoromethane						*CAS # 75-71-8*							
Second Quarter 2023	-	U	U	U	U	U	1	1	190	0.4	0.4	ug/L	8260D
1,2-Dichloroethane						*CAS # 107-06-2*							
Second Quarter 2023	-	U	U	U	U	U	1	1	5	0.3	0.3	ug/L	8260D
Diethyl ether						*CAS # 60-29-7*							
Second Quarter 2023	-	U	U	U J	U J	1.3 J	13	12.5	7,300	1.1	1.11	ug/L	8260D
Diethyl phthalate						*CAS # 84-66-2*							
Second Quarter 2023	-	U	U	U	U	U	10	10	11000	2	2	ug/L	8270E
2,4-Dinitrotoluene						*CAS # 121-14-2*							
Second Quarter 2023	-	U	U	U	U	U	10	10	10	2.1	2.1	ug/L	8270E
2,6-Dinitrotoluene						*CAS # 606-20-2*							
Second Quarter 2023	-	U	U	U	U	U	10	10	10	2.1	2.1	ug/L	8270E
Methylene chloride						*CAS # 75-09-2*							
Second Quarter 2023	-	U	U	U	U	U	1	1	5	0.7	0.7	ug/L	8260D
o-Nitroaniline						*CAS # 88-74-4*							
Second Quarter 2023	-	U	U	1.5 J	2.3 J	2.3 J	10	10	150	1	1	ug/L	8270E
p-Nitroaniline						*CAS # 100-01-6*							
Second Quarter 2023	-	U	U	U	U	U	20	20	20	1.5	1.5	ug/L	8270E
Nitrobenzene						*CAS # 98-95-3*							
Second Quarter 2023	-	U	U	U	0.96 J	0.86 J	10	10	10	0.8	0.8	ug/L	8270E
Toluene						*CAS # 108-88-3*							
Second Quarter 2023	-	U	U	U	U	U	1	1	1,000	0.3	0.3	ug/L	8260D

See last page of this report for definitions.

Summary of Annual Target Analyte Monitoring Results - Appendix K
Corrective Action Monitoring Plan - Targeted Constituents
Hazardous Waste Management Unit 5
Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 5W8B

Analyte/Quarter	*5W8B Q*	*5W5B Q*	*5W7B Q*	*5WC21 Q*	*5WC22 Q*	*5WC23 Q*	*QL*	*Permit QL*	*GPS*	*DL*	*Permit DL*	*UNIT*	*Method*
Xylenes (Total)						*CAS # 1330-20-7*							
Second Quarter 2023	-	U	U	U	U	U	3	3	10,000	0.4	0.4	ug/L	8260D

Definitions:

Results are reported to the Permit Detection Limit. Inorganic results reported as total, unless noted as dissolved.
First Corrective Action Monitoring Event Second Quarter 2010:

QL: Denotes laboratory quantitation limit.
Permit QL: Denotes permit quantitation limit. Approved May 5, 2021
Class 1 Permit Modification approved May 5, 2021
DL: Denotes laboratory detection limit.
Permit DL: Denotes permit detection limit.
Class 1 Permit Modification approved May 5, 2021
U: Denotes not detected at or above the permit detection limit or QL.
UA: Denotes not detected at or above the adjusted detection limit or adjusted QL.
J: Denotes result is estimated. When used with "U" (i.e., "UJ"), denotes analyte not detected at or above the detection limit or QL and detection limit and QL are estimated. When used with "UA" (i.e., "UAJ"), denotes analyte not detected at or above adjusted detection limit and adjusted detection limit and QL are estimated.
UN: Denotes analyte concentration is less than the QL and/or five times the blank concentration. Not reliably detected due to blank contamination.
R: Denotes result rejected.
Q: Denotes data validation qualifier.
X: Denotes mass spectral confirmation not obtained - result suspect.

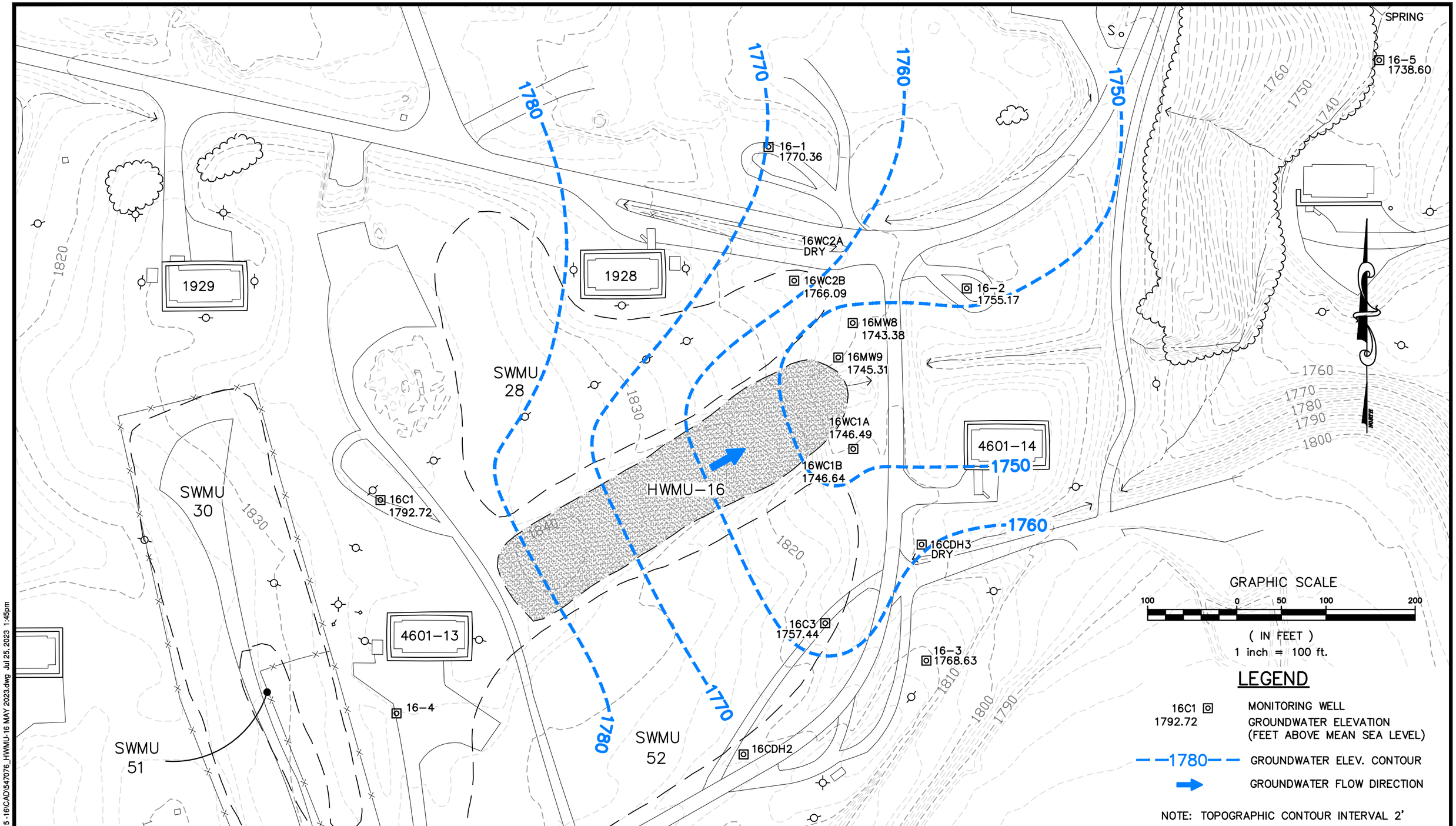
CAS#: Denotes Chemical Abstract Services registration number.
GPS: Denotes Groundwater Protection Standards listed in Appendix K of Module VI-Groundwater Corrective Action & Monitoring Program for Unit 5 (approved by the VDEQ and incorporated into the Final Hazardous Waste Post-Closure Care Permit for Hazardous Waste Units 5 and 16 (original effective date October 4, 2002 and reissued August 16, 2014; Dec 2016 and May 5, 2021 Class I Permit Mods);
"–": Denotes not sampled.

Table 3: Indicator Parameter Data for Monitoring Wells
Radford Army Ammunition Plant (RFAAP) - Hazardous Waste Management Unit #5
Radford, Virginia

Indicator Parameter	*Unit*	*5W8B*	*5W5B*	*5W7B*	*5WC21*	*5WC22*	*5WC23*	*5W12A*
Second Quarter 2023								
DO	mg/L	5.05	1.55	5.66	0.16	0.5	0.81	1.47
ORP	mV	310	273	287	201	203	183	281
pH	s.u.	4.66	5.42	5.1	5.47	6.77	6.9	6.69
Specific Conductivity	uS/cm	58.85	325	160.5	515.3	890.1	937.9	500.2
Temperature	deg C	13.4	12.8	12.8	13.8	14.1	13.8	13.7
Turbidity	NTU	3.55	0.72	1.89	122	8.01	1.34	2
Third Quarter 2023								
DO	mg/L	4.62	1.7	2.82	0.89	1.78	1.61	1.44
ORP	mV	271	226	229	191	179	135	214
pH	s.u.	4.29	5.24	4.89	5.4	6.75	6.81	6.57
Specific Conductivity	uS/cm	58.78	326.9	100.8	487.2	875.5	899.9	496.9
Temperature	deg C	15.7	14.7	15.5	14.8	14.7	15.1	14.6
Turbidity	NTU	3.23	0.76	1.32	95	13.4	0.75	14.48

APPENDIX B

HWMU-16



TRC
TRC ENGINEERS, INC.
2200 South Main Street, Suite A
Blacksburg, VA 24060
540-552-0444 Fax: 540-552-0291
Richmond, VA Raleigh, NC
Charlottesville, VA Northern Virginia
Newport News, VA Virginia Beach, VA

DESIGNED	WMD
DRAWN	DLD
CHECKED	MDL
DATE	07/25/2023

HWMU-16 POTENTIOMETRIC SURFACE MAP - MAY 15-16, 2023

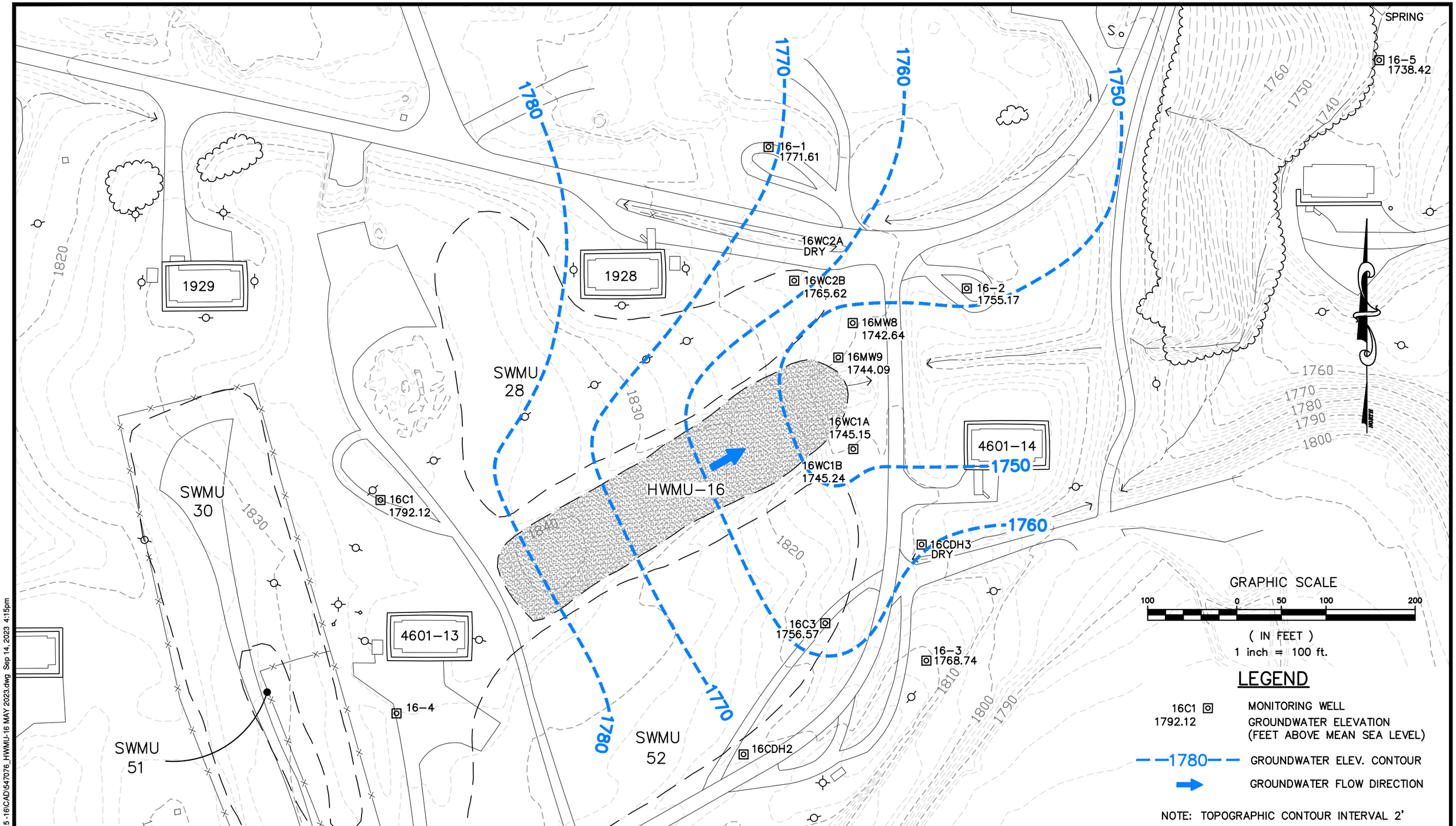
RADFORD ARMY AMMUNITION PLANT

RADFORD, VIRGINIA

SCALE: 1"=100'

PLAN NO. 547076

FIGURE 2



TRC
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Richmond, VA Raleigh, NC
Charlottesville, VA Northern Virginia
Newport News, VA Virginia Beach, VA

DESIGNED	WMD
DRAWN	DLD
CHECKED	MDL
DATE	09/14/2023

HWMU-16 POTENTIOMETRIC SURFACE MAP - JULY 26, 2023

RADFORD ARMY AMMUNITION PLANT

RADFORD, VIRGINIA

SCALE: 1"=100'

PLAN NO. 547076

FIGURE 2

Target Analyte Monitoring Results - HWMU-16 Point of Compliance Wells
Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 16C1 ***All Results in ug/L.***

Analtye/Quarter	*16C1*	*16MW8*	*16MW9*	*16WC1A*	*16WC1B*	*QL*	*Permit QL*	*DL*	*Permit DL*	*GPS*	*Method*
Antimony					*CAS #*	*7440-36-0*					
Third Quarter 2023	U	U	U	U	U	2	2	0.6	0.6	-	6020B
Arsenic					*CAS #*	*7440-38-2*					
Second Quarter 2023	U	U	U	U	U	10	10	2	2	10	6020B
Third Quarter 2023	U	U	2.6 J	5.3 J	U	10	10	2	2	10	6020B
Barium					*CAS #*	*7440-39-3*					
Second Quarter 2023	210	120	640	500	90	10	10	1.3	1.3	2000	6020B
Third Quarter 2023	200	150	660	510	89	10	10	1.3	1.3	2000	6020B
Beryllium					*CAS #*	*7440-41-7*					
Second Quarter 2023	U	U	U	U	U	1	1	0.3	0.3	4	6020B
Third Quarter 2023	U	0.31 J	U	U	U	1	1	0.3	0.3	4	6020B
Cadmium					*CAS #*	*7440-43-9*					
Second Quarter 2023	U	U	U	U	U	1	1	0.2	0.2	5	6020B
Third Quarter 2023	U	0.27 J	0.37 J	U	0.71 J	1	1	0.2	0.2	5	6020B
Chromium					*CAS #*	*7440-47-3*					
Second Quarter 2023	U	U	U	U	U	5	5	1	1	100	6020B
Third Quarter 2023	U	U	U	U	3.3 J	5	5	1	1	100	6020B
Cobalt					*CAS #*	*7440-48-4*					
Second Quarter 2023	U	U	6	18	U	5	5	1	1	5	6020B
Third Quarter 2023	U	U	5.7	15	3.5 J	5	5	1	1	5	6020B
Copper					*CAS #*	*7440-50-8*					
Second Quarter 2023	U	U	U	U	U	5	5	1.7	1.7	1300	6020B
Third Quarter 2023	U	11	U	U	2.9 J	5	5	1.7	1.7	1300	6020B
Lead					*CAS #*	*7439-92-1*					
Second Quarter 2023	U	U	U	U	U	3	3	1	1	15	6020B
Third Quarter 2023	U	U	U	U	U	3	3	1	1	15	6020B
Mercury					*CAS #*	*7439-97-6*					
Second Quarter 2023	U	U	U	U	U	2	2	0.2	0.2	2	7470A
Third Quarter 2023	U	U	U	U	0.25 J	2	2	0.2	0.2	2	7470A
Nickel					*CAS #*	*7440-02-0*					
Second Quarter 2023	U	U	14	16	U	10	10	2	2	300	6020B
Third Quarter 2023	4 J	2.9 J	17	15	4.7 J	10	10	2	2	300	6020B
Selenium					*CAS #*	*7782-49-2*					
Third Quarter 2023	U	U	U	U	U	10	10	3	3	-	6020B
Silver					*CAS #*	*7440-22-4*					
Third Quarter 2023	U	U	U	U	0.59 J	2	2	0.3	0.3	-	6020B
Third Quarter 2023 **verification event**					0.34 J	2	2	0.3	0.3	-	6020B
Thallium					*CAS #*	*7440-28-0*					
Third Quarter 2023	U	U	U	U	U	1	1	0.2	0.2	-	6020B
Vanadium					*CAS #*	*7440-62-2*					
Second Quarter 2023	U	U	U	U	U	10	10	2.5	2.5	151	6020B
Third Quarter 2023	U	U	U	U	U	10	10	2.5	2.5	151	6020B
Zinc					*CAS #*	*7440-66-6*					
Second Quarter 2023	U	U	U	U	U	30	30	7.3	7.3	4700	6020B
Third Quarter 2023	U	25 J	U	11 J	11 J	30	30	7.3	7.3	4700	6020B
Cyanide					*CAS #*	*57-12-5*					
Third Quarter 2023 **verification event**	-		U			20	20	5	5	-	9012B
Third Quarter 2023	7.5 J	U	6.7 J	U	U	20	20	5	5	-	9012B
Acenaphthene					*CAS #*	*83-32-9*					
Third Quarter 2023	U	U	U	U	U	10	10	0.35	0.35	-	8270D
Acenaphthylene					*CAS #*	*208-96-8*					
Third Quarter 2023	U	U	U	U	U	10	10	0.48	0.48	-	8270D
Acetone					*CAS #*	*67-64-1*					
Third Quarter 2023	U	U	U	U	U	10	10	2	2	-	8260D

See last page of this report for definitions.

Target Analyte Monitoring Results - HWMU-16 Point of Compliance Wells
Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 16C1 ***All Results in ug/L.***

Analtye/Quarter	*16C1*	*16MW8*	*16MW9*	*16WC1A*	*16WC1B*	*QL*	*Permit QL*	*DL*	*Permit DL*	*GPS*	*Method*
Acetonitrile					*CAS #*	*75-05-8*					
Third Quarter 2023	U	U	U	U	U	100	100	31	31.67	-	8260D
Acetophenone					*CAS #*	*98-86-2*					
Third Quarter 2023	U	U	U	U	U	9.3	10	0.93	1	-	8270E
2-Acetylaminofluorene					*CAS #*	*53-96-3*					
Third Quarter 2023	U	U	U	U	U	9.3	10	2.8	3	-	8270E
Acrolein					*CAS #*	*107-02-8*					
Third Quarter 2023	U	U	U	U	U	10	10	2.1	3.4	-	8260D
Acrylonitrile					*CAS #*	*107-13-1*					
Third Quarter 2023	U	U	U	U	U	10	10	1.1	1.1	-	8260D
Allyl chloride					*CAS #*	*107-05-1*					
Third Quarter 2023	U	U	U	U	U	10	10	1	1	-	8260D
4-Aminobiphenyl					*CAS #*	*92-67-1*					
Third Quarter 2023	U	U	U	U	U	9.3	10	2.8	3	-	8270E
Aniline					*CAS #*	*62-53-3*					
Third Quarter 2023	U	U	U	U	U	9.3	10	1	1.1	-	8270E
Anthracene					*CAS #*	*120-12-7*					
Third Quarter 2023	U	U	U	U	U	10	10	0.52	0.52	-	8270D
Aramite					*CAS #*	*140-57-8*					
Third Quarter 2023	U	U	U	U	U	9.3	10	3.4	3.7	-	8270E
Benzene					*CAS #*	*71-43-2*					
Second Quarter 2023	U	U	U	U	U	1	1	0.3	0.3	5	8260D
Third Quarter 2023	0.33 J	U	0.39 J	0.37 J	U	1	1	0.3	0.3	5	8260D
Benzo[a]anthracene					*CAS #*	*56-55-3*					
Third Quarter 2023	U	U	U	U	U	10	10	0.45	0.45	-	8270D
Benzo[b]fluoranthene					*CAS #*	*205-99-2*					
Third Quarter 2023	U	U	U	U	U	10	10	1.2	1.2	-	8270D
Benzo[k]fluoranthene					*CAS #*	*207-08-9*					
Third Quarter 2023	U	U	U	U	U	10	10	1.6	1.6	-	8270D
Benzo[ghi]perylene					*CAS #*	*191-24-2*					
Third Quarter 2023	U	U	U	U	U	10	10	0.42	0.42	-	8270D
Benzo(a)pyrene					*CAS #*	*50-32-8*					
Third Quarter 2023	U	U	U	U	U	10	10	1.5	1.5	-	8270D
1,4-Benzenediamine					*CAS #*	*106-50-3*					
Third Quarter 2023	U J	U J	U J	U J	U J	140	150	24	26.4	-	8270E
Benzyl alcohol					*CAS #*	*100-51-6*					
Third Quarter 2023	U J	U J	U J	U J	U J	9.3	10	2.8	3	-	8270E
bis(2-Chloroethoxy)methane					*CAS #*	*111-91-1*					
Third Quarter 2023	U	U	U	U	U	0.93	1	0.46	0.5	-	8270E
bis(2-Chloroethyl)ether					*CAS #*	*111-44-4*					
Third Quarter 2023	U	U	U	U	U	0.93	1	0.46	0.5	-	8270E
bis(2-Chloro-1-methylethyl)ether					*CAS #*	*108-60-1*					
Third Quarter 2023	**UJ**	U	U J	U J	U	10	10	0.6	0.6	-	8270D
bis(2-Ethylhexyl)phthalate					*CAS #*	*117-81-7*					
Third Quarter 2023	U	U	U	U	U	10	10	2	2	-	8270D
Bromodichloromethane					*CAS #*	*75-27-4*					
Third Quarter 2023	U	U	U	U	U	1	1	0.3	0.3	-	8260D
Bromoform					*CAS #*	*75-25-2*					
Third Quarter 2023	U	U	U	U	U	1	1	0.4	0.4	-	8260D
4-Bromophenyl phenyl ether					*CAS #*	*101-55-3*					
Third Quarter 2023	U	U	U	U	U	10	10	0.56	0.56	-	8270D
2-Butanone					*CAS #*	*78-93-3*					
Second Quarter 2023	U	U	U	U	U	10	10	1.7	1.7	4900	8260D
Third Quarter 2023	U	U	U	U	U	10	10	1.7	1.7	4900	8260D

Target Analyte Monitoring Results - HWMU-16 Point of Compliance Wells
Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 16C1 ***All Results in ug/L.***

Analtye/Quarter	*16C1*	*16MW8*	*16MW9*	*16WC1A*	*16WC1B*	*QL*	*Permit QL*	*DL*	*Permit DL*	*GPS*	*Method*
Butyl benzyl phthalate					*CAS #*	*85-68-7*					
Third Quarter 2023	U	U	U	U	U	9.3	10	0.65	0.7	-	8270E
Carbon disulfide					*CAS #*	*75-15-0*					
Third Quarter 2023	U	U	U	U	U	10	10	0.4	0.4	-	8260D
Carbon tetrachloride					*CAS #*	*56-23-5*					
Second Quarter 2023	U	U	U	U	U	1	1	0.3	0.3	5	8260D
Third Quarter 2023	U	U	U	U	U	1	1	0.3	0.3	5	8260D
p-Chloroaniline					*CAS #*	*106-47-8*					
Third Quarter 2023	U	U	U	U	U	9.3	10	3.1	3.3	-	8270E
Chlorobenzilate					*CAS #*	*510-15-6*					
Third Quarter 2023	U	U	U	U	U	9.3	10	2.8	3	-	8270E
p-Chloro-m-cresol					*CAS #*	*59-50-7*					
Third Quarter 2023	U	U	U	U	U	10	10	1	1	-	8270D
Chloroethane					*CAS #*	*75-00-3*					
Second Quarter 2023	1.1	U	1.6	1.6	U	1	1	0.07		21000	8260D
Third Quarter 2023	3.4	0.083 J	1.9	2.2	U	1	1	0.07		21000	8260D
Chloroform					*CAS #*	*67-66-3*					
Third Quarter 2023	U	U	U	U	U	1	1	0.3	0.3	-	8260D
2-Chloronaphthalene					*CAS #*	*91-58-7*					
Third Quarter 2023	U	U	U	U	U	10	10	0.5	0.5	-	8270D
2-Chlorophenol					*CAS #*	*95-57-8*					
Third Quarter 2023	U J	U J	U J	U J	U J	10	10	1	1	-	8270D
4-Chlorophenyl phenyl ether					*CAS #*	*7005-72-3*					
Third Quarter 2023	U	U	U	U	U	10	10	0.6	0.6	-	8270D
Chloroprene					*CAS #*	*126-99-8*					
Third Quarter 2023	U	U	U	U	U	10	10	0.46	0.46	-	8260D
Chrysene					*CAS #*	*218-01-9*					
Third Quarter 2023	U	U	U	U	U	10	10	0.31	0.31	-	8270D
Diallate					*CAS #*	*2303-16-4*					
Third Quarter 2023	U	U	U	U	U	10	10	3	3	-	8270D
Dibenz(a,h)anthracene					*CAS #*	*53-70-3*					
Third Quarter 2023	U	U	U	U	U	10	10	0.38	0.38	-	8270D
Dibenzofuran					*CAS #*	*132-64-9*					
Third Quarter 2023	U	U	U	U	U	10	10	0.6	0.6	-	8270D
Dibromochloromethane					*CAS #*	*124-48-1*					
Third Quarter 2023	U	U	U	U	U	1	1	0.4	0.4	-	8260D
1,2-Dibromo-3-chloropropane					*CAS #*	*96-12-8*					
Third Quarter 2023	U	U	U	U	U	1	1	0.4	0.4	-	8260D
1,2-Dibromoethane					*CAS #*	*106-93-4*					
Third Quarter 2023	U	U	U	U	U	1	1	0.3	0.3	-	8260D
Di-n-butyl phthalate					*CAS #*	*84-74-2*					
Third Quarter 2023	U	U	U	U	U	9.3	10	1.7	1.8	-	8270E
1,2-Dichlorobenzene					*CAS #*	*95-50-1*					
Third Quarter 2023	U	U	U	U	U	1	1	0.4	0.4	-	8260D
1,3-Dichlorobenzene					*CAS #*	*541-73-1*					
Third Quarter 2023	U	U	U	U	U	1	1	0.4	0.4	-	8260D
1,4-Dichlorobenzene					*CAS #*	*106-46-7*					
Third Quarter 2023	U	U	U	U	U	1	1	0.4	0.4	-	8260D
3,3'-Dichlorobenzidine					*CAS #*	*91-94-1*					
Third Quarter 2023	U	U	U	U	U	9.3	10	2.8	3	-	8270E
trans-1,4-Dichloro-2-butene					*CAS #*	*110-57-6*					
Third Quarter 2023	U J	U J	U J	U J	U J	10	10	1.3	1.5	-	8260D
Dichlorodifluoromethane					*CAS #*	*75-71-8*					
Second Quarter 2023	U	U	U	U	U	1	1	0.4	0.4	190	8260D
Third Quarter 2023	U	U	U	U	U	1	1	0.4	0.4	190	8260D

See last page of this report for definitions.

Target Analyte Monitoring Results - HWMU-16 Point of Compliance Wells
Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 16C1 ***All Results in ug/L.***

Analtye/Quarter	*16C1*	*16MW8*	*16MW9*	*16WC1A*	*16WC1B*	*QL*	*Permit QL*	*DL*	*Permit DL*	*GPS*	*Method*
1,1-Dichloroethane					*CAS #*	*75-34-3*					
Second Quarter 2023	4.8	U	4.7	3.2	U	1	1	0.3	0.3	9.5	8260D
Third Quarter 2023	5.2	U	5.1	4.2	U	1	1	0.3	0.3	9.5	8260D
1,2-Dichloroethane					*CAS #*	*107-06-2*					
Third Quarter 2023	U	U	U	U	U	1	1	0.3	0.3	-	8260D
1,1-Dichloroethene					*CAS #*	*75-35-4*					
Second Quarter 2023	U	U	U	U	U	1	1	0.3	0.3	7	8260D
Third Quarter 2023	U	U	U	U	U	1	1	0.3	0.3	7	8260D
trans-1,2-Dichloroethene					*CAS #*	*156-60-5*					
Third Quarter 2023	U	U	U	U	U	1	1	0.3	0.3	-	8260D
2,4-Dichlorophenol					*CAS #*	*120-83-2*					
Third Quarter 2023	U J	U J	U J	U J	U J	10	10	1.5	1.59	-	8270D
2,6-Dichlorophenol					*CAS #*	*87-65-0*					
Third Quarter 2023	U J	U J	U J	U J	U J	10	10	1.4	1.4	-	8270D
1,2-Dichloropropane					*CAS #*	*78-87-5*					
Third Quarter 2023	U	U	U	U	U	1	1	0.4	0.4	-	8260D
1,3-Dichloropropane					*CAS #*	*142-28-9*					
Third Quarter 2023	U	U	U	U	U	1	1	0.4	0.4	-	8260D
trans-1,3-Dichloropropene					*CAS #*	*10061-02-6*					
Third Quarter 2023	U	U	U	U	U	1	1	0.4	0.4	-	8260D
Diethyl ether					*CAS #*	*60-29-7*					
Second Quarter 2023	11	U	61	18	U	10	12.5	1.1	1.11	7300	8260D
Third Quarter 2023	33 J	9.6 J	62	22	U	10	12.5	1.1	1.11	7300	8260D
Diethyl phthalate					*CAS #*	*84-66-2*					
Second Quarter 2023	U	U	U	U	U	5	5	0.5	2	11000	8270E
Third Quarter 2023	U	U	U	U	U	5	5	2	2	11000	8270D
O,O-Diethyl O-2-pyrazinyl					*CAS #*	*297-97-2*					
Third Quarter 2023	U	U	U	U	U	10	10	2.4	2.4	-	8270D
Dimethoate					*CAS #*	*60-51-5*					
Third Quarter 2023	U	U	U	U	U	10	10	3	3	-	8270D
Dimethyl ether					*CAS #*	*115-10-6*					
Second Quarter 2023	U	U	U	U	U	10	12.5	1.1	1.11	17	8260C
Third Quarter 2023	7.7 J	U	U	U	U	10	12.5	1.1	1.11	17	8260C
p-(Dimethylamino)azobenzene					*CAS #*	*60-11-7*					
Third Quarter 2023	U	U	U	U	U	9.3	10	2.8	3	-	8270E
7,12-Dimethylbenz[a]anthracene					*CAS #*	*57-97-6*					
Third Quarter 2023	U	U	U	U	U	9.3	10	1.7	1.8	-	8270E
3,3'-Dimethylbenzidine					*CAS #*	*119-93-7*					
Third Quarter 2023	U	U	U	U	U	9.3	10	3.1	3.3	-	8270E
a,a-Dimethylphenethylamine					*CAS #*	*122-09-8*					
Third Quarter 2023	U J	U J	U J	U J	U J	50	50	5	5	-	8270D
2,4-Dimethylphenol					*CAS #*	*105-67-9*					
Third Quarter 2023	U	U	U	U	U	9.3	10	2.8	3	-	8270E
Dimethyl phthalate					*CAS #*	*131-11-3*					
Third Quarter 2023	-	-	-	U J	-	0.952	10	0.286	0.5	-	8270E
Third Quarter 2023	U J	-	-	-	-	0.945	10	0.284	0.5	-	8270E
Third Quarter 2023	-	-	-	-	U J	0.94	10	0.291	0.5	-	8270E
Third Quarter 2023	-	-	U J	-	-	0.945	10	0.283	0.5	-	8270E
Third Quarter 2023	-	U J	-	-	-	0.94	10	0.282	0.5	-	8270E
m-Dinitrobenzene					*CAS #*	*99-65-0*					
Third Quarter 2023	U	U	U	U	U	10	10	2.3	2.3	-	8270D
4,6-Dinitro-o-cresol					*CAS #*	*534-52-1*					
Third Quarter 2023	U	U	U	U	U	9.3	10	2.8	3	-	8270E
2,4-Dinitrophenol					*CAS #*	*51-28-5*					
Third Quarter 2023	U	U	U	U	U	9.3	10	5.7	6.2	-	8270E

See last page of this report for definitions.

Target Analyte Monitoring Results - HWMU-16 Point of Compliance Wells
Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 16C1 ***All Results in ug/L.***

Analtye/Quarter	*16C1*	*16MW8*	*16MW9*	*16WC1A*	*16WC1B*	*QL*	*Permit QL*	*DL*	*Permit DL*	*GPS*	*Method*
2,4-Dinitrotoluene					*CAS #*	*121-14-2*					
Second Quarter 2023	U	U	U	U	U	10	10	0.5	2.1	10	8270E
Third Quarter 2023	U	U	U	U	U	10	10	2.1	2.1	10	8270D
2,6-Dinitrotoluene					*CAS #*	*606-20-2*					
Second Quarter 2023	U	U	U	U	U	10	10	0.5	2.1	10	8270E
Third Quarter 2023	U	U	U	U	U	10	10	2.1	2.1	10	8270D
Di-n-octyl phthalate					*CAS #*	*117-84-0*					
Third Quarter 2023	-	U	-	-	-	0.94	10	0.282	0.8	-	8270E
Third Quarter 2023	-	-	-	-	U	0.94	10	0.291	0.8	-	8270E
Third Quarter 2023	-	-	U	-	-	0.945	10	0.283	0.8	-	8270E
Third Quarter 2023	-	-	-	U	-	0.952	10	0.286	0.8	-	8270E
Third Quarter 2023	U	-	-	-	-	0.945	10	0.284	0.8	-	8270E
1,4-Dioxane					*CAS #*	*123-91-1*					
Third Quarter 2023	U	U	U	U	U	200	200	45	45.48	-	8260D
Diphenylamine					*CAS #*						
Third Quarter 2023	U	U	U	U	U	10	10	0.58	0.58	-	8270D
Disulfoton					*CAS #*	*298-04-4*					
Third Quarter 2023	U	U	U	U	U	9.3	10	2.8	3	-	8270E
Ethylbenzene					*CAS #*	*100-41-4*					
Second Quarter 2023	U	U	U	U	U	1	1	0.3	0.3	700	8260D
Third Quarter 2023	U	U	U	U	U	1	1	0.3	0.3	700	8260D
Ethyl methacrylate					*CAS #*	*97-63-2*					
Third Quarter 2023	U	U	U	U	U	10	10	0.81	0.81	-	8260D
Ethyl methanesulfonate					*CAS #*	*62-50-0*					
Third Quarter 2023	U	U	U	U	U	10	10	1.1	1.1	-	8270D
Famphur					*CAS #*	*52-85-7*					
Third Quarter 2023	U J	U J	U J	U J	U J	9.3	10	4.6	5	-	8270E
Fluoranthene					*CAS #*	*206-44-0*					
Third Quarter 2023	U	U	U	U	U	10	10	0.42	0.42	-	8270D
Fluorene					*CAS #*	*86-73-7*					
Third Quarter 2023	U	U	U	U	U	10	10	0.38	0.38	-	8270D
Hexachlorobenzene					*CAS #*	*118-74-1*					
Third Quarter 2023	U	U	U	U	U	10	10	0.7	0.87	-	8270D
Hexachlorobutadiene					*CAS #*	*87-68-3*					
Third Quarter 2023	U	U	U	U	U	1	1	0.4	0.4	-	8260D
Hexachlorocyclopentadiene					*CAS #*	*77-47-4*					
Third Quarter 2023	U	U	U	U	U	9.3	10	2.8	3	-	8270E
Hexachloroethane					*CAS #*	*67-72-1*					
Third Quarter 2023	U	U	U	U	U	9.3	10	0.37	0.4	-	8270E
Hexachlorophene					*CAS #*	*70-30-4*					
Third Quarter 2023	-	U J	-	-	-	470	500	157	185	-	8270E
Third Quarter 2023	-	-	-	-	U J	486	500	162	185	-	8270E
Third Quarter 2023	-	-	-	U J	-	476	500	159	185	-	8270E
Third Quarter 2023	-	-	U J	-	-	472	500	158	185	-	8270E
Third Quarter 2023	U J	-	-	-	-	473	500	158	185	-	8270E
Hexachloropropene					*CAS #*	*1888-71-7*					
Third Quarter 2023	U	U	U	U	U	10	10	2	2	-	8270D
2-Hexanone					*CAS #*	*591-78-6*					
Third Quarter 2023	U	U	U	U	U	10	10	2	2	-	8260D
Indeno[1,2,3-cd]pyrene					*CAS #*	*193-39-5*					
Third Quarter 2023	U	U	U	U	U	10	10	0.15	0.15	-	8270D
Isobutyl alcohol					*CAS #*	*78-83-1*					
Third Quarter 2023	U	U	U	U	U	200	200	11	11.6	-	8260D
Isodrin					*CAS #*	*465-73-6*					
Third Quarter 2023	U	U	U	U	U	10	10	1.1	1.1	-	8270D

Target Analyte Monitoring Results - HWMU-16 Point of Compliance Wells
Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 16C1 ***All Results in ug/L.***

Analyte/Quarter	*16C1*	*16MW8*	*16MW9*	*16WC1A*	*16WC1B*	*QL*	*Permit QL*	*DL*	*Permit DL*	*GPS*	*Method*
Isophorone					*CAS #*	*78-59-1*					
Third Quarter 2023	U	U	U	U	U	9.3	10	0.46	0.5	-	8270E
Isosafrole					*CAS #*	*120-58-1*					
Third Quarter 2023	U	U	U	U	U	10	10	0.5	1.6	-	8270E
Kepone					*CAS #*	*143-50-0*					
Third Quarter 2023	U J	U	U J	U J	U	50	50	25	25	-	8270D
Methacrylonitrile					*CAS #*	*126-98-7*					
Third Quarter 2023	U	U	U	U	U	100	100	9.7	9.75	-	8260D
Methapyrilene					*CAS #*	*91-80-5*					
Third Quarter 2023	U	U	U	U	U	9.3	10	2.8	3	-	8270E
Bromomethane					*CAS #*	*74-83-9*					
Third Quarter 2023	U	U	U	U	U	1	1	0.54	0.542	-	8260D
Chloromethane					*CAS #*	*74-87-3*					
Second Quarter 2023	U	U	U	U	U	1	1	0.1		190	8260D
Third Quarter 2023	U	U	U	U	U	1	1	0.1		190	8260D
3-Methylcholanthrene					*CAS #*	*56-49-5*					
Third Quarter 2023	U	U	U	U	U	9.3	10	0.93	1	-	8270E
Iodomethane					*CAS #*	*74-88-4*					
Third Quarter 2023	U	U	U	U	U	10	10	0.58	0.58	-	8260D
Methyl methacrylate					*CAS #*	*80-62-6*					
Third Quarter 2023	U	U	U	U	U	10	10	3.5	3.58	-	8260D
Methyl methane sulfonate					*CAS #*	*66-27-3*					
Third Quarter 2023	U	U	U	U	U	9.3	10	0.93	1	-	8270E
2-Methylnaphthalene					*CAS #*	*91-57-6*					
Third Quarter 2023	U	U	U	U	U	10	10	0.29	0.29	-	8270D
Methyl parathion					*CAS #*	*298-00-0*					
Third Quarter 2023	U	U	U	U	U	9.3	10	3	3.2	-	8270E
4-Methyl-2-pentanone					*CAS #*	*108-10-1*					
Third Quarter 2023	U	U	U	U	U	10	10	2	2	-	8260D
2-Methylphenol					*CAS #*	*95-48-7*					
Third Quarter 2023	U	U	U	U	U	10	10	0.8	0.96	-	8270D
3 & 4-Methylphenol					*CAS #*						
Third Quarter 2023	U	U	U	U	U	20	20	2.4	2.47	-	8270D
Dibromomethane					*CAS #*	*74-95-3*					
Third Quarter 2023	U	U	U	U	U	1	1	0.3	0.3	-	8260D
Methylene chloride					*CAS #*	*75-09-2*					
Second Quarter 2023	U	U	U	U	U	1	1	0.7	0.7	13.95	8260D
Third Quarter 2023	U	U	U	U	U	1	1	0.7	0.7	13.95	8260D
Naphthalene					*CAS #*	*91-20-3*					
Third Quarter 2023	U	U	U	U	U	1	1	0.4	0.4	-	8260D
1,4-Naphthoquinone					*CAS #*	*130-15-4*					
Third Quarter 2023	U	U	U	U	U	9.3	10	2.8	3	-	8270E
1-Naphthylamine					*CAS #*	*134-32-7*					
Third Quarter 2023	U	U	U	U	U	9.3	10	2.8	3	-	8270E
2-Naphthylamine					*CAS #*	*91-59-8*					
Third Quarter 2023	U	U	U	U	U	9.3	10	6.5	7	-	8270E
o-Nitroaniline					*CAS #*	*88-74-4*					
Third Quarter 2023	U	U	U	U	U	10	10	1	1	-	8270D
m-Nitroaniline					*CAS #*	*99-09-2*					
Third Quarter 2023	U	U	U	U	U	9.3	10	1.9	2	-	8270E
p-Nitroaniline					*CAS #*	*100-01-6*					
Third Quarter 2023	U	U	U	U	U	10	10	1.5	1.5	-	8270D
Nitrobenzene					*CAS #*	*98-95-3*					
Third Quarter 2023	U	U	U	U	U	10	10	0.6	0.6	-	8270D
o-Nitrophenol					*CAS #*	*88-75-5*					
Third Quarter 2023	U	U	U	U	U	10	10	1.2	1.27	-	8270D

See last page of this report for definitions.

Target Analyte Monitoring Results - HWMU-16 Point of Compliance Wells
Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 16C1 ***All Results in ug/L.***

Analtye/Quarter	*16C1*	*16MW8*	*16MW9*	*16WC1A*	*16WC1B*	*QL*	*Permit QL*	*DL*	*Permit DL*	*GPS*	*Method*
p-Nitrophenol					*CAS #*	*100-02-7*					
Third Quarter 2023	U	U	U	U	U	9.3	10	2.8	3	-	8270E
4-Nitroquinoline-1-oxide					*CAS #*	*56-57-5*					
Third Quarter 2023	U	U	U	U	U	46	50	4.6	5	-	8270E
N-Nitrosodi-n-butylamine					*CAS #*	*924-16-3*					
Third Quarter 2023	U	U	U	U	U	9.3	10	2.8	3	-	8270E
N-Nitrosodiethylamine					*CAS #*	*55-18-5*					
Third Quarter 2023	U	U	U	U	U	10	10	3	3	-	8270D
N-Nitrosodimethylamine					*CAS #*	*62-75-9*					
Third Quarter 2023	U J	U	U J	U J	U	10	10	2	2	-	8270D
N-Nitrosodiphenylamine					*CAS #*	*86-30-6*					
Third Quarter 2023	U	U	U	U	U	10	10	0.58	0.58	-	8270D
N-Nitrosodipropylamine					*CAS #*	*621-64-7*					
Third Quarter 2023	U	U	U	U	U	9.3	10	0.46	0.5	-	8270E
N-Nitrosomethylethylamine					*CAS #*	*10595-95-6*					
Third Quarter 2023	U	U	U	U	U	9.3	10	0.93	1	-	8270E
N-Nitrosomorpholine					*CAS #*	*59-89-2*					
Third Quarter 2023	U	U	U	U	U	10	10	3	3	-	8270D
N-Nitrosopiperidine					*CAS #*	*100-75-4*					
Third Quarter 2023	U	U	U	U	U	10	10	1.1	1.1	-	8270D
N-Nitrosopyrrolidine					*CAS #*	*930-55-2*					
Third Quarter 2023	U	U	U	U	U	9.3	10	0.46	0.5	-	8270E
5-Nitroso-o-toluidine					*CAS #*	*99-55-8*					
Third Quarter 2023	U	U	U	U	U	10	10	2	2	-	8270D
Parathion					*CAS #*	*56-38-2*					
Third Quarter 2023	U	U	U	U	U	9.3	10	2.8	3	-	8270E
Pentachlorobenzene					*CAS #*	*608-93-5*					
Third Quarter 2023	U	U	U	U	U	10	10	1.6	1.6	-	8270D
Pentachloroethane					*CAS #*	*76-01-7*					
Third Quarter 2023	U	U	U	U	U	10	10	1.7	1.7	-	8260D
Pentachloronitrobenzene					*CAS #*	*82-68-8*					
Third Quarter 2023	U	U	U	U	U	10	10	1	1	-	8270E
Pentachlorophenol					*CAS #*	*87-86-5*					
Third Quarter 2023	U	U	U	U	U	10	10	3	3	-	8270D
Phenacetin					*CAS #*	*62-44-2*					
Third Quarter 2023	U	U	U	U	U	10	10	1.4	1.4	-	8270D
Phenanthrene					*CAS #*	*85-01-8*					
Third Quarter 2023	U	U	U	U	U	10	10	0.52	0.52	-	8270D
Phenol					*CAS #*	*108-95-2*					
Third Quarter 2023	U	U	U	U	U	10	10	0.6	0.77	-	8270D
Phorate					*CAS #*	*298-02-2*					
Third Quarter 2023	U	U	U	U	U	10	10	2.5	2.5	-	8270D
2-Picoline					*CAS #*	*931-19-1*					
Third Quarter 2023	U	U	U	U	U	9.3	10	0.93	1	-	8270E
Pronamide					*CAS #*	*23950-58-5*					
Third Quarter 2023	U	U	U	U	U	10	10	1.5	1.5	-	8270E
2-Propanol					*CAS #*	*67-63-0*					
Third Quarter 2023	U	U	U	U	U	100	100	50	50	-	8260D
Propionitrile					*CAS #*	*107-12-0*					
Third Quarter 2023	U	U	U	U	U	100	100	10	10.22	-	8260D
Pyrene					*CAS #*	*129-00-0*					
Third Quarter 2023	U	U	U	U	U	10	10	0.41	0.41	-	8270D
Pyridine					*CAS #*	*110-86-1*					
Third Quarter 2023	U	U	U	U	U	9.3	10	1.9	2	-	8270E
Safrole					*CAS #*	*94-59-7*					
Third Quarter 2023	U	U	U	U	U	10	10	2.2	2.2	-	8270D

Target Analyte Monitoring Results - HWMU-16 Point of Compliance Wells
Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 16C1 ***All Results in ug/L.***

Analtye/Quarter	16C1	16MW8	16MW9	16WC1A	16WC1B	QL	Permit QL	DL	Permit DL	GPS	Method
Styrene					CAS #	100-42-5					
Third Quarter 2023	U	U	U	U	U	1	1	0.3	0.3	-	8260D
Sulfotep					CAS #	3689-24-5					
Third Quarter 2023	U	U	U	U	U	10	10	2.4	2.4	-	8270D
1,2,4,5-Tetrachlorobenzene					CAS #	95-94-3					
Third Quarter 2023	U	U	U	U	U	10	10	2	2	-	8270D
1,1,1,2-Tetrachloroethane					CAS #	630-20-6					
Third Quarter 2023	U	U	U	U	U	1	1	0.3	0.3	-	8260D
1,1,2,2-Tetrachloroethane					CAS #	79-34-5					
Third Quarter 2023	U	U	U	U	U	1	1	0.3	0.3	-	8260D
Tetrachloroethene					CAS #	127-18-4					
Second Quarter 2023	U	U	U	U	U	1	1	0.3	0.3	5	8260D
Third Quarter 2023	U	U	U	U	U	1	1	0.3	0.3	5	8260D
Tetrahydrofuran					CAS #	109-99-9					
Second Quarter 2023	U	U	U	U	U	25	25	2	2	3400	8260D
Third Quarter 2023	16 J	U	U	U	U	25	25	2	2	3400	8260D
2,3,4,6-Tetrachlorophenol					CAS #	58-90-2					
Third Quarter 2023	U	U	U	U	U	10	10	1.8	1.8	-	8270D
Toluene					CAS #	108-88-3					
Second Quarter 2023	U	U	U	U	U	1	1	0.3	0.3	1000	8260D
Third Quarter 2023	U	U	U	U	U	1	1	0.3	0.3	1000	8260D
o-Toluidine					CAS #	95-53-4					
Third Quarter 2023	U	U	U	U	U	9.3	10	3.7	4	-	8270E
1,2,4-Trichlorobenzene					CAS #	120-82-1					
Third Quarter 2023	U	U	U	U	U	1	1	0.6	0.6	-	8260D
1,1,1-Trichloroethane					CAS #	71-55-6					
Second Quarter 2023	U	U	U	U	U	1	1	0.3	0.3	200	8260D
Third Quarter 2023	U	U	U	U	U	1	1	0.3	0.3	200	8260D
1,1,2-Trichloroethane					CAS #	79-00-5					
Third Quarter 2023	U	U	U	U	U	1	1	0.3	0.3	-	8260D
Trichloroethene					CAS #	79-01-6					
Second Quarter 2023	U	U	U	U	U	1	1	0.3	0.3	5	8260D
Third Quarter 2023	U	U	U	U	U	1	1	0.3	0.3	5	8260D
Trichlorofluoromethane					CAS #	75-69-4					
Second Quarter 2023	U J	U J	U J	U J	U J	1	1	0.4	0.4	1000	8260D
Third Quarter 2023	U	U	U	U	U	1	1	0.4	0.4	1000	8260D
2,4,5-Trichlorophenol					CAS #	95-95-4					
Third Quarter 2023	U	U	U	U	U	10	10	2	2	-	8270D
2,4,6-Trichlorophenol					CAS #	88-06-2					
Third Quarter 2023	U J	U J	U J	U J	U J	10	10	1.8	1.8	-	8270D
1,2,3-Trichloropropane					CAS #	96-18-4					
Third Quarter 2023	U	U	U	U	U	1	1	0.3	0.3	-	8260D
1,1,2-Trichloro-1,2,2-Trifluoroethane					CAS #	76-13-1					
Second Quarter 2023	U	U	U	U	U	1	1	0.4	0.4	59000	8260D
Third Quarter 2023	U	U	U	U	U	1	1	0.4	0.4	59000	8260D
O,O,O-Triethyl phosphorothioate					CAS #	126-68-1					
Third Quarter 2023	U	U	U	U	U	10	10	2.6	2.6	-	8270D
sym-Trinitrobenzene					CAS #	99-35-4					
Third Quarter 2023	U	U	U	U	U	9.3	10	2.8	3	-	8270E
Vinyl acetate					CAS #	108-05-4					
Third Quarter 2023	U	U	U	U	U	10	10	3.2	3.29	-	8260D
Vinyl chloride					CAS #	75-01-4					
Second Quarter 2023	U	U	U	U	U	1	1	0.2	0.2	2	8260D
Third Quarter 2023	U	U	U	0.23 J	U	1	1	0.2	0.2	2	8260D

Target Analyte Monitoring Results - HWMU-16 Point of Compliance Wells
Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 16C1 ***All Results in ug/L.***

Analtye/Quarter	16C1	16MW8	16MW9	16WC1A	16WC1B	QL	Permit QL	DL	Permit DL	GPS	Method
Xylenes (Total)					CAS #	1330-20-7					
Second Quarter 2023	U	U	U	U	U	3	3	0.4	0.4	10000	8260D
Third Quarter 2023	U	U	U	U	U	3	3	0.4	0.4	10000	8260D
m,p-Xylene					CAS #	179601-23-1					
Third Quarter 2023	U	U	U	U	U	2	2	0.4	0.4		8260D
o-Xylene					CAS #	95-47-6					
Third Quarter 2023	U	U	U	U	U	1	1	0.4	0.4		8260D

Definitions:

All inorganics reported as total unless noted.

The following definitions apply to results reported for Appendix IX monitoring events.

All Appendix IX monitoring results for compliance wells are reported to the detection limit.

Appendix IX Monitoring Events:

3Q2003, 2Q-2004, 2Q-2005, 3Q2006, 2Q2007, 2Q2008, 2Q2009, 2Q 2010,
2Q 2011, 2Q 2012, 2Q2013, 2Q2014, 2Q2015, 2Q2016, 2Q2017, 2Q2018, 2Q2019, 2Q2020, 4Q2021, 3Q2022, 3Q2023

QL Denotes permit required quantitation limit. Class 1 Permit Mod 5/5/21
U denotes not detected at or above the permit required detection limit. Class 1 permit mod 5/5/21.
UA denotes not detected at or above the adjusted detection limit.
J Denotes result is estimated. When used with "U" (i.e., "UJ"), denotes analyte not detected at or above the detection limit and detection limit and QL are estimated. When used with "UA" (i.e., "UAJ"), denotes analyte not detected at or above adjusted detection limit and adjusted detection limit and QL are estimated.
UN Denotes analyte concentration is less than the quantitation limit and/or five times the blank concentration. Not reliably detected due to blank contamination. This qualifier used only for Appendix IX monitoring event when compliance well results are reported to at or above the project detection limit.
R Denotes result rejected.
Q Denotes data validation qualifier. **X** Denotes mass spectral confirmation not obtained-result suspect.
Background Denotes background concentrations listed in Appendix G to Attachment 3 in the Final Hazardous Waste Post-Closure Care Permit for Hazardous Waste Units 5 and 16 (rev 2014, 2016, 2021), where applicable.
CAS# Denotes Chemical Abstract Services registration number.
GPS Denotes Groundwater Protection Standards listed in Appendix G to Attachment 3 in the Final Hazardous Waste Post-Closure Care Permit for Hazardous Waste Units 5 and 16 (October 4, 2002) (revised 2014, 2016, 2021).
NS denotes not sampled. **NA** denotes not analyzed.
"–" denotes not detected (pre-2nd Quarter 2003) or not available / not sampled (beginning 2nd Quarter 2003).

The following definitions apply to results reported for non-Appendix IX monitoring events.

All non-Appendix IX monitoring results for compliance wells are reported at or above the quantitation limit.

All inorganics reported as total unless noted.

QL Denotes permit required quantitation limit. Class 1 Permit Modification 5/5/21.
U Denotes analyte not detected at or above QL.
UA Denotes analyte not detected at or above adjusted sample QL.
J Denotes result is estimated. When used with "U" (i.e., "**UJ**"), denotes analyte not detected at or above QL and QL is estimated. When used with "UA" (i.e., "**UAJ**"), denotes analyte not detected at or above adjusted QL and adjusted QL is estimated.
UN Denotes analyte concentration is less than five times the blank concentration. Not reliably detected due to blank contamination.
R Denotes result rejected.
Q Denotes data validation qualifier.
Background Denotes background concentrations listed in Appendix G to Attachment 3 in the Final Hazardous Waste Post-Closure Care Permit for Hazardous Waste Units 5 and 16 (October 4, 2002), (revised 2014, 2016,2021), where applicable.
CAS# Denotes Chemical Abstract Services registration number.
GPS Denotes Groundwater Protection Standards listed in Appendix G to Attachment 3 in the Final Hazardous Waste Post-Closure Care Permit for Hazardous Waste Units 5 and 16 (October 4, 2002) (revised 2014, 2016,2021).

Target Analyte Monitoring Results At Or Above Permit Quantitation Limit
HWMU-16 Plume Monitoring Wells

Radford Army Ammunition Plant, Radford, Virginia

All Results in ug/L. ***Upgradient well = 16C1***

Analtye/Quarter	*16C1 Q*	*16-2 Q*	*16-3 Q*	*16-5 Q*	*16WC2B Q*	*16SPRING Q*	*QL*	*Permit QL*	*Background*	*Method*
Arsenic						*CAS # 7440-38-2*				
Second Quarter 2023	U	U	U	U	U	U	10	10	1	6020B
Third Quarter 2023	U	U	U	U	U	U	10	10	1	6020B
Barium						*CAS # 7440-39-3*				
Second Quarter 2023	210	230	820	180	120	230	10	10	175.4	6020B
Third Quarter 2023	200	240	800	180	120	220	10	10	175.4	6020B
Beryllium						*CAS # 7440-41-7*				
Second Quarter 2023	U	U	U	U	U	U	1	1	0.7	6020B
Third Quarter 2023	U	U	U	U	U	U	1	1	0.7	6020B
Cadmium						*CAS # 7440-43-9*				
Second Quarter 2023	U	U	U	U	U	U	1	1	0.2	6020B
Third Quarter 2023	U	U	U	U	U	U	1	1	0.2	6020B
Chromium						*CAS # 7440-47-3*				
Second Quarter 2023	U	U	U	U	U	U	5	5	6.2	6020B
Third Quarter 2023	U	U	U	U	U	U	5	5	6.2	6020B
Cobalt						*CAS # 7440-48-4*				
Second Quarter 2023	U	U	U	U	U	U	5	5	5	6020B
Third Quarter 2023	U	U	U	U	U	U	5	5	5	6020B
Copper						*CAS # 7440-50-8*				
Second Quarter 2023	U	U	U	U	U	U	5	5	13	6020B
Third Quarter 2023	U	U	U	U	U	U	5	5	13	6020B
Lead						*CAS # 7439-92-1*				
Second Quarter 2023	U	U	U	U	U	U	3	3	10	6020B
Third Quarter 2023	U	U	U	U	U	U	3	3	10	6020B
Mercury						*CAS # 7439-97-6*				
Second Quarter 2023	U	U	U	U	U	U	2	2	0.2	7470A
Third Quarter 2023	U	U	U	U	U	U	2	2	0.2	7470A
Nickel						*CAS # 7440-02-0*				
Second Quarter 2023	U	U	U	U	U	U	10	10	16	6020B
Third Quarter 2023	4 J	U	U	U	U	U	10	10	16	6020B
Vanadium						*CAS # 7440-62-2*				
Second Quarter 2023	U	U	U	U	U	U	10	10	151	6020B
Third Quarter 2023	U	U	U	U	U	U	10	10	151	6020B
Zinc						*CAS # 7440-66-6*				
Second Quarter 2023	U	U	U	U	U	U	30	30	51	6020B
Third Quarter 2023	U	U	U	U	U	U	30	30	51	6020B
Benzene						*CAS # 71-43-2*				
Second Quarter 2023	U	U	U	U	U	U	1	1	1	8260D
Third Quarter 2023	0.33 J	U	U	U	U	U	1	1	1	8260D
2-Butanone						*CAS # 78-93-3*				
Second Quarter 2023	U	U	U	U	U	U	10	10	1.1	8260D
Third Quarter 2023	U	U	U	U	U	U	10	10	1.1	8260D
Carbon tetrachloride						*CAS # 56-23-5*				
Second Quarter 2023	U	U	U	U	U	U	1	1	0.2	8260D
Third Quarter 2023	U	U	U	U	U	U	1	1	0.2	8260D

See last page of this report for definitions.

Target Analyte Monitoring Results At Or Above Permit Quantitation Limit
HWMU-16 Plume Monitoring Wells
Radford Army Ammunition Plant, Radford, Virginia

All Results in ug/L. ***Upgradient well = 16C1***

Analtye/Quarter	16C1	Q	16-2	Q	16-3	Q	16-5	Q	16WC2B	Q	16SPRING	Q	QL	Permit QL	Background	Method
Chloroethane											CAS # 75-00-3					
Second Quarter 2023	1.1		U		U		U		U		U		1	1	20.7	8260D
Third Quarter 2023	3.4		U		U		U		U		U		1	1	20.7	8260D
Dichlorodifluoromethane											CAS # 75-71-8					
Second Quarter 2023	U		U		U		U		U		U		1	1	46.5	8260D
Third Quarter 2023	U		U		U		U		U		U		1	1	46.5	8260D
1,1-Dichloroethane											CAS # 75-34-3					
Second Quarter 2023	4.8		U		U		U		U		U		1	1	9.5	8260D
Third Quarter 2023	5.2		U		U		U		U		U		1	1	9.5	8260D
1,1-Dichloroethene											CAS # 75-35-4					
Second Quarter 2023	U		U		U		U		U		U		1	1	1	8260D
Third Quarter 2023	U		U		U		U		U		U		1	1	1	8260D
Diethyl ether											CAS # 60-29-7					
Second Quarter 2023	11		U		U		U		U		U		10	12.5	75.5	8260D
Third Quarter 2023	33	J	U	J	U	J	U	J	U	J	U	J	10	12.5	75.5	8260D
Diethyl phthalate											CAS # 84-66-2					
Second Quarter 2023	U		U		U		U		U		U		5	5	5	8270E
Third Quarter 2023	U		U		U		U		U		-		5	5	5	8270D
Third Quarter 2023	-		-		-		-		-		U		5.1	5	5	8270D
Dimethyl ether											CAS # 115-10-6					
Second Quarter 2023	U		U		U		U		U		U		10	12.5	17.0	8260C
Third Quarter 2023	7.7	J	U		U		U		U		U		10	12.5	17.0	8260C
2,4-Dinitrotoluene											CAS # 121-14-2					
Second Quarter 2023	U		U		U		U		U		U		10	10	10	8270E
Third Quarter 2023	U		U		U		U		U		U		10	10	10	8270D
2,6-Dinitrotoluene											CAS # 606-20-2					
Second Quarter 2023	U		U		U		U		U		U		10	10	10	8270E
Third Quarter 2023	U		U		U		U		U		U		10	10	10	8270D
Ethylbenzene											CAS # 100-41-4					
Second Quarter 2023	U		U		U		U		U		U		1	1	0.1	8260D
Third Quarter 2023	U		U		U		U		U		U		1	1	0.1	8260D
Chloromethane											CAS # 74-87-3					
Second Quarter 2023	U		U		U		U		U		U		1	1	0.3	8260D
Third Quarter 2023	U		U		U		U		U		U		1	1	0.3	8260D
Methylene chloride											CAS # 75-09-2					
Second Quarter 2023	U		U		U		U		U		U		1	1	13.95	8260D
Third Quarter 2023	U		U		U		U		U		U		1	1	13.95	8260D
Tetrachloroethene											CAS # 127-18-4					
Second Quarter 2023	U		U		U		U		U		U		1	1	0.7	8260D
Third Quarter 2023	U		U		U		U		U		U		1	1	0.7	8260D
Tetrahydrofuran											CAS # 109-99-9					
Second Quarter 2023	U		U		U		U		U		U		25	25	25	8260D
Third Quarter 2023	16	J	U		U		U		U		U		25	25	25	8260D

Target Analyte Monitoring Results At Or Above Permit Quantitation Limit
HWMU-16 Plume Monitoring Wells

Radford Army Ammunition Plant, Radford, Virginia

All Results in ug/L. ***Upgradient well = 16C1***

Analtye/Quarter	*16C1 Q*	*16-2 Q*	*16-3 Q*	*16-5 Q*	*16WC2B Q*	*16SPRING Q*	*QL*	*Permit QL*	*Background*	*Method*
Toluene						*CAS # 108-88-3*				
Second Quarter 2023	U	U	U	U	U	U	1	1	0.1	8260D
Third Quarter 2023	U	U	U	U	U	U	1	1	0.1	8260D
1,1,1-Trichloroethane						*CAS # 71-55-6*				
Second Quarter 2023	U	U	U	U	U	U	1	1	9.2	8260D
Third Quarter 2023	U	U	U	U	U	U	1	1	9.2	8260D
Trichloroethene						*CAS # 79-01-6*				
Second Quarter 2023	U	U	U	U	U	U	1	1	0.1	8260D
Third Quarter 2023	U	U	U	U	U	U	1	1	0.1	8260D
Trichlorofluoromethane						*CAS # 75-69-4*				
Second Quarter 2023	U J	U J	U J	U J	U J	U J	1	1	11.3	8260D
Third Quarter 2023	U	U	U	U	U	U	1	1	11.3	8260D
1,1,2-Trichloro-1,2,2-Trifluoroethane						*CAS # 76-13-1*				
Second Quarter 2023	U	U	U	U	U	U	1	1	1.2	8260D
Third Quarter 2023	U	U	U	U	U	U	1	1	1.2	8260D
Vinyl chloride						*CAS # 75-01-4*				
Second Quarter 2023	U	U	U	U	U	U	1	1	1	8260D
Third Quarter 2023	U	U	U	U	U	U	1	1	1	8260D
Xylenes (Total)						*CAS # 1330-20-7*				
Second Quarter 2023	U	U	U	U	U	U	3	3	0.2	8260D
Third Quarter 2023	U	U	U	U	U	U	3	3	0.2	8260D

All plume monitoring wells reported to at or above the permit quantitation limit except for the upgradient well during the Appendix IX monitoring event where results are reported for the upgradient well to at or above the detection limit (DL). All inorganics reported as total unless noted.

Q Donotes data validation qualifier.
QL Denotes permit required quantitation limit.
U Denotes analyte not detected at or above QL. 5/5/2021 Class 1 Permit Mod
UA Denotes analyte not detected at or above adjusted sample QL.
J Denotes result is estimated. When used with "U" (i.e., "**UJ**"), denotes analyte not detected at or above QL and QL is estimated. When used with "UA" (i.e., "**UAJ**"), denotes analyte not detected at or above adjusted QL and adjusted QL is estimated.
UN Denotes analyte concentration is less than five times the blank concentration. Not reliably detected due to blank contamination.
R Denotes result rejected.
Q Denotes data validation qualifier.
Background Denotes background concentrations listed in Appendix F to Attachment 3 in the Final Hazardous Waste Post-Closure Care Permit for Hazardous Waste Units 5 and 16 (October 4, 2002), (revised 2014, Dec 1,2016, May 5, 2021), where applicable.
CAS# Denotes Chemical Abstract Services registration number.
GPS Denotes Groundwater Protection Standards listed in Appendix G to Attachment 5 in the Final Hazardous Waste Post-Closure Care Permit for Hazardous Waste Units 5 and 16 (October 4, 2002) (revised 2014, 2016,2021).

APPENDIX B-4

ESTABLISHED BACKGROUND VALUES AND COMPUTATIONS FOR HWMU-16

- It was not understood why the majority of fluorescein detections were considered false positive detections. The basis of this observation is unclear considering a lack of background and laboratory confirmation results.

- It was not apparent why certain samples were selected for laboratory confirmation and others were not. There was no apparent consistency in the selection of samples for laboratory confirmation.

- Samples were submitted for confirmation laboratory analyses three months or more following the collection of the samples in the field. No information was provided regarding the custody and/or storage of the samples. The samples were submitted to the analytical laboratory with incomplete chain-of-custody (COC), and the COC documentation was not completed by the laboratory.

In summary, the data from the study do not provide the basis for meaningful interpretation. Any attempt to formulate conclusions from the data as presented regarding the presence of preferred or predominant groundwater flow patterns is not warranted or recommended.

3.3 HWMU-16 GROUNDWATER MONITORING ANALYTE LIST

The groundwater monitoring analyte list for HWMU-16 is presented in **Table 1 (Appendix B)**. The list represents the subset of the constituents listed in Appendix III of 40 CFR Part 261 that previously have been detected in the groundwater and/or that are reasonably expected to be in or derived from waste contained in HWMU-16. As discussed in Section 3.5.2 below, 12 inorganic constituents and two explosive/propellant constituents have been detected in the groundwater monitoring network for HWMU-16 at statistically significant concentrations above the Unit's calculated background concentrations. The inorganic constituents may be derived from the aquifer formation materials; however, the two explosive/propellant constituents (2,4-Dinitrotoluene and 2,6-Dinitrotoluene) are byproducts of wastes derived from explosives. Therefore, the two explosive/propellant constituents detected could only be from HWMU-16.

The concentration limits established for the hazardous constituents also are listed in **Table 1**. The concentration limits represent either background concentrations calculated for the constituents in this GWQAR, Maximum Concentrations of Constituents for Ground-water Protection listed in Table 1 of 40 CFR 264.94, USEPA Drinking Water Standard Maximum Contaminant Levels (MCLs), or alternate concentration limits (ACLs) established by the VDEQ (July 1998). Certain organic constituents on the list do not have USEPA MCLs or VDEQ ACLs; they also do not have calculated background concentrations because they have not been detected in the Unit's upgradient well. Therefore, the concentration limits for these constituents are equal to their respective method detection limits.

As Alliant discussed with the VDEQ in the past, the reliability of previous laboratory analytical data - particularly dissolved metals data - appeared to be questionable in some cases. In an April 9, 1996 letter to C. Jake (Alliant), the VDEQ agreed that only total metals concentrations in groundwater would be measured, as described in a USEPA Region III guidance on groundwater sampling in karst terrain. Therefore, all references to metals concentrations in this GWQAR refer to <u>total</u> metals concentrations.

3.4 HWMU-16 GROUNDWATER BACKGROUND CONCENTRATIONS

Background concentrations were calculated for each constituent in the groundwater monitoring program using the analytical data from 1996 through 1998 for upgradient well 16C1.

The background concentration calculations were based on site wide 95% confidence, 95% coverage upper prediction intervals. The calculated background concentrations are listed in **Table 2 (Appendix B)**. The background concentrations were used to construct the outermost closing contours on the Isoconcentration Maps (**Appendix A**).

3.5 HWMU-16 STATISTICAL ANALYSIS

Statistical evaluations for HWMU-16 are performed annually and submitted to the VDEQ in accordance with the annual reporting requirements specified in 40 CFR 265.94. As part of this GWQAR, statistical evaluations were performed on Fourth Quarter 1998 analytical data in accordance with the procedures and guidance provided in the following documents:

- Title 40 of the Code of Federal Regulations, 40 CFR 264.97 and 264.98;
- VDEQ Guidance for statistical analysis titled "Data Analysis Plan," undated;
- Interim Final Guidance for Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, USEPA, April 1989;
- Addendum to Interim Final Guidance for Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, USEPA, July 1992; and
- Statistical Methods for Groundwater Monitoring, Gibbons, R.D., 1994.

Statistical threshold values were computed for the 54 constituents for which HWMU-16 is currently monitored based on the concentrations of those constituents in upgradient (background) well 16C1. All data starting with First Quarter 1996 to Fourth Quarter 1998 were used for this purpose. The 1996 through 1998 monitoring data have been submitted previously to the VDEQ by Alliant in quarterly monitoring reports; therefore, the data are not listed in this GWQAR. Statistical comparisons were performed for the Fourth Quarter 1998 data set. Comparison statistical analyses were performed for all constituents which were detected in any downgradient well during that event.

3.5.1 Background Data and Statistical Comparisons

Statistical analyses were performed using the analytical results from upgradient well 16C1 data as background data. Based on the percentage of non-detects and the distribution of the background data, methods of statistical comparisons varied. Background average, standard deviation and other descriptive statistical data were computed for all constituents and are presented in **Appendix C**.

The constituents listed below were 100% non-detected in the background data. The background threshold levels (BTLs) for these constituents were established as equal to their detection limits (DL). Detections of these constituents in the downgradient wells during Fourth Quarter 1998 were compared to these BTLs.

Background Threshold Level (BTL) = Detection Limit (DL)				
Parameter	Sample Size	% Non-Detects	DL (µg/l)	BTL (µg/l)
Antimony	12	100	3	3
Arsenic	12	100	1	1
Bromoform	12	100	0.3	0.3
Carbon tetrachloride	12	100	0.2	0.2
Chlorobenzene	12	100	0.1	0.1
Chloromethane	12	100	0.3	0.3
Cyanide	12	100	10	10

Background Threshold Level (BTL) = Detection Limit (DL)				
Parameter	Sample Size	% Non-Detects	DL (µg/l)	BTL (µg/l)
Di-n-butyl phthalate	12	100	5	5
1,2-Dichloroethane	12	100	0.1	0.1
trans-1,2-Dichloroethene	12	100	0.1	0.1
1,4-Dichlorobenzene	12	100	0.1	0.1
Ethylbenzene	12	100	0.1	0.1
Mercury	12	100	0.2	0.2
Methyl ethyl ketone	12	100	1.1	1.1
Selenium	12	100	1	1
1,1,2,2-Tetrachloroethane	12	100	0.3	0.3
1,1,2-Trichloroethane	12	100	0.5	0.5
Trichloroethene	12	100	0.1	0.1
Toluene	12	100	0.1	0.1
2378-TCDF	12	100	0.0485 ppt	0.0485 ppt
12378-PECDF	12	100	0.0439 ppt	0.0439 ppt
23478-PECDF	12	100	0.0417 ppt	0.0417 ppt
123478-HXCDF	12	100	0.0390 ppt	0.0390 ppt
123678-HXCDF	12	100	0.0377 ppt	0.0377 ppt
234678-HXCDF	12	100	0.0428 ppt	0.0428 ppt
123789-HXCDF	12	100	0.0415 ppt	0.0415 ppt
1234678-HPCDF	12	100	0.0615 ppt	0.0615 ppt
1234789-HPCDF	12	100	0.0709 ppt	0.0709 ppt
OCDF	12	100	0.1307 ppt	0.1307 ppt

Non-parametric prediction intervals were computed for all of the constituents for which the data from background well 16C1 satisfied one of the following two criteria, per VDEQ regulations and guidance as well as USEPA guidance:

- Percentage of non-detects was greater than or equal to 50 and less than 100; or
- Percentage of non-detects was less than 50, but data was not normally distributed in original or log-transformed mode.

The background threshold levels for these constituents were set as equal to their upper prediction limits (UPLs). The background and relevant statistical data for these constituents are summarized below. The confidence level and false positive rate were calculated based on the number of background data points available and number of future comparisons. For all constituents, the confidence level was determined to be equal to 0.933, and the false positive rate was equal to 0.067. Since the upper control limit of a non-parametric interval cannot be adjusted for multiple comparisons and inadequate number of background data, the number of resampling events required was adjusted to account for the high error rates inherent in those situations. The number of confirmation resamples required for all constituents is 2. The background and relevant statistical data for these constituents are summarized below. Associated statistical computations are presented in **Appendix C**.

BTL = Upper Prediction Limit of Non-parametric Prediction Interval w/false positive rate=0.067				
Parameter	Sample Size	% Non-Detects	DL (µg/l)	BTL (µg/l)
Beryllium	12	75	0.2	0.7
Cadmium	12	75	0.1	0.2
Cobalt	12	75	1	5
Copper	12	50	1	13
1,1-Dichloroethane	12	0	0.2	9.5
2,4-Dinitrotoluene	12	92	0.08	0.10

BTL = Upper Prediction Limit of Non-parametric Prediction Interval w/false positive rate=0.067				
Parameter	Sample Size	% Non-Detects	DL (µg/l)	BTL (µg/l)
2,6-Dinitrotoluene	12	75	0.08	0.11
Lead	12	42	1	10
Nickel	12	92	15	16
Silver	12	75	0.2	0.5
Thallium	12	67	1	6
TOC	12	75	1000	7000
1,1,1-Trichloroethane	12	17	0.3	9.2
Vanadium	12	83	4	151
Vinyl Chloride	12	92	0.1	0.1
Xylene (total)	12	92	0.1	0.2
Zinc	12	50	5	51

Chromium exhibited normally distributed data (excluding non-detects) with between 25% and 50% non-detects in the background well. The mean and standard deviation of the background data for chromium were adjusted using Cohen's Maximum Likelihood Estimator Method (1959, 1961). A one-sided parametric prediction interval was then computed for chromium based on the adjusted mean and standard deviation. The Upper Prediction Limit was set as the BTL for chromium. The background and relevant statistical data for chromium are summarized below. Cohen's adjustment computations and prediction interval computations are presented in **Appendix C**.

BTL = Upper Prediction Limit of Prediction Interval w/false positive rate=0.05 Original Mean = 3.54, Original SD = 1.933 Adjusted Mean = 3.642. Adjusted SD = 1.95				
Parameter	Sample Size	% Non-Detects	DL (µg/l)	BTL (µg/l)
Chromium	12	25	1	6.2

The following constituents exhibited normally distributed background data with less than 25% non-detects. One sided parametric prediction intervals were computed on the background data for all of these constituents. The UPLs for these constituents were set as their respective BTLs, with one exception. For pH, a two-sided parametric prediction interval was computed; therefore, the BTL for pH consisted of a range between the lower prediction limit (LPL) and the upper prediction limit. The background concentration calculations were based on a site wide 95% confidence, 95% coverage upper prediction intervals. When adjusted for multiple comparisons of the background data, the minimum required false positive rate was below 1% (0.01). A 99% confidence level (0.01 false positive rate) was used for all individual comparisons, which with the most conservative assumptions provided a site-wide false positive rate of >0.05 for all constituents. The background and relevant statistical data for these constituents are summarized below. The prediction interval computations for these constituents are presented in **Appendix C**.

BTL = UPL of one-sided Prediction Interval (exception pH) w/site-wide false positive rate>0.05 (individual comparisons false positive rate=0.01) BTL for pH = LPL – UPL of two-sided Prediction Interval				
Parameter	Sample Size	% Non-Detects	DL (µg/l)	BTL (µg/l)
Barium	12	0	2	175.4
Dichlorodifluoromethane	12	8	0.3	46.5
Tetrachloroethene	12	17	0.1	0.7
TOX	12	17	5	42.2

BTL = UPL of one-sided Prediction Interval (exception pH) w/site-wide false positive rate>0.05 (individual comparisons false positive rate=0.01) BTL for pH = LPL – UPL of two-sided Prediction Interval				
Parameter	**Sample Size**	**% Non-Detects**	**DL (µg/l)**	**BTL (µg/l)**
Trichlorofluoromethane	12	0	0.5	11.3
Specific Conductivity	8	0	1 µS/cm	672 µS/cm
pH	8	0	0.1 pH units	5.7 to 7.9 pH units

3.5.2 Results of Statistical Comparisons

The following table lists the constituents which were detected during the Fourth Quarter 1998 event at concentrations exceeding their respective background threshold levels (BTLs), and the downgradient wells in which they were detected.

Parameter	Monitoring Well(s)
Arsenic	16-5, 16WC2B
Barium	16-2, 16-3, 16-5, 16WC1A, 16WC1B, 16WC2B, 16SPRING
Beryllium	16WC1B, 16WC2B
Cadmium	16WC1B
Chromium	16-3, 16-5, 16WC1B, 16WC2B
Cobalt	16-5, 16WC1B, 16WC2B
Copper	16-5, 16WC1B, 16WC2B
Lead	16WC1B
Mercury	16WC1B
Nickel	16-5, 16WC1A, 16WC2B
Selenium	16-5, 16WC1B, 16WC2B
Zinc	16WC1B
2,4-Dinitrotoluene	16-3, 16-5, 16WC1B, 16WC2B, 16SPRING
2,6-Dinitrotoluene	16WC1A, 16WC1B

Any HWMU-16 target constituents not listed above were not detected in the downgradient monitoring wells at concentrations exceeding their respective BTLs.

3.6 HWMU-16 PLUME DELINEATIONS

In accordance with VDEQ instructions presented during the May 19, 1999 meeting between Alliant and the VDEQ, Isoconcentration Maps were produced to depict constituent plumes in the groundwater beneath the site (**Appendix A**). In order to evaluate the shape and position of constituent plumes over time, historical Isoconcentration Maps were developed using the historical maximum concentrations for the constituents monitored at the site for the time periods of 1992 through 1995 and 1996 through 1998. The historical maximum concentrations for these time periods are listed in **Tables 3** and **4**, respectively (**Appendix B**).

Groundwater analytical data collected prior to 1992 were not included in the evaluation of historical maximum concentrations. The data collected prior to 1992 are considered unreliable due to "order-of-magnitude" variations in parameter concentrations from quarter to quarter, as well as a general lack of laboratory QA/QC. Additionally, the groundwater monitoring analyte lists prior to 1992 did not include many of the parameters on the current groundwater monitoring analyte list for HWMU-16.

TABLE 2
HWMU-16
Calculated Background Values

Constituent	Background Concentration (µg/l unless otherwise noted)
Antimony	3
Arsenic	1
Barium	175.4
Beryllium	0.7
Cadmium	0.2
Chromium	6.2
Cobalt	5
Copper	13
Lead	10
Mercury	0.2
Nickel	16
Selenium	1
Silver	0.5
Thallium	6
Vanadium	151
Zinc	51
Bromoform	0.3
Carbon Tetrachloride	0.2
Chlorobenzene	0.1
Chloromethane	0.3
1,4-Dichlorobenzene	0.1
Dichlorodifluoromethane	46.5
1,1-Dichloroethane	9.5
1,2-Dichloroethane	0.1
trans-1,2-Dichloroethene	0.1
Ethylbenzene	0.1
Methyl Ethyl Ketone	1.1
1,1,2,2-Tetrachloroethane	0.3
Tetrachloroethene	0.7
Toluene	0.1
1,1,1-Trichloroethane	9.2
1,1,2-Trichloroethane	0.5
Trichloroethene	0.1
Trichlorofluoromethane	11.3
Vinyl Chloride	0.1
Xylenes (total)	0.2

TABLE 2
HWMU-16
Calculated Background Values

Constituent	Background Concentration (µg/l unless otherwise noted)
Di-n-butylphthalate	5
2,4-Dinitrotoluene	0.10
2,6-Dinitrotoluene	0.11
2378-TCDF	0.0485 ppt
12378-PECDF	0.0439 ppt
23478-PECDF	0.0417 ppt
123478-HXCDF	0.0390 ppt
123678-HXCDF	0.0377 ppt
234678-HXCDF	0.0428 ppt
123789-HXCDF	0.0415 ppt
1234678-HPCDF	0.0615 ppt
1234789-HPCDF	0.0709 ppt
OCDF	0.1307 ppt
Cyanide	10
Total Organic Carbon (x4)	7000
Total Organic Halides (x4)	42.2
Specific Conductivity	672 µS/cm
pH	5.7 to 7.9 pH units

Appendix IX Constituents Detected Since Permit Issuance
HWMUs 5, 7, 10, and 16
Radford Army Ammunition Plant

Unit	Quarter Initially Detected	Constituent	Background--Calculated or QL?	Background (ug/L)	GPS Required? (261 Appendix VIII)	Proposed GPS (ug/L)	Source
HMWU-5	Fourth Quarter 2003	Chromium	QL	5	yes	100	USEPA MCL
		Diethyl Ether	QL	12	no	NA	NA
		2-Nitroaniline	QL	20	no	NA	NA
		4-Nitroaniline	QL	20	yes	20	Background/QL
		Nitrobenzene	QL	10	yes	10	Background/QL
	Third Quarter 2006	Dichlorodifluoromethane	QL	1	yes	125.2	VDEQ ACL
HWMU-7	Third Quarter 2003	Copper	Calculated	49	no	NA	NA
	Second Quarter 2004	Zinc	Calculated	217	no	NA	NA
HWMU-10	First Quarter 2003	Cobalt	QL	5	no	NA	NA
	Second Quarter 2003	Vanadium	QL	10	no	NA	NA
	Second Quarter 2005	Acetone	QL	10	no	NA	NA
		2-Propanol	QL	50	no	NA	NA
HWMU-16	Second Quarter 2003	Chloroethane	Calculated	20.7	yes	20.7	Background/QL
		Diethyl Ether	Calculated	75.5	no	NA	NA
		Dimethyl Ether	Calculated	17.0	no	NA	NA
	Third Quarter 2003	Methylene Chloride	Calculated	13.95	no*	NA	NA
	Second Quarter 2004	1,1,2-Trichloro-1,2,2-trifluoroethane	Calculated	1.2	no*	NA	NA

HWMU-5: The additional Appendix IX constituents detected in the downgradient point of compliance wells were not detected above their respective Quantitation Limits (QLs) in the upgradient well. As a result, background concentrations for those constituents were set as equal to their respective QLs. In accordance with the Permit (Condition V.J.1.g.), GPS are proposed for those additional Appendix IX constituents that are listed in Appendix VIII of 40 CFR Part 261 (chromium, 4-nitroaniline, nitrobenzene, and dichlorodifluoromethane). No GPS are proposed for the additional Appendix IX constituents that are not listed in Appendix VIII of 40 CFR Part 261 (diethyl ether and 2-nitroaniline).

HWMU-7: Background concentrations for the additional Appendix IX constituents detected in the downgradient point of compliance wells (copper and zinc) were previously calculated and submitted to the VDEQ in the August 1998 *Groundwater Quality Assessment Report for HWMU-7* prepared by ERM, Inc. In accordance with the Permit (Condition V.J.2.g.), no GPS are proposed for the additional Appendix IX constituents (copper and zinc), as they are not listed in Appendix VIII of 40 CFR Part 261.

HWMU-10: The additional Appendix IX constituents detected in the downgradient point of compliance wells were not detected above their respective Quantitation Limits (QLs) in the upgradient well. As a result, background concentrations for those constituents were set as equal to their respective QLs. In accordance with the Permit (Condition V.J.3.g.), no GPS are proposed for the additional Appendix IX constituents (cobalt, vanadium, acetone, and 2-propanol), as they are not listed in Appendix VIII of 40 CFR Part 261.

HWMU-16: Background concentrations for additional Appendix IX constituents chloroethane, diethyl ether, dimethyl ether, and methylene chloride were calculated using data collected from upgradient well 16C1 during the period from Third Quarter 2003 through Third Quarter 2004. The background concentration for additional Appendix IX constituent 1,1,2-trichloro-1,2,2-trifluoroethane was calculated using data collected from upgradient well 16C1 during the period from Second Quarter 2004 through Third Quarter 2006.
In accordance with the Permit (Condition V.J.4.g.), GPS are proposed for additional Appendix IX constituents that are listed in Appendix VIII of 40 CFR Part 261 (chloroethane). No GPS are proposed for the additional Appendix IX constituents that are not listed in Appendix VIII of 40 CFR Part 261 (diethyl ether and dimethyl ether).
*Methylene chloride and 1,1,2-trichloro-1,2,2-trifluoroethane should not be added to the Groundwater Monitoring List for HWMU-16, as these constituents were only detected in the upgradient well for the Unit, and not in the downgradient point of compliance wells.

Statistical Computations – RAAP HWMU-16 – 1,1,2-Trichloro-1,2,2-Trifluoroethane

In accordance with the facility permit and VHWMR, statistical background concentration is being established for 1,1,1-Trichloro-1,2,2-Trifluoroethane. Inter-well upper prediction limits (UPL) were calculated on the background data for this target parameter in accordance with the facility permit and VHWMR (40 CFR 264.97(h)). Background data for this target parameter consisted of all data for the background well 16C1 collected from 2nd quarter 2004 through 3rd quarter 2006.

Discussion of Tests for Normality

The power of a statistical tool to account for false positive and false negative results, while accurately detecting true statistical variations for a facility under scrutiny depends on numerous factors, one of which is the distribution of the data. A great number of statistical tools are based on the assumption that data are normally distributed. Hence the distribution of the sample population for parameters evaluated under this statistical analysis is first determined. Sample populations are tested for normal distribution using several normality tests. "Groundwater Information Tracking System with Statistical Analysis Capability" (GRITS/STAT) v5.0 was the software used to run these statistical tests. GRITS/STAT is an analytical software package provided by the USEPA. The distributions of the data sets were verified in the original mode as well as in log-transformed mode. The normality of the data set was evaluated using the Shapiro-Wilk test for normality.

Discussion of Prediction Interval Tests

Normality tests are performed prior to running parametric tests (tests that require that the data be normal). Results of the normality tests show that the background data for 1,1,2-Trichloro-1,2,2-Trifluoroethane is non-normally distributed. Non-parametric UPL (NUPL) was constructed on the background data for this parameter. The confidence levels of NUPLs are typically approximate and estimated to be around 91%.

Summary of UPL

Parameter	Background Data Distribution	Type of UPL	Multiple Comparisons/year	UPL (µg/l)
1,1,2-Trichloro-1,2,2-Trifluoroethane	Non-Normal	NUPL	N/A	1.2

Statistical Computations – RAAP HWMU-16

In accordance with the facility permit and VHWMR, statistical background concentrations are being established for the four new target parameters chloroethane, diethyl ether, dimethyl ether and methylene chloride. These four target parameters were added to the facility monitoring program during the 3rd quarter 2003 monitoring event. Inter-well upper prediction limits (UPL) were calculated on the background data for the target parameters in accordance with the facility permit and VHWMR (40 CFR 264.97(h)). Background data for these target parameters consisted of all data for the background well 16C1 collected from 3rd quarter 2003 through 3rd quarter 2004.

Discussion of Tests for Normality

The power of a statistical tool to account for false positive and false negative results, while accurately detecting true statistical variations for a facility under scrutiny depends on numerous factors, one of which is the distribution of the data. A great number of statistical tools are based on the assumption that data are normally distributed. Hence the distribution of the sample population for parameters evaluated under this statistical analysis is first determined. Sample populations were tested for normal distribution using several normality tests. "Groundwater Information Tracking System with Statistical Analysis Capability" (GRITS/STAT) v5.0 was the software used to run these statistical tests. GRITS/STAT is an analytical software package provided by the USEPA. The distributions of the data sets were verified in the original mode as well as in log-transformed mode. The normality of the data sets was evaluated using the Shapiro-Wilk test for normality.

Discussion of Prediction Interval Tests

Normality tests are performed prior to running parametric tests (tests that require that the data be normal). A 99% confidence parametric inter-well UPL was computed for each of the four target parameters that showed normally distributed background data. Results of the normality tests show that the background data for chloroethane, diethyl ether and methylene chloride are normally distributed, and the background data for dimethyl ether is non-normally distributed. Non-parametric UPL (NUPL) was constructed on the background data for dimethyl ether, and parametric UPLs (PUPL) were constructed on the background data for chloroethane, diethyl ether and methylene chloride. No adjustments to the error rates were made to the NUPLs for multiple comparisons. Adjustment for 10 comparisons per year (considering 10 compliance monitoring wells at the facility and 4 quarters of data for each year, and considering historic detects, 10 is considered a representative number for multiple comparisons per year) was made to the PUPLs. The confidence levels of NUPLs are well less than 95%. Any statistically significant increase (SSI) must be confirmed by verification sampling.

Summary of UPLs

Parameter	Background Data Distribution	Type of UPL	Multiple Comparisons/year	UPL (µg/l)
Chloroethane	Normal	PUPL	10	20.7
Diethyl ether	Normal	NUPL	10	75.5
Dimethyl ether	Non-normal	PUPL	N/A	17.0
Methylene Chloride	Normal	PUPL	10	13.95

RAAP-HWMU-16 - Statistical Analysis - Notes

1) Y2K Correction dates are as shown in table below.

Actual Event	Date Used in Stat Software
2000-Qtr1	12/13/1999
2000-Qtr2	12/14/1999
2000-Qtr3	12/15/1999
2000-Qtr4	12/16/1999
2001-Qtr1	12/17/1999
2003-Qtr3	12/18/1999
2003-Qtr4	12/19/1999
2004-Qtr1	12/20/1999
2004-Qtr2	12/21/1999
2004-Qtr3	12/22/1999

Interwell Tests:
2) Background data for target parameters chloroethane, diethyl ether, dimethyl ether and methylene chloride were evaluated using Shapiro-Wilk test. Background data showed normal distribution for chloroethane, diethyl ether and methylene chloride. Parametric interwell 99% confidence upper prediction limits were computed for parameters with normally distributed background data. Dimethyl ether background data was non-normally distributed. Therefore non-parametric Upper Prediction Limit (UPL) was computed for dimethyl ether.

3) No adjustments for multiple comparisons could be made for non-parametric UPLs. Adjustments were made to the parametric UPLs for 10 future comparisons per year to account for multiple compliance monitoring wells and quarterly event data. Any Statistically significant increase (SSI) must be confirmed by verification sampling.

E:\Ross Work\Radford AAP Archives\HWMU-16\[HWMU16StatDate correction.xls]Sheet1

Normality Tests

Report Printed: 02-02-2005 13:49

Facility:RAAPHWMU16 Haz. Waste Unit 16 - RAAP

Address:

City:Radford ST:VA Zip:24141
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:ClEthane Chloroethane

CAS Number: 75-00-3
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 2.000 ppb

Start Date:Mar 31 1996
End Date:Dec 22 1999

Normality Test on Observations for wells listed below:

Well:16C1 Position:Upgradient Observations:5

Scale	Minimum	Maximum	Mean	Std Dev
Original:	1.000	6.400	4.340	2.078
Log:	0.000	1.856	1.303	0.749

Pooled Statistics
Observations: 5

Statistic	Original Scale	Log Scale
Mean:	4.340	1.303
Std Dev:	2.078	0.749
Skewness:	-0.810	-1.296*
Kurtosis:	-0.555	-0.011
Minimum:	1.000	0.000
Maximum:	6.400	1.856
CV:	0.479	0.575

Shapiro-Wilk Statistics

Scale	Test Statistic	5% Critical Value	1% Critical Value
Original:	0.9037	0.7620	0.6860

Log:	0.7615*	0.7620	0.6860

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

Parametric Prediction Interval
Report Printed February 2,2005

Facility:Haz. Waste Unit 16 - RAAP
Parameter:Chloroethane(CAS Number:75-00-3)

ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL

Observations (n):	5
Shapiro-Wilk (W):	0.9037
Critical W,α=0.01:	0.6860
Mean:	4.340 ppb
Std Dev:	2.078 ppb
DF:	4
Conf. Level (1-α):	~~0.9500~~ 0.99
Future Samples (k):	10
$t_{\left[\frac{1-\alpha}{k}\right]}$:	7.1732
Kappa:	7.8579
UL:	20.669 ppb
LL:	$-\infty$

Report Produced by GRITS/STAT 5.01

Normality Tests

Report Printed: 02-02-2005 13:49

Facility:RAAPHWMU16 Haz. Waste Unit 16 - RAAP

Address:

City:Radford ST:VA Zip:24141
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:DEthEth Diethyl ether

CAS Number: - -
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 24.000 ppb

Start Date:Mar 31 1996
End Date:Dec 22 1999

Normality Test on Observations for wells listed below:

Well:16C1 Position:Upgradient Observations:5

Scale	Minimum	Maximum	Mean	Std Dev
Original:	12.000	30.000	21.200	6.907
Log:	2.485	3.401	3.007	0.355

Pooled Statistics
Observations: 5

Statistic	Original Scale	Log Scale
Mean:	21.200	3.007
Std Dev:	6.907	0.355
Skewness:	-0.122	-0.491
Kurtosis:	-1.140	-1.024
Minimum:	12.000	2.485
Maximum:	30.000	3.401
CV:	0.326	0.118

Shapiro-Wilk Statistics

Scale	Test Statistic	5% Critical Value	1% Critical Value
Original:	0.9768	0.7620	0.6860

Log:	0.9507	0.7620	0.6860

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

Parametric Prediction Interval
Report Printed February 2,2005

Facility:Haz. Waste Unit 16 - RAAP
Parameter:Diethyl ether(CAS Number:- -)

ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL

Observations (n):	5
Shapiro-Wilk (W):	0.9768
Critical W,α=0.01:	0.6860
Mean:	21.200 ppb
Std Dev:	6.907 ppb
DF:	4
Conf. Level (1-α):	~~0.9500~~ 0.99
Future Samples (k):	10
$t_{\left[\frac{1-\alpha}{k}\right]}$:	7.1732
Kappa:	7.8579
UL:	75.470 ppb
LL:	$-\infty$

Report Produced by GRITS/STAT 5.01

Normality Tests

Report Printed: 02-02-2005 13:53

Facility:RAAPHWMU16 Haz. Waste Unit 16 - RAAP

Address:

City:Radford ST:VA Zip:24141
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:DMethEth Dimethyl ether

CAS Number: - -
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 24.000 ppb

Start Date:Mar 31 1996
End Date:Dec 22 1999

Normality Test on Observations for wells listed below:

Well:16C1 Position:Upgradient Observations:5

Scale	Minimum	Maximum	Mean	Std Dev
Original:	12.000	17.000	13.000	2.236
Log:	2.485	2.833	2.555	0.156

Pooled Statistics
Observations: 5

Statistic	Original Scale	Log Scale
Mean:	13.000	2.555
Std Dev:	2.236	0.156
Skewness:	1.500*	1.500*
Kurtosis:	0.250	0.250
Minimum:	12.000	2.485
Maximum:	17.000	2.833
CV:	0.172	0.061

Shapiro-Wilk Statistics

Scale	Test Statistic	5% Critical Value	1% Critical Value
Original:	0.5521*	0.7620	0.6860

Log:	0.5521*	0.7620	0.6860

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

Nonparametric Prediction Interval
Report Printed February 2,2005

Facility:Haz. Waste Unit 16 - RAAP
Parameter:Dimethyl ether(CAS Number:- -)

ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL

Observations (n):	5
Conf. Level (1-α):	33.330%

UL: 17.000 ppb
LL: 0.000

Report Produced by GRITS/STAT 5.01

Normality Tests

Report Printed: 02-02-2005 13:54

Facility:RAAPHWMU16 Haz. Waste Unit 16 - RAAP

Address:

City:Radford ST:VA Zip:24141
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:MeCl Dichloromethane (Methylene chloride)

CAS Number: 75-09-2
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 2.000 ppb

Start Date:Mar 31 1996
End Date:Dec 22 1999

Normality Test on Observations for wells listed below:

Well:16C1 Position:Upgradient Observations:5

Scale	Minimum	Maximum	Mean	Std Dev
Original:	4.100	6.800	5.800	1.037
Log:	1.411	1.917	1.743	0.197

Pooled Statistics
Observations: 5

Statistic	Original Scale	Log Scale
Mean:	5.800	1.743
Std Dev:	1.037	0.197
Skewness:	-0.925	-1.088*
Kurtosis:	-0.436	-0.263
Minimum:	4.100	1.411
Maximum:	6.800	1.917
CV:	0.179	0.113

Shapiro-Wilk Statistics

Scale	Test Statistic	5% Critical Value	1% Critical Value
Original:	0.8964	0.7620	0.6860

Log:	0.8519	0.7620	0.6860

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

Parametric Prediction Interval
Report Printed February 2,2005

Facility:Haz. Waste Unit 16 - RAAP
Parameter:Dichloromethane (Methylene chloride(CAS Number:75-09-2)

ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL

Observations (n):	5
Shapiro-Wilk (W):	0.8964
Critical W, α=0.01:	0.6860
Mean:	5.800 ppb
Std Dev:	1.037 ppb
DF:	4
Conf. Level (1-α):	~~0.9500~~ 0.99
Future Samples (k):	10
$t_{\left[\frac{1-\alpha}{k}\right]}$:	7.1732
Kappa:	7.8579
UL:	13.947 ppb
LL:	$-\infty$

Report Produced by GRITS/STAT 5.01

Target Analyte Monitoring Results - HWMU-16 Point of Compliance Wells
Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 16C1 ***All Results in ug/L.***

Analtye/Quarter	*16C1*	*16MW8*	*16MW9*	*16WC1A*	*16WC1B*	*QL*	*GPS*	*Method*
Chloroethane					*CAS #*	*75-00-3*		
Third Quarter 2003	6.4	U	4.8	U	U	1	20.7	8260B
Fourth Quarter 2003	5.7	U	2.6	1.1	U	1	20.7	8260B
First Quarter 2004	U J	U J	U J	U J	U J	1	20.7	8260B
Second Quarter 2004	4.4	U	2.4	0.63 J	U	1	20.7	8260B
Third Quarter 2004	4.2	U	2	U	U	1	20.7	8260B
Fourth Quarter 2004	4.9	U	2.5	U	U	1	20.7	8260B
First Quarter 2005	7.6 J	U J	3.7 J	U J	U J	1	20.7	8260B
Second Quarter 2005	U J	U	U J	U	U	1	20.7	8260B
Third Quarter 2005	4.7 J	U J	U	U J	U J	1	20.7	8260B
Fourth Quarter 2005	4.6 J	U	2.6 J	U	U	1	20.7	8260B
First Quarter 2006	5.3	U	U	U	U	1	20.7	8260B
Second Quarter 2006	5 J	U	2 J	U	U	1	20.7	8260B
Third Quarter 2006	5	U	0.7 J	0.7 J	U	1	20.7	8260B
Fourth Quarter 2006	5.8	U	1	U	U	1	20.7	8260B
First Quarter 2007	6.1	U	1	U	U	1	20.7	8260B
Second Quarter 2007	5.2	U	1.4	U	U	1	20.7	8260B
Diethyl ether					*CAS #*	*60-29-7*		
Third Quarter 2003	12 J	U	12 J	U	U	12	-	8260B
Fourth Quarter 2003	30	U	14	U	U	12	-	8260B
First Quarter 2004	24	U	U	U	U	12	-	8260B
Second Quarter 2004	23 J	U J	13 J	U J	U J	12	-	8260B
Third Quarter 2004	17	U	U	U	U	12	-	8260B
Fourth Quarter 2004	24	U J	U	U	U J	12	-	8260B
First Quarter 2005	29	U	14	U	U	12	-	8260B
Second Quarter 2005	20	U J	9.2	U J	U J	12	-	8260B
Third Quarter 2005	30	U	15	U	U	12	-	8260B
Fourth Quarter 2005	25	U	18	U	U	12	-	8260B
First Quarter 2006	19	U	U	U	U	12	-	8260B
Second Quarter 2006	17	U	U	U	U	12.5	-	8260B
Third Quarter 2006	33	1.5 J	4.3 J	4.6 J	U	12.5	-	8260B
Fourth Quarter 2006	20	U	U	U	U	12.5	-	8260B
First Quarter 2007	21	U	U	U	U	12.5	-	8260B
Second Quarter 2007	17 J	1.5 J	5.7 J	2.1 J	U J	12.5	-	8260B
Dimethyl ether					*CAS #*	*115-10-6*		
Third Quarter 2003	6.6 J	U	9.9 J	U	U	12	-	8260B
Fourth Quarter 2003	U	U	U	U	U	12	-	8260B
First Quarter 2004	17 J	U J	13 J	U J	U J	12	-	8260B
Second Quarter 2004	U J	U J	6.6 J	U J	U J	12	-	8260B
Third Quarter 2004	U J	U J	U J	U J	U J	12	-	8260B
Fourth Quarter 2004	16 J	U J	12 J	U	U J	12	-	8260B
First Quarter 2005	26	U	25	U	U	12	-	8260B
Second Quarter 2005	15	U	14	U	U	12	-	8260B
Third Quarter 2005	13	U	U	U	U	12	-	8260B
Fourth Quarter 2005	U	U	U	U	U	12	-	8260B
First Quarter 2006	U	U	U	U	U	12	-	8260B
Second Quarter 2006	U	U	U	U	U	12.5	-	8260B
Third Quarter 2006	11 J	U J	3.2 J	2.8 J	U J	12.5	-	8260B
Fourth Quarter 2006	U	U	U	U	U	12.5	-	8260B
First Quarter 2007	U	U	U	U	U	12.5	-	8260B
Second Quarter 2007	11 J	U	7 J	2.6 J	1.2 J	12.5	-	8260B

See last page of this report for definitions.

Target Analyte Monitoring Results - HWMU-16 Point of Compliance Wells
Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 16C1 *All Results in ug/L.*

Analtye/Quarter	16C1	16MW8	16MW9	16WC1A	16WC1B	QL	GPS	Method
Methylene chloride					CAS # 75-09-2			
Third Quarter 2003	4.1	U	U	U	U	1	13.95	8260B
Fourth Quarter 2003	6.8	U	U	U	U	1	13.95	8260B
First Quarter 2004	6.4	U	U	U	U	1	13.95	8260B
Second Quarter 2004	5.7	U	U	U	U	1	13.95	8260B
Third Quarter 2004	6	U A	U A	U A	U A	1	13.95	8260B
Fourth Quarter 2004	6.4	U	U	U	U	1	13.95	8260B
First Quarter 2005	6.8 J	U	U	U	U	1	13.95	8260B
Second Quarter 2005	6.3	U	U	U	U	1	13.95	8260B
Third Quarter 2005	6.2	U	U	U	U	1	13.95	8260B
Fourth Quarter 2005	4.7	U	U	U	U	1	13.95	8260B
First Quarter 2006	4.9	U	U	U	U	1	13.95	8260B
Second Quarter 2006	7	U	U	U	U	1	13.95	8260B
Third Quarter 2006	U N	U N	U N	U N	U N	1	13.95	8260B
Fourth Quarter 2006	U A	U	U	U A	U	1	13.95	8260B
First Quarter 2007	6.3	U	U	U	U	1	13.95	8260B
Second Quarter 2007	3.4	U	U	U	U	1	13.95	8260B
1,1,2-Trichloro-1,2,2-Trifluoroethane					CAS # 76-13-1			
Third Quarter 2003	U	U	U	U	U	1	-	8260B
Second Quarter 2004	1.2	U J	U J	U J	U J	1	-	8260B
Third Quarter 2004	U	U	U	U	U	1	-	8260B
Fourth Quarter 2004	U	U	U	U	U	1	-	8260B
First Quarter 2005	1	U	U	U	U	1	-	8260B
Second Quarter 2005	U	U	U	U	U	1	-	8260B
Third Quarter 2005	U	U	U	U	U	1	-	8260B
Fourth Quarter 2005	U	U	U	U	U	1	-	8260B
First Quarter 2006	U	U	U	U	U	1	-	8260B
Second Quarter 2006	U	U	U	U	U	1	-	8260B
Third Quarter 2006	U	U	U	U	U	1	-	8260B
Fourth Quarter 2006	U	U	U	U	U	1	-	8260B
First Quarter 2007	U	U	U	U	U	1	-	8260B
Second Quarter 2007	U	U	U	U	U	1	-	8260B

See last page of this report for definitions.

Target Analyte Monitoring Results - HWMU-16 Point of Compliance Wells
Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 16C1 ***All Results in ug/L.***

Analtye/Quarter	*16C1*	*16MW8*	*16MW9*	*16WC1A*	*16WC1B*	*QL*	*GPS*	*Method*

Definitions: QL Denotes permit required quantitation limit. **U** Denotes analyte not detected at or above QL. **UA** Denotes analyte not detected at or above adjusted sample QL. **J** Denotes associated result is estimated. When used with "U" (i.e., "**UJ**"), denotes analyte not detected at or above QL and QL is estimated. When used with "UA" (i.e., "**UAJ**"), denotes analyte not detected at or above adjusted QL and adjusted QL is estimated. **UN** Denotes analyte concentration is less than the quantiation limit and five times the blank concentration. Not reliably detected due to blank contamination. This qualifier used only for Appendix IX monitoring event when results are reported to at or above the project detection limit. **R** Denotes result rejected. **Q** Denotes data validation qualifier. **CAS#** Denotes Chemical Abstract Services registration number. **X** Denotes mass spectral confirmation not obtained-result suspect.

GPS Denotes Groundwater Protection Standards listed in Appendix G to Attachment 5 in the Final Hazardous Waste Post-Closure Care Permit for Hazardous Waste Units 5, 7, 10, and 16 (October 4, 2002).
NS denotes not sampled. **NA** denotes not analyzed. "–" denotes not detected (pre-2nd Quarter 2003) or not available / not sampled (beginning 2nd Quarter 2003).

Notes:
-Appendix IX Groundwater Monitoring Events:
Third Quarter 2003, Second Quarter 2004, Second Quarter 2005, Third Quarter 2006, Second Quarter 2007
For Appendix IX monitoring events, all results evaluated to detection limit. See laboratory data deliverable for detection limit.

-9/30/2003: Verification sampling event for 16C1 (heptachlor) and 16C1B (Endrin). Verification results: all results reported not detected to detection limit. Original results 0.067 µg/l and 0.39 µg/l, respectively. Confirmation results reported in this table.
-9/30/2003: Verification sampling event for 16C1 (chloroethane, ethyl ether, methyl ether, methylene chloride) and 16MW9 (chloroethane, ethyl ether, methyl ether). Verification results: all results confirmed original analysis. Original results reported in this table.
-June 21, 2004: Verification event for 8260B 16C1 (1,1-dichloroethene and 1,1,2-trichloro-1,2,2-trifluoroethane). Verification results: all not detected except 1,1,2-trichloro-1,2,2-trifluoroethane added to quarterly analyte list beginning 3Q 2004. Due to laboratory error, Appendix IX results for semivolatiles (Method 8270C) will be presented in 3Q 2004. Verification event results for 16WC1B and 16C1 (8081A) -- all verification results were not confirmed.
-07/27-28/2005. Verification event for 16WC1B (Mercury Method 7470A.) Not detected in verification sample. Also, verification event for 16C1, 16WC1B-8081A. and 16C1, 16MW9, 16WC1A-ethanol. All verification results not detected. Verification results used.
-06/19/2007. Verification event for 16WC1B and 16MW9 thallium Not detected in verification sample. Verification results used.

Ross Miller

From: Flint, Jeremy <Jeremy.Flint@ATK.COM>
Sent: Friday, January 20, 2012 2:23 PM
To: Powers, Loretta
Cc: Janet Frazier; Kathy Olsen; Mike Lawless; Ross Miller
Subject: FW: VA1210020730, RAAP, Additional App. IX GW Mont Results PCC HWMU 5,7,10,16, Final Notification

Loretta,
Please file the attached e-mail as an answer to ATK letter number 11-815-106

Thank You
Jeremy Flint
Lead Compliance Engineer
Environmental Affairs Department
Alliant Techsystems Inc.
P.O. Box 1
Radford, VA 24143
Phone: 540 - 639 - 7668
Fax: 540 - 639 - 8109
"Together Everyone Accomplishes More." (TEAM)

From: Maiden, Vince (DEQ) [mailto:Vincent.Maiden@deq.virginia.gov]
Sent: Friday, January 20, 2012 10:26 AM
To: Flint, Jeremy
Cc: McKenna, Jim; Schneider, Jutta (DEQ)
Subject: VA1210020730, RAAP, Additional App. IX GW Mont Results PCC HWMU 5,7,10,16, Final Notification

Jeremy:

The Department has received the referenced August 1, 2011 document. The notification indicates the benzene was confirmed in 16MW and recommended that this contituent be added to the compliance monitoring list for HWMU-16. In addition, the facility recommeded that the background for benzene be estalished at the LOQ of 1µg/l and the groundwater protection standard be set at 5µg/l based on the MCL. The Department agrees with the recommedations. It appears that these changes were included in the permit renewal application dated September 15, 2011. The Department will formally address those changes along with others in the permit renewal process. If you have any questions please feel free to contact me.

Vincent Maiden
Corrective Action Project Manager
Virginia Department of Environmental Quality
Office of Remediation Programs
629 East Main Street or P.O. Box 1105
Richmond, VA 23218 Richmond, VA 23219
(276) 676-4867
Vincent.Maiden@deq.virginia.gov

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Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

Office of Waste Permitting and Compliance

Land Protection and Remediation Division

September 12, 2014

VIA ELECTRONIC MAIL
Mr. Jay Stewart
Environmental Manager
BAE Systems, Ordnance Systems, Inc.
Radford Army Ammunition Plant
4050 Pepper's Ferry Road
Radford, Virginia 24141

Re: Radford Army Ammunition Plant, Radford, VA
EPA ID No.VA1210020730, Approval of Class 1 Permit Modifications
Hazardous Waste Management Units 5 and 16, Post Closure-Care Permit

Dear Mr. Stewart:

Enclosed are the final Class 1 Modifications to the Hazardous Waste Permit for Post Closure-Care of two hazardous waste management units (HWMUs) 5 and 16 at the Radford Army Ammunition Plant (RAAP), Radford, Virginia facility. The final Class 1 Modifications to the Permit have been approved.

The Virginia Department of Environmental Quality (DEQ) received the Class 1 Permit groundwater related modification request addressing the HWMU 16 that was communicated to the DEQ in an e-mail dated August 13, 2014, from the RAAP, Radford, Virginia facility. RAAP requested that 1,1-dichloroethene (1,1-DCE) be added to the Groundwater Compliance Monitoring Constituent List for HWMU-16.

1,1-DCE was detected in the most recent annual groundwater sampling event required under the Post-Closure Permit, and in a letter dated July 21, 2014, the VDEQ supported the RAAP's July 1, 2014, proposal that 1,1-DCE be added to the Groundwater Compliance Monitoring Constituent List and also the setting of the background value for 1,1-DCE at the Limit of Quantitation (LOQ) value of 1

ug/1 and the Groundwater Protection Standard (GPS) at the USEPA Maximum Contaminant Level (MCL) of 7 ug/l.

In the e-mail letter dated August 13, 2014, RAAP submitted the following requested changes to the facility's hazardous waste Post Closure-Care Permit as marked–up files comprising the Class 1 Permit modification:

- Permit Attachment 3, Appendix E (HWMU-16 Groundwater Compliance Monitoring Constituent List) from the Post-Closure Care Permit to add 1,1-DCE to the groundwater Compliance Monitoring Program for HWMU-16, and

- Permit Attachment 3, Appendix G (HWMU-16 Groundwater Protection Standards) from the Post-Closure Care Permit to add 1,1-DCE to the groundwater Compliance Monitoring Program for HWMU-16.

The requested changes represent a Class 1 permit modification under 40 CFR § 270.42, Appendix I.C.2 – *Changes in groundwater sampling or analysis procedures or monitoring schedule, with prior approval of the Director.*

Based on the above justification, this August 13, 2014, e-mailed letter requesting changes in the groundwater compliance monitoring program including the addition of 1,1-DCE and its associated background concentration and GPS; the RAAP has established sufficient documentation for approval of all requested changes. In accordance with the VHWMR, under 40 CFR § 270.42, Appendix I, Section C.2 and based upon the accuracy of the information contained in the Permittee's correspondence dated August 13, 2014, the requested Class 1 modifications to the permit are approved.

Enclosed are the final modified pages in electronic format to be inserted into the RAAP's copy of the hazardous waste permit.

All conditions and requirements of the facility Permit shall remain in effect for the duration of the Permit unless the existing Permit is modified, revoked and reissued, or terminated in accordance with 40 CFR § 124.5, and 40 CFR § 270.41 through 270.42, or continued in accordance with 9 VAC 20-60-270.B.5.

As provided by Rule 2A:2 of the Supreme Court of Virginia, you have 30 days from the date of service of this decision to initiate a legal appeal by filing a notice of appeal with:

David K. Paylor, Director
Department of Environmental Quality
629 East Main Street
P.O. Box 1105
Richmond, VA 23218

In the event that this decision is served to you by mail, the date of service will be calculated as three days after the postmark date. Please refer to Part 2A of the Rules of the Supreme Court of Virginia, which describes the required content of the Notice of Appeal, including specifications

of the Circuit Court to which the appeal is taken, and additional requirements concerning appeals from decisions of administrative agencies.

This above Class 1 permit modification under 40 CFR § 270.42(a)(1) requires the Permittee to send a notice of the modification to all persons on the facility mailing list (attached) within 90 days after the change is put into effect. In addition, RAAP must provide documentation to this Office regarding compliance with the public notice requirement. Please submit evidence of this mailing (return receipts, copy of the notification letter) when it is available.

If you should have any questions regarding these matters, please contact Russell McAvoy, Jr., PE, Environmental Engineer Senior, at (804) 698-4194 or by e-mail at russell.mcavoy@deq.virginia.gov.

Sincerely,

Leslie A. Romanchik

Leslie A. Romanchik
Hazardous Waste Program Manager
Office of Waste Permitting and Compliance

Enclosures: Facility Mailing List, Modified Permit Pages

cc: Andrea Barbieri – EPA, Region III (3LC50) e/enclosures
Jutta Schneider – DEQ, CO
Kurt Kochan – DEQ, CO
Aziz Farahmand – DEQ, BRRO
Elizabeth Lohman – DEQ, BRRO
Julia King–Collins – DEQ, CO
Central Hazardous Waste Files

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Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4020
1-800-592-5482

July 19, 2016

Mr. Jay Stewart
Environmental Manager
BAE Systems, Ordnance Systems Inc.
4050 Pepper's Ferry Road
Radford, Virginia 24141

VIA ELECTRONIC MAIL

Re: Annual Corrective Action Groundwater Monitoring Event Notification - HWMU-5
Semiannual Detection Notification – HWMU-16
Notification of Groundwater Verification Sampling Results for Post Closure Care Permit HWMUs 5 & 16
Radford Army Ammunitions Plant
Route 114, Radford, Virginia 24141
EPA ID#: VA1210020730

Dear Mr. Stewart:

This letter acknowledges the receipt and review of the Annual Corrective Action Groundwater Monitoring Event - HWMU-5, Semiannual Detection Notification – HWMU-16 dated June 14, 2016, and Notification of Groundwater Verification Sampling Results for Post Closure Care Permit HWMUs 5 & 16 dated June 5, 2015, submitted to the Virginia Department of Environmental Quality, Office of Remediation Programs (Department) by BAE Systems on behalf of the Radford Army Ammunitions Plant (RFAAP).

It appears that no new targeted constituents were detected during the groundwater monitoring activities conducted during the Second Quarter of 2016 for HWMUs 5. However, total cobalt was detected in Point of Compliance (POC) monitoring wells 16WC1B and 16WC9 at concentrations of 35 micrograms per liter (ug/L) and 5.5 ug/L, respectively. These concentrations are greater than the Groundwater Protection Standard (GPS) of 5 ug/L for total cobalt for this unit. RAAP had previously submitted an Alternate Source Demonstration (ASD) to the Department indicating that the detections of cobalt in this well were due to natural variation. As the report points out, the Department requested a minimum of one year of additional monitoring of this well prior to making a decision on this ASD request. Further, tetrahydrofuran and cyanide were detected in POC monitoring well 16WC8 and tetrahydrofuran, vinyl chloride, and cyanide were detected in POC monitoring well 16WC1A.

Tetrahydrofuran was detected in the verification sample from 16WC1A at an estimated concentration of 2.2 ug/l, which is greater than the detection limit of 2.0 ug/1; therefore, the original estimated tetrahydrofuran concentration of 4.6 ug/1was confirmed. A Class 1 Permit Modification to add tetrahyrofuran to the Groundwater Compliance Monitoring List for the Unit is required. The Department concurs with RFAAP that the background value for tetrahydrofuran is the permit specified QL of 25 ug/l and that the Groundwater Protection Standard (GPS) be the May 2016 USEPA Regional Screening Level (RSL) of 3,400 ug/l since there is no USEPA Maximum Contaminant Level (MCL) or VDEQ Alternate Concentration Limit (ACL) for tetrahydrofuran.

On June 16, 2016, verification samples were collected from HWMU-16 POC monitoring well 16MW9 to confirm or refute the initial sampling results of cobalt at concentrations greater than the unit specific GPS of 5 ug/L. Total cobalt was detected at concentrations greater than the GPS during the verification sampling. The Department understands that for confirmation, a split sample and split sample duplicate were collected and sent to different laboratories to verify the initial detection. The sample and sample duplicate result concentrations from Test America, the primary laboratory, were 4.7 ug/1 and 4.8 ug/l, respectively, which are less than the GPS of 5 ug/1. The split sample and split sample duplicate result concentrations from Eurofins were 5.6 ug/l and 6.0 ug/l, respectively, which are greater than the GPS of 5 ug/l. The Department respectfully disagrees with the Facility and considers this a confirmed detection.

RFAAP should continue to collect data as previously discussed for the Alternate Source Demonstration (ASD) for the cobalt detected above the applicable Groundwater Protection Standard in point of compliance well 16WC1B at HWMU-16 and now 16MW9.

As previously discussed, the Department acknowledges the presence of barium above the site-specific background concentration. The Department recognizes the variability of the lithology in the area of HWMU-16 that could potentially account for the natural variation of this trace element. No further investigation is required at this time; however, the Department may request further investigation if the barium levels in groundwater increase in the future.

If you have any additional technical questions, you may contact me at 703-583-3825 or by email at Kurt.Kochan@deq.virginia.gov.

Sincerely,

Kurt W. Kochan
Corrective Action Project Manager
Office of Remediation Programs

cc: RFAAP Correspondence File
Brett Fisher, VDEQ-CO
Russ McAvoy, VDEQ-CO
Cassie McGoldrick, EPA Region 3
Jim McKenna, ACO Staff
Matt Albers, BAE
Aziz Farahmand, VDEQ-BRRO
Mike Lawless, DAA

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Matthew J. Strickler
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

May 3, 2021

Mr. Jim McKenna
Radford Army Ammunition Plant
Route 114, P.O. Box 1
Radford, Virginia 24143-0100

VIA ELECTRONIC MAIL

Re: 2020 Annual Groundwater Monitoring Report for Hazardous Waste Management Units 5 & 16 Radford Army Ammunitions Plant Route 114, Radford, Virginia 24141 EPA ID#: VA1210020730

Dear Mr. McKenna:

This letter acknowledges the receipt and review of the 2020 Annual Groundwater Monitoring Report for Hazardous Waste Management Units (HWMU) 5 & 16 dated February 2021, submitted to the Virginia Department of Environmental Quality (Department or DEQ), Office of Remediation Programs (ORP) by BAE Systems on behalf of the Radford Army Ammunitions Plant (RFAAP).

There were reportedly no new-targeted constituents detected during the groundwater monitoring activities conducted during the second or fourth quarters of 2020 for HWMU-5. However, total cobalt, a potentially newly detected constituent, continues to be detected at concentrations greater than the groundwater protection standard (GPS) and alternate concentration limit (ACL) in several monitoring wells at HWMU-16. The Department requested a revised Alternate Source Demonstration (ASD) for cobalt in December 2020. The revised ASD should be submitted as soon as practicable.

Further, the presence of vinyl chloride was verified in 16WC1A at HWMU-16. The Department concurs with the recommendations to utilize a background value of 1 ug/L based on permit specified QL as the constituent has not previously been detected at the unit and a GPS of 2 ug/L based on the USEPA MCL for vinyl chloride.

As previously noted, the Department acknowledges the presence of barium above the site-specific background concentration. The Department recognizes that the variability of the lithology in the area of HWMU-16 could potentially explain the variation of this element. No further investigation is required at this time; however, the Department may request further investigation if the barium levels in groundwater increase in the future.

The Department accepts the report as complete. However, the Department does want to acknowledge that several constituents were reported above the permit specified detection limits. The Department does not require any action at this time as this issue is being addressed by a Class 1 permit modification that is currently under review by DEQ.

If you have any questions regarding this correspondence, you may contact me at 703-583-3825 or by email at Kurt.Kochan@deq.virginia.gov.

Sincerely,

Kurt W. Kochan
Project Manager

cc: RFAAP Correspondence File
Tara Mason, Ashby Scott, DEQ-CO
Nikki Herschler, DEQ-BRRO
Melissa Lincoln, Jody Hawks, BAE
Mike Lawless, DAA

Table 3: Indicator Parameter Data for Monitoring Wells.

Radford Army Ammunition Plant (RFAAP) - Hazardous Waste Management Unit #16

Radford, Virginia

Indicator Parameter	*Unit*	*16C1*	*16MW8*	*16MW9*	*16WC1A*	*16WC1B*	*16WC2B*	*16-2*	*16-3*	*16-5*
Second Quarter 2023										
Dissolved Oxygen (DO)	mg/L	0.51	0.23	0.33	0.4	5.38	0.63	6.04	6.36	0.97
Oxidation Reduction Potential (ORP)	mV	15	250	-16	-42	256	202	201	199	219
pH	s.u.	6.54	5.14	6.62	6.67	6.44	7.88	7.06	7.85	7.19
Specific Conductivity	uS/cm	710.5	135.5	927.6	793.5	376.7	306.6	602.3	235.2	522
Temperature	degs C	14.2	13.9	13.9	13.6	13.7	13.9	13.4	13.6	12.8
Turbidity	NTU	0.9	1.19	3.25	0.77	14.8	0.65	1.5	5.24	2.2
Third Quarter 2023										
Dissolved Oxygen (DO)	mg/L	0.6	2.69	0.54	0.38	5.63	2.92	5.64	5.31	3.41
Oxidation Reduction Potential (ORP)	mV	44	202	-21	-33	147	190	176	131	210
pH	s.u.	6.37	5.11	6.53	6.57	6.47	7.55	6.96	7.3	6.88
Specific Conductivity	uS/cm	677	152	936.6	836.8	406.5	316.8	600.2	242	533.6
Temperature	degs C	15.4	17	15.2	14.5	15.5	15	14.3	15.3	13.2
Turbidity	NTU	0.79	3.06	1.72	0.96	36.3	0.95	1.59	2.74	4.18

APPENDIX C
LABORATORY ANALYTICAL RESULTS – YEAR 2023

APPENDIX D

FIELD NOTES

5/10/23 RFAAP: UNIT-5 / ~~017683~~ / RFC-ABP 547076 5/9/23

General Notes: (UNIT-5)

- Weather: Foggy early then clear: 50°-70°'s
- PPE: Nitrile gloves, eye protection & safety boots
- Calibrations: YSI Pro Plus / D.O. % = 95.1 %

pH: 4.00 - 4.00, 7.00 - 7.00, 10.00 - 10.00

Conductivity reads 1413 µS/cm in a 1413 µS/cm stnd.

HACH 2100Q Turbidimeter: 0.02-1000 NTU

- Dedicated well skirts & tubing used at each well.
- All equipment deconned before & after event and between use at each sample location.
- All purge water collected & disposed of at a dedicated, on-site location.
- All samples collected, transported & shipped on ice coolers.
- Sample collection order: 8260D, TM & 8270D.
- All wells purged and sampled at 0.25 L/min.
- All DTW's collected in feet.

Sample Analysis	Preservative
8260D	HCL
TOTAL METALS	HNO_3
8270D	N/A

- VOA's collected from one pulse from bladder pump.
- Bladder pump settings @ 4 cycles/min. 5 SEC DISCHARGE, 10 SEC RECHARGE

STATIC WATER LEVEL TABLE (UNIT-5)

WELL	DTW	P/PURGE DTW	NOTES	WELL	DTW	P/PURGE DTW	NOTES
SW8B	13.66	14.03	Pad ok	SWCA	12.13	N/A	PAD-OK
SW12A	10.21	10.23	Pad ok, no signage	SW10A	12.34		
SW7B	8.04	8.07	Pad ok, sign not attached	SWC11	14.39		
SW5B	8.32	8.44	Pad ok, sign not attached.	SWC12	12.85		
SWC21	8.02	8.04	PAD OK	SSW5	6.94		Pad ok
SWC22	8.00	8.04	PAD OK	SSW6	5.35		"
SWC23	7.43	7.44	PAD OK	SSW7	10.46		Pad ok
SWL'S ONLY				SSW8	11.21		"
SW9A	0.48	N/A	Pad ok	SW11A	9.76		"

5/10/23 UNIT-5: RFAAP (017683) / KFC-ABP F.B. #15

CONFIDENCE SOLUTION VALUE RANGE

BATCH #: 2261C DATE OPENED: 4/25/23

	TEMP (°C)		COND (mS/cm)		ORP (mV)		pH	
	ACTUAL	RANGE	ACTUAL	RANGE	ACTUAL	RANGE	Actual	Range
~~PRE~~	~~15.2~~	~~11-20~~	~~7802~~	~~7630-7970~~	~~253~~	~~222-252~~	~~6.99~~	~~6.8-7.2~~
POST-	19.8	16-20	7916	7630-7970	225	222-252	7.01	6.8-7.2
PRE-	15.2	11-15	7802	7600-7970	253	229-261	6.99	6.8-7.2

SW8B: CB:23

DTW: 13.66 / POST PURGE DTW- 14.03 / Begin Purge (0729) / Initial Purge- CLEAR

TIME	TEMP (°C)	Cond (mS/cm)	DO (mg/L)	pH	ORP (mV)	TURB (NTU)	DTW	Desc.
(0730)	13.5	61.07	5.85	5.52	282	3.07	14.07	clear
(0735)	13.4	59.41	5.20	4.78	303	3.32	14.01	clear
(0740)	13.3	59.21	5.13	4.75	306	3.48	14.00	clear
(0745)	13.3	59.04	5.02	4.72	307	3.18	14.00	clear
(0750)	13.3	59.27	5.03	4.62	312	2.35	14.01	clear
(0755)	13.4	58.85	5.05	4.66	310	3.55	14.02	clear

(0755) Reading's stable

Sample Time (0800) / SAMPLES COLLECTED: (3) 82600 & (1) TM

(0802)	13.4	58.96	4.87	4.68	310	2.70	14.03	clear

5/23
pH
ctral/Range
~~99/6.8-7.2~~
01/6.8-7.2
99/6.8-7.2

CLEAR
Desc.
clear
clear
clear
clear
clear
clear

clear

SW12A: CB: 25

DTW: 10.21 / Post Purge DTW: 10.23 / Begin Purge (0813) / Initial Purge - clear

TIME	Temp (°C)	Cond mS/cm	DO mg/L	pH	ORP (mV)	Turb (NTU)	DTW	Desc.
(0814)	13.5	506.9	3.12	6.16	277	1.38	10.22	clear
(0819)	13.6	503.1	2.27	6.59	276	2.77	10.23	clear
(0824)	13.6	500.4	1.75	6.67	278	2.70	10.23	clear
(0829)	13.6	500.5	1.57	6.70	280	2.54	10.23	clear
(0834)	13.7	500.1	1.48	6.68	280	2.44	10.23	clear
(0839)	13.7	500.2	1.47	6.69	281	2.00	10.23	clear
(0839) Readings Stable								
Sample Time (0840) / Samples collected: (3) 8260D, (1) TM								
(0844)	13.7	499.9	1.69	6.73	279	2.35	10.23	clear

SW7B: CB: 22

DTW: 8.04 / Post Purge DTW: 8.07 / Begin Purge (0854) / Initial Purge - clear

TIME	Temp (°C)	Cond mS/cm	DO mg/L	pH	ORP (mV)	Turb (NTU)	DTW	Desc.
(0855)	12.2	185.8	5.76	6.23	291	1.38	8.08	clear
(0900)	12.1	167.2	5.87	5.37	300	0.75	8.08	clear
(0905)	12.4	161.2	5.96	5.07	303	1.08	8.04	clear
(0910)	12.6	161.2	5.87	5.05	299	1.75	8.04	clear
(0915)	12.7	160.5	5.66	5.05	293	1.80	8.04	clear
(0920)	12.8	160.5	5.66	5.10	287	1.89	8.06	clear
(0920) Readings Stable								
Sample Time (0925) / Samples collected: (ABP 5-10-23) ~~2~~(9) 8260D, (6) 8270D, (3) TM								
(0938)	13.3	162.3	5.62	5.15	273	1.84	8.07	clear

5/10/23 RFAAP: UNIT-5 / 017683 / KFC-ABP F.B#15

SW5B CB: 19

DTW: 8.32 / Post Purge DTW: 8.44 / Begin Purge (0952) / Initial Purge - clear

TIME	TEMP (C)	Cond mS/cm	DO mg/L	pH	ORP (mV)	TURB (NTU)	DTW	Desc.
(0953)	13.1	320.0	4.61	5.29	276	3.00	8.32	clear
(0958)	12.9	324.5	1.99	5.34	272	1.32	8.29	clear
(1003)	12.6	324.1	2.02	5.41	273	1.32	8.31	clear
(1008)	12.6	324.9	1.65	5.45	271	1.06	8.29	clear
(1013)	12.7	324.6	1.55	5.38	272	1.17	8.29	clear
(1018)	12.8	325.0	1.55	5.42	273	0.72	8.39	clear
(1018)	Readings Stable							

Sample Time (1020) / Samples Collected: (3) 8260D, (2) 8270D, (1) TM

(1025)	12.9	324.5	1.65	5.39	271	0.77	8.44	clear

SWC22: CB: 20

DTW: 8.00 / Post Purge DTW: 8.04 / Begin Purge (1054) / Initial Purge - CLEAR

TIME	TEMP (C)	Cond mS/cm	DO mg/L	pH	ORP (mV)	TURB (NTU)	DTW	DESC.
(1055 ~~1023~~)	15.9	827.1	3.15	6.51	223	0.91	8.05	Clear
(1100 ~~1028~~)	14.3	886.7	1.25	6.75	207	27.4	8.04	slightly cloudy
(1105 ~~1033~~)	14.4	891.4	0.90	6.84	206	18.6	8.05	Sl. cloudy w/ sus. black particles.
(1110 ~~1038~~)	14.2	890.0	0.72	6.81	209	12.6	8.01	clear
(1115 ~~1043~~)	14.3	883.6	0.59	6.77	206	9.65	8.03	clear
(1120 ~~1048~~)	14.1	890.1	0.50	6.77	203	8.01	8.04	clear
(ABP 1120)	(5-1023) Readings Stable							

Sample Time (1125) / Samples Collected: (3) 8260D, (2) 8270D, (1) TM

(1129)	14.5	882.9	0.59	6.79	198	8.02	8.04	Clear

5WC23: CB: 30

DTW = 7.43 / Post Purge DTW = 7.44 / Begin Purge (1134) / Initial Purge - Clear

TIME	Temp (°C)	Cond (mS/cm)	DO (mg/L)	pH	ORP (mV)	Turb (NTU)	DTW	Desc.
(1135)	15.4	886.4	3.42	7.00	183	4.52	7.48	clear
(1140)	13.6	930.6	1.61	7.00	179	3.42	7.47	clear
(1145)	13.6	940.7	1.29	7.02	181	2.28	7.46	clear
(1150)	13.7	933.9	0.92	7.00	185	1.31	7.43	clear
(1155)	13.8	939.8	0.91	6.91	184	1.67	7.45	clear
(1200)	13.8	937.9	0.81	6.90	183	1.34	7.44	clear

(1200) Readings Stable

Sample Time (1205) / Samples Collected: (3)8260D, (2)8270D, (1)TM

(1208)	14.5	936.5	1.08	7.07	167	0.90	7.44	clear

5/12/23

5WC21: CB: 30

DTW = 8.02 / Post Purge DTW = 8.04 / Begin Purge (1214) / Initial Purge - Clear

TIME	TEMP (°C)	Cond (mS/cm)	DO (mg/L)	pH	ORP (mV)	Turb (NTU)	DTW	Desc.
(1215)	14.8	547.1	2.56	6.74	176	1.37	8.02	clear
(1220)	14.2	552.3	0.63	5.84	188	24.1	8.04	sl. cloudy
(1225)	14.1	530.5	0.37	5.68	192	33.1	8.03	sl. cloudy
(1230)	13.8	520.3	0.27	5.58	197	102	8.03	cloudy
(1235)	13.7	517.9	0.19	5.55	201	122	8.04	cloudy
(1240)	13.8	515.3	0.16	5.47	201	122	8.03	cloudy

(1240) Readings Stable

Sample Time (1245) / Samples Collected: (3)8260D, (2)8270D, (1)TM

(1300)	14.5	509.1	0.19	5.52	196	110	8.04	cloudy

5/12/23

5W~~C21~~ DUP - collected from 5WC21

Sample Time (1255) / Samples Collected: (3)8260D, (2)8270D, (1)TM

5/15/23 RFAAP (UNIT-16) / /KFC·ABP F.B.#15

GENERAL NOTES: (UNIT-16)

- Weather- Overcast, light rain & 60°s
- PPE- Nitrile gloves, eye protection & safety boots
- Calibrations- YSI Pro Plus / D.O.% = 95.8 %
  pH: 4.00 - 4.00, 7.00 - 7.00, 10.00 - 10.00
  Conductivity: Reads 1413 µS/cm in a 1413 µS/cm stnd.
  HACH 2100Q Turbidimeter: 0.02 - 1000 NTU
- Dedicated well skirts & tubing used at each well.
- All equipment deconned before & after event and between use at each sample location.
- All purge water collected & disposed of at a dedicated on-site location.
- All samples collected, transported & stored on ice in coolers.
- Sample collection order: 8260D, 8270D & TM.
- All wells purged & sampled at 0.25L/MIN.
- All DTW's measured in feet.

SAMPLE ANALYSIS	PRESERVATIVE	SAMPLE ANALYSIS	PRESERVATIVE
8260D	HCL	Total Metal	HNO_3
8270D	—		

- VOA's collected from one pulse from bladder pump.
- Bladder pump setting: 4 CYCLES/MIN: 5 SEC. DISCHARGE, 10 SEC. RECHARGE

STATIC WATER LEVEL TABLE (Measured in feet)

WELL	DTW	P/PURGE DTW	NOTES	WELL	DTW	P/PURGE DTW	NOTES
16-2-	55.82	55.88	Pad ok.	16MW9-	63.57	64.31	Pad OK
16-3-	56.14	63.51	Pad OK	16C1-	47.42	47.40	Pad OK
16-5-	4.00	10.14	Pad ok!	SWL'S ONLY			
16WC2B-	52.62	58.74	Pad ok!	16C3-	64.78	—	
16WC1B-	66.31	66.65	Pad ok.	16CDH3-	Dry @ 68.79	—	
16WC1A-	66.12	67.40	Pad OK	16WC2A-	Dry @ 62.21	—	
16MW8-	72.44	73.24	Pad ok.	16-1-	45.46	—	

5/15/23 RFAAP(UNIT-16)/ /KFC·ABP F.B.#15

CONFIDENCE SOLUTION VALUE RANGE

BATCH# 22G1C DATE OPENED: 4/25/23

	TEMP (°C)		COND (µS/cm)		ORP (mV)		pH	
	Actual	Range	Actual	Range	Actual	Range	Actual	Range
PRE:	18.1	16-20	7706	7630-7970	256	222-252	7.07	6.8-7.2
POST:	15.9	11-15	7611	7600-7970	228	229-261	6.96	6.8-7.2

16-5: CB-45

DTW: 4.00 / POST PURGE DTW: 10.14 / Begin Purge (0824) / Initial Purge - Clear

TIME	TEMP (°C)	COND (µS/cm)	DO (mg/L)	pH	ORP (mV)	TURB (NTU)	DTW	Desc.
(0825)	12.8	519.6	2.29	6.45	225	2.32	5.06	clear
(0830)	12.7	523.2	1.33	6.77	228	2.05	6.77	clear
(0835)	12.7	523.1	1.05	6.93	223	2.33	9.19	clear
(0840)	12.8	523.3	1.01	7.00	220	1.98	9.52	clear
(0845)	12.8	522.9	1.00	7.09	219	2.22	9.77	clear
(0850)	12.8	522.0	0.97	7.19	219	2.20	9.98	clear

(850) Preadings Stable

Sample Time (0855) / Samples Collected: (3) 8260D, (3) 8260C, (2) 8270D, (1) TM

(0858)	12.6	523.9	1.03	7.23	222	2.37	10.14	clear

16-SPRING:

TIME	TEMP (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	TURB (NTU)	Desc.
(0904)	13.0	573.5	6.99	7.58	217	3.69	clear

Sample Time (0905) (ABP 5-15-23)

Samples collected: (3) 8260D, (1) TM & (2) 8270D
(3) 8260C

5/15/23 RFAAP (UNIT-16) / RFC-ABP F.B.#15

16WC2B: CB: 50

DTW-52.62 / Post Purge DTW-58.74 / Begin Purge (0919) / Initial Purge - clear

TIME	Temp (°C)	Cond mS/cm	DO mg/L	pH	ORP (mV)	TURB (NTU)	DTW	Desc
(0920)	14.1	307.1	8.05	7.94	216	1.41	53.39	clear
(0925)	14.1	307.4	3.72	7.90	217	0.79	54.19	clear
(0930)	13.9	306.7	1.00	7.92	217	0.65	55.58	clear
(0935)	13.8	306.3	0.60	7.93	214	0.70	56.29	clear
(0940)	13.9	306.4	0.69	7.90	207	0.75	56.82	clear
(0945)	13.9	306.6	0.63	7.88	202	0.65	57.46	clear

(0945) Readings Stable / Sample Time (0950)

Samples collected: (3) 8260D, (3) 8260C, (2) 8270D, (1) TM

(0955)	13.9	306.8	0.79	7.86	182	0.67	58.74	clear

16-2: CB: 60

DTW-55.82 / Post Purge DTW-55.88 / Begin Purge (1004) / Initial Purge - clear

TIME	TEMP (°C)	Cond mS/cm	DO mg/L	pH	ORP (mV)	TURB (NTU)	DTW	Desc.
(1005)	13.4	565.4	7.91	7.47	200	0.78	55.83	clear
(1010)	13.4	607.3	6.09	7.26	197	2.78	55.85	clear
(1015)	13.6	609.0	5.79	7.10	197	1.59	55.85	clear
(1020)	13.6	609.3	5.97	7.11	198	1.44	55.85	clear
(1025)	13.5	607.9	5.99	7.04	201	1.27	55.86	clear
(1030)	13.4	602.3	6.04	7.06	201	1.50	55.87	clear

(1030) Reading Stable / Sample Time (1035)

Samples collected: (3) 8260D, (3) 8260C, (2) 8270D, (1) TM

(1040)	13.4	590.1	6.21	7.02	204	1.40	55.88	clear

16MW8: CB: 59

DTW: 72.44 / Post Purge DTW: 73.24 / Begin Purge: (1053) / Initial Purge - clear

TIME	TEMP (°C)	Cond mS/cm	DO mg/L	pH	ORP (mV)	Turb (NTU)	DTW	Desc.
(1054)	14.6	152.4	1.31	6.25	224	2.19	72.67	clear
(1059)	14.5	154.9	1.65	5.41	240	1.57	72.65	clear
(1104)	14.0	153.5	0.37	5.15	245	1.06	72.82	clear
(1109)	14.0	151.8	0.28	5.16	243	1.00	72.99	clear
(1114)	13.8	139.1	0.22	5.14	247	1.19	73.09	clear
(1119)	13.9	135.5	0.23	5.14	250		73.37	clear

(1119) Readings Stable / Sample Time (1120)

Samples Collected: (3) 8260D, (3) 8260C, (2) 8270D, (1) TM

(1126) 13.7 127.9 0.30 5.15 249 1.74 73.24 clear

16-3 CB: 50

DTW: 56.14 / Post Purge DTW: 63.51 / Begin Purge (1205) / Initial Purge - clear

TIME	TEMP (°C)	Cond mS/cm	DO mg/L	pH	ORP (mV)	Turb (NTU)	DTW	Desc.
(1205)	14.4	236.0	69.08	6.29	215	3.15	56.76	clear
(1210)	14.4	236.1	68.08	6.95	208	6.78	57.44	clear
(1215)	14.1	235.0	68.94	7.40	197	4.63	58.09	clear
(1220)	13.8	235.4	69.09	7.57	198	9.68	59.17	clear
(1225)	13.8	235.3	69.10	7.85	197	8.58	60.42	clear
(1230)	13.7	235.8	69.30	7.84	196	9.07	61.89	clear
(1235)	13.6	235.2	69.36	7.85	199	5.24	62.36	clear

AHBP 5-15-23

(1235) Readings Stable / Sample Time (1245)

Samples Collected: (3) 8260D, (3) 8260C, (2) 8270D, (1) TM

(1250) 13.7 233.6 6.21 7.81 203 3.57 63.51 clear

5/16/23 RFAAP (UNIT-16) / KFC-ABP F.B.#15

General Notes:

- Weather: Overcast, rainy & 60's
- PPE: Nitrile gloves, eye protection & safety boots
- Calibrations: YSI Pro Plus / D.O.% = 92.8 %

  pH: 4.00 = 4.00 7.00 = 7.00, 10.00 = 10.00

  Conductivity reads 1413 µS/cm in a 1413 µS/cm std.

  HACH 2100Q Turbidimeter: 0.02-1000 NTU
- Dedicated wellskirts & tubing used at each well.
- All equipment decomned before & after event and between use at each sample location.
- All purge water collected & disposed of at a dedicated, on-site location.
- All samples collected, transported & stored on ice in coolers.
- Sample collection order: 8260D, 8270D & T.M.
- All wells purged & sampled at 0.25L/MIN.
- All DTW's measured in feet.

Sample Analysis	Preservative	Sample Analysis	Preservative
8260D	HCL	Total Metals	HNO_3
8270D	—		

- VOAs collected from one pulse from bladder pump
- Bladder pump setting: 4 cycles/min: 5 sec Discharge, 10 sec. recharge

Confidence Solution Value Range

Batch #: 22G1C Date Opened: 4/25/23

	Temp (°C)		Cond µS/cm		ORP (mV)		pH	
	Actual	Range	Actual	Range	Actual	Range	Actual	Range
PRE-	15.9	11-15	7648	7600-9970	257	229-261	7.05	6.8-7.2
POST-								6.8-7.2

16WC1B: CB: 90

DTW: 66.19 / Post Purge DTW - 66.65 / Begin Purge (0819) / Initial Purge - Clear

TIME	TEMP (°C)	Cond (mS/cm)	DO (mg/L)	pH	ORP (mV)	Turb (NTU)	DTW	Desc.
0820	13.9	378.9	2.60	6.36	247	24.3	66.27	Clear
0825	14.0	379.8	2.55	6.38	249	8.04	66.34	Clear
0830	13.9	372.8	4.47	6.43	249	18.02	66.37	Clear
0835	13.8	376.7	5.18	6.43	251	22.9	66.41	Clear
0840	13.8	376.4	5.24	6.50	253	16.1	66.46	Clear
0845	13.7	374.7	5.38	6.44	256	14.8	66.51	Clear

(0845) Readings Stable / Sample Time (0850)

Samples Collected: (3) 8260D, (3) 8260C, (2) 8270D, (1) TM

(0855)	13.9	388.1	5.29	6.52	260	10.1	66.65	Clear

16WC1A: CB: 64

DTW: 66.00 / Post Purge DTW - 66.40 / Begin Purge (0904) / Initial Purge - Clear

TIME	TEMP (°C)	Cond (mS/cm)	DO (mg/L)	pH	ORP (mV)	Turb (NTU)	DTW	Desc.
0905	14.0	497.0	8.81	7.14	249	1.82	66.72	Clear
0910	13.4	715.1	0.83	7.15	253	2.28	68.53	Clear
0915	13.4	755.2	0.69	6.77	216	0.69	67.60	Clear
0920	13.4	784.7	0.47	6.69	23	0.67	67.44	Clear
0925	13.6	792.5	0.72	6.67	-10	0.76	67.25	Clear
0930	13.6	794.1	0.58	6.66	-29	0.74	67.25	Clear
0935	13.7	795.5	0.49	6.67	-38	0.79	67.21	Clear
0940	13.6	793.5	0.40	6.67	-42	0.77	67.25	Clear

(0940) Readings Stable / Sample Time (0945)

Samples Collected: (9) 8260D, (9) 8260C, (6) 8270D, (3) TM

(1007)	14.0	792.8	0.50	6.69	-66	0.90	67.40	Clear

16WDUP - Sample Time (1000) / Sampled from 16WC1A*

Samples collected: (3) 8260D, (3) 8260C, (2) 8270D, (1) TM

5/16/23 RFAAP: UNIT-16 / RFC · ABP F.B.#15

16MW9: CB: 50

DTW: 63.68 / POST PURGE DTW: 64.31 / BEGIN PURGE (1019) / FINAL PURGE clear

TIME	Temp (°C)	Cond mS/cm	DO mg/L	pH	ORP (mV)	TURB (NTU)	DTW	Desc
(1020)	14.0	896.3	3.82	6.85	-44	4.80	64.31	clear
(1025)	14.0	930.3	0.91	6.70	-15	29.6	64.44	slightly cloudy
(1030)	13.8	932.3	0.45	6.62	-14	9.75	64.28	clear
(1035)	13.7	930.5	0.37	6.58	-14	6.63	64.35	clear
(1040)	13.7	931.4	0.33	6.62	-15	6.45	64.41	clear
(1045)	13.9	927.6	0.33	6.62	-16	3.25	64.29	clear

(1045) Readings stable / Sample Time (1050)

Samples Collected: (6) 8260D, (3) 8260C, (2) 8270D, (1) TM

(1055)	14.0	923.5	0.46	6.63	-17	3.46	64.31	clear

16C-1: CB: 40

DTW: 47.39 / POST PURGE DTW: 47.40 / BEGIN PURGE (1107) / FINAL PURGE Clear

TIME	TEMP (°C)	Cond mS/cm	DO mg/L	pH	ORP (mV)	TURB (NTU)	DTW	Desc.
(1108)	16.1	523.1	7.92	7.88	-72	2.48	47.40	clear
(1113)	14.0	767.1	1.68	6.83	-9	1.50	47.39	clear
(1118)	14.1	779.6	1.10	6.67	0	2.93	47.41	clear
(1123)	14.5	771.3	0.73	6.63	5	1.41	47.41	clear
(1128)	14.3	725.1	0.61	6.57	10	1.11	47.40	clear
(1133)	14.2	710.5	0.51	6.54	15	0.90	47.40	clear

(1133) Readings stable / Sample Time (1135). 47.40 clear

Samples Collected: (96) 8260D, (3) 8260C, (2) 8270D, (1) TM

(1141)	13.9	702.9	0.45	6.51	22	1.06	47.40	clear

General Notes-

Weather: Sunny, clear & 60°-80°'s

PPE - Nitrile gloves, eye protection & safety boots

Calibrations - Myron L Ultrameter & YSI DO meter

pH: 4.00 - 4.00, 7.00 - 7.00, 10.00 - 10.00

Conductivity reads 1413 µS/cm in a 1413 µS/cm stnd.

HACH 2100Q Turbidimeter: 0.02-1000 NTU

- Dedicated well skirts & tubing used at each well.
- All equipment deconned before & after event and between use at each sample location.
- All purge water collected & disposed of at dedicated on-site location.
- All samples collected, transported & shipped on-ice in coolers.
- Sample collection order: 8260D & TM
- All wells purged & sampled at 0.25L/MIN.
- All DTW's collected in feet.

SAMPLE ANALYSIS	PRESERVATIVE
8260D	HCL
T.M.	HNO_3

- VOAs collected from one pulse from bladder pump.
- Bladder pump setting @ 4 cycles/min. - 5 sec DISCHARGE, 10 sec RECHARGE

STATIC WATER LEVEL TABLE (measured in feet)

WELL	DTW	P/PURGE DTW	NOTES	WELL	DTW	P/PURGE DTW	NOTES
5W8B	13.58	14.15	Pad ok	5WC1A	11.99	N/A	
5W12A	9.98	10.10	Pad ok; put up signage.	5W10A	12.39	N/A	
5W7B	7.98	8.03	Pad ok	5WC11	14.41	N/A	—
5W5B	7.91	8.22	Pad ok	5WC12	14.79	N/A	—
5WC21	7.98	8.00	Pad ok	S5W5	6.74	N/A	
5WC22	7.94	8.01	Pad ok	S5W6	5.33	N/A	
5WC23	7.37	7.42	Pad ok	S5W7	10.50	N/A	
SWL's ONLY				S5W8	11.09	N/A	
5W9A	0.54			5W11A	8.79	N/A	

7/25/23 RAMP: UNIT-5/547076/KFC.ABP F.B.7/15

Confidence Solution Value Range

BATCH #: 22G1C DATE OPENED: 7/24/23

	Temp (°C) Actual	Temp (°C) Range	Cond mS/cm Actual	Cond mS/cm Range	ORP (mV) Actual	ORP (mV) Range	pH Actual	pH Range
PRE	22.0	21-25	7712	7630-8010	255	212-242	7.07	6.8-7.2
POST	24.1	21-25	7818	7630-8010	225	212-242	6.97	6.8-7.2

5W8B: DTW: 13.58 P/Purge DTW: 14.15 CB: 25

Begin Purge (0759) Initial Purge - clear

TIME	TEMP (°C)	Cond mS/cm	DO mg/L	pH	ORP (mV)	Turb (NTU)	DTW	Desc
(0800)	15.5	99.5	5.00	6.27	218	1.86	14.12	Clear
(0805)	15.8	80.42	4.69	4.81	244	2.36	14.17	Clear
(0810)	15.8	64.96	4.56	4.46	261	1.44	14.12	Clear
(0815)	15.8	61.85	4.56	4.37	267	1.75	14.10	Clear
(0820)	15.8	59.23	4.60	4.32	270	3.32	14.10	Clear
(0825)	15.7	58.78	4.62	4.29	271	3.23	14.11	Clear
(0825)	Readings Stable / Sample Time (0830) / Samples Collected: (3) 82600, (1) TM							
(0831)	15.4	58.32	4.66	4.34	270	4.15	14.15	Clear

5W12A: DTW: 9.98 P/Purge DTW: 10.10 CB: 20

Begin Purge (0844) Initial Purge - Clear

Time	Temp °C	Cond mS/cm	DO mg/L	pH	ORP (mV)	Turb (NTU)	DTW	Desc
(0845)	14.6	490.3	3.52	5.97	223	1.22	10.08	Clear
(0850)	14.6	497.5	1.99	6.34	227	2.14	10.09	Clear
(0855)	14.5	497.2	1.36	6.34	228	1.85	10.10	Clear
(0900)	14.5	496.3	1.29	6.39	223	1.54	10.10	Clear
(0905)	14.6	498.6	1.47	6.53	218	1.45	10.10	Clear
(0910)	14.7	494.2	1.32	6.55	212	1.94	10.10	Clear
(0915)	14.6	496.9	1.44	6.57	214	1.48	10.14	Clear
(0915)	Readings Stable / Sample Time (0920) / Samples Collected: (3) 82600, (1) TM							
(0922)	14.8	494.2	1.48	6.53	202	1.32	10.10	Clear

7/25/23

5W7B DTW: 7.98 P/Purge DTW: 8.03 CB: 23

Begin Purge (0932) Initial Purge: Clear

Time	Temp °C	Cond. mS/cm	DO mg/L	pH	ORP (mV)	Turb (NTU)	DTW	Desc
(0933)	16.0	207.4	3.41	6.51	212	0.95	8.07	clear
(0938)	16.4	199.5	2.73	5.45	216	0.98	8.00	clear
(0943)	16.4	201.9	2.57	5.19	218	1.07	8.00	clear
(0948)	15.6	200.2	2.49	5.02	219	1.28	8.00	clear
(0953)	16.1	202.3	2.73	4.92	226	1.15	8.01	clear
(0958)	15.6	198.5	2.76	4.93	221	1.14	8.00	clear
(1003)	15.6	200.8	2.82	4.89	229	1.32	8.00	clear

(1003) Readings Stable / Sample Time (1005) / Samples collected: (9)8260D, (1)TM

(1008)	15.5	202.8	2.82	4.87	231	1.12	8.03	clear

5W5B DTW: 7.91 P/Purge DTW: 8.22 CB: 20

Begin Purge (1019) Initial Purge — Clear

Time	Temp °C	Cond. mS/cm	DO mg/L	pH	ORP (mV)	Turb (NTU)	DTW	Desc
(1020)	14.8	325.7	2.42	5.24	225	0.94	8.17	clear
(1025)	14.7	324.3	2.19	5.26	225	0.68	8.20	clear
(1030)	14.7	324.2	1.83	5.33	224	0.80	8.17	clear
(1035)	14.8	327.0	1.65	5.32	226	1.47	8.18	clear
(1040)	14.7	325.3	1.66	5.27	226	0.67	8.18	clear
(1045)	14.7	326.9	1.70	5.24	226	0.76	8.20	clear

(1045) Readings Stable / Sample Time (1050) / Samples collected: (3)8260D, (1)TM

(1053)	14.7	325.1	1.67	5.29	223	0.84	8.22	clear

7/25/23 RMAP/UNIT-5/547076/KFC-ABP F.B.#15

SWC22: DTW = 7.94 P/Purge DTW = 8.01 [CB: 20]

Begin Purge (1101) Initial Purge - Clear

TIME	Temp °C	Cond mS/cm	DO mg/L	pH	ORP (mV)	Turb (NTU)	DTW	Desc
(1102)	15.2	880.7	1.65	5.92	207	2.43	7.96	Clear
(1107)	14.9	887.3	2.07	6.10	201	7.73	7.96	Clear
(1112)	15.1	880.7	1.73	6.57	200	15.5	8.01	Clear w/ Black particles
(1117)	15.1	874.8	1.76	6.69	192	16.3	7.97	Clear w/ Black particles
(1122)	14.6	866.9	1.53	6.71	186	14.1	7.97	"
(1127)	14.5	874.4	1.79	6.75	184	12.1	7.99	"
(1132)	14.7	873.2	1.77	6.79	175	13.6	7.99	"
(1137)	14.7	875.5	1.78	6.75	176	13.4	7.99	"
(1137)	Readings Stable / Sample Time (1140) / Samples Collected: (3)8260D, (1)TM							
(1142)	14.6	871.6	1.69	6.79	161	15.5	8.01	"

SWC23 DTW: 7.37 P/Purge DTW: 7.42 [CB: 30]

Begin Purge (1205) Initial Purge: Clear

Time	Temp °C	Cond. mS/cm	DO mg/L	pH	ORP (mV)	Turb (NTU)	DTW	Desc
(1206)	14.7	924.1	1.30	6.81	151	1.03	7.38	Clear
(1211)	15.9	903.7	1.94	6.79	150	5.24	7.38	Clear
(1216)	15.7	902.7	1.72	6.78	150	4.74	7.39	Clear
(1221)	15.7	903.5	1.62	6.79	146	1.75	7.40	Clear
(1226)	15.9	904.3	1.62	6.83	142	1.29	7.40	Clear
(1231)	15.7	905.1	1.52	6.82	139	0.83	7.42	Clear
(1231)	Readings Stable / Sample Time (1235) / Samples Collected: (3)8260D, (1)TM							
(1237)	15.1	899.9	1.61	6.81	135	0.75	7.42	Clear

:20		
TW	Desc.	
.96	Clear	
.96	Clear	
.01	Clear w/ Black particle	
.97	Clear w/ Black particles	
.97	"	
.99	"	
.99	"	
.99	"	
(1) TM		
.01	"	
Desc		
Clear		
clear		
clear		
Clear		
clear		
Clear		
(1) TM		
clear		

5WC21: DTW: 7.98 P/PURGE DTW: 8.00 CB: 25

Begin Purge (1240) Initial Purge -

TIME	TEMP (°C)	Cond (mS/cm)	DO (mg/L)	pH	ORP (mV)	TURB (NTU)	DTW	Desc.
(1241)	14.1	538.2	1.61	6.53	147	38.5	8.02	Sl. cloudy
(1246)	15.7	518.5	1.68	6.01	153	79.0	8.00	cloudy
(1251)	15.9	507.5	1.62	5.67	157	80.1	7.98	cloudy
(1256)	14.8	498.6	1.61	5.57	160	77.0	7.99	cloudy
(1301)	15.1	504.0	1.31	5.77	205	94.5	8.04	cloudy
(1306)	14.7	487.8	0.88	5.55	202	101	8.00	cloudy
(1311)	14.7	484.7	0.88	5.45	195	93.9	8.00	"
(1316)	14.6	484.9	0.92	5.41	190	97.5	8.00	"
(1321)	14.8	487.2	0.89	5.40	191	95.0	8.00	"

(1321) Readings Stable / Sample Time (1325) (AAP 7-25) / Samples Collected: (3) 82600, (1) TM

Post Purge Readings:

(1332)	14.8	483.2	0.89	5.51	181	97.0	8.00	"

5WC21 DUP (AAP 12-21-23) : Sample Time (1330)

Samples Collected: (3) 82600D, (1) TM

Collected from 5WC21

(AAP 12/21/23)

F.B.#15

eB: 27

w	Desc
17	clear
77	clear
17	clear
7	clear
16	clear
16	clear
00, (2)	RSK 175
lK,	
o	clear
1, (2) 8330B	
chlorate	

7/26/23 · RAAP (UNIT-16) / 547076 / KFC-ABP F.B.#15

General Notes: UNIT-16

- Weather - Foggy + 60's → Sunny + 80's
- PPE - Nitrile gloves, eye protection + safety boots
- Calibrations - Myron L Ultrameter / YSI DO meter / HACH 2100Q Turbidimeter
- pH - 4.00 - 4.00, 7.00 - 7.00, 10.00 - 10.00 / DO % = 99.2 %
  Conductivity reads 1413 µS/cm in a 1413 µS/cm std.
  HACH 2100Q Turbidimeter: 0.02 - 1000 NTU
- Dedicated well skirts + tubing used at each well.
- All equipment decon'ed before + after event and between use at each sample location.
- All purge water collected + disposed of at a dedicated on-site location.
- All samples collected, transported + stored on ice in coolers.
- Sample collection order: 8260D, 8270D/E, TM, CN.

- All wells purged + sampled at 0.25 L/min.
- All DTW's measured in feet.

SAMPLE ANALYSIS	Preservative	Sample Analysis	Preservative
8260D	HCL	TM	HNO3
8270 E/D	—	CN	NaOH

- VOAs collected from one pulse from bladder pump.
- Bladder pump setting: 4 cycles/min - 5 sec discharge/10 sec recharge

STATIC LEVEL WATER TABLE (Measured in feet)

WELL	DTW	P/PURGE DTW	NOTES	WELL	DTW	P/PURGE DTW	Notes
16-2	55.82	55.89	Pad ok	16MW9	64.79	~~69.96~~ 66.10 (ABP 7-27)	Pad ok
16-3	56.03	63.02	Pad ok	16C1	48.02	48.06	Pad ok
16-5	4.18	17.22	Pad ok	SMLS ONLY			
16WC2B	53.09	60.90	Pad ok	16C3	65.65		
16WC1B	67.71	68.19	Pad ok	16CDH3	DRY @ 68.55		
16WC1A	67.46	69.96	Pad ok	16WC2A	Dry @ 62.30		
16MW8	73.18	T.O.P.*	Pad ok	16-1	44.21		

* denotes top of pump

7/26/23 RAAP UNIT-16 / 547076 / KFC-ABP F.B. #15

CONFIDENCE SOLUTION VALUE RANGE

BATCH #: 22GLC Date Opened: 7/24/23

	TEMP (°C)		Cond (mS/cm)		ORP (mV)		pH	
	Actual	Range	Actual	Range	Actual	Range	Actual	Range
PRE-	22.1	21-25	7927	7630-8010	245	212-242	7.00	6.8-7.2
POST-	29.7	26-30	7873	7890-8080	206	204-234	6.94	6.8-7.2

16-5: DTW: 4.18 P/Purge DTW: 17.22 [cb: 45]

Begin Purge (0713) Initial Purge- Clear

TIME	TEMP (°C)	COND (mS/cm)	DO (mg/L)	pH	ORP (mV)	TURB (NTU)	DTW	Desc.
(0715)	14.4	544.2	4.99	6.61	220	3.16	5.24	clear
(0720)	13.8	533.0	3.32	6.50	218	2.78	6.72	clear
(0725)	13.7	534.5	2.61	6.66	214	2.73	9.32	clear
(0730)	13.4	533.5	3.32	6.77	211	3.43	11.73	clear
(0735)	13.4	533.3	3.32	6.82	210	4.84	13.09	clear
(0740)	13.2	533.6	3.41	6.88	210	4.18	15.36	clear

(0740) Reading's stable / SAMPLE TIME (0745) HP (7.02)

Samples collected: (3) 8260D, (1) TM & (2) 8270D

(0750)	13.4	533.7	3.46	6.94	210	6.80	17.22	clear

16 SPRING:

TIME	TEMP (°C)	COND (mS/cm)	DO (mg/L)	pH	ORP (mV)	TURB (NTU)	Desc.
(0755)	14.4	579.9	5.61	7.18	201	6.63	Clear

Sample Time (0800)

Samples collected: (3) 8260D, (1) TM & (2) 8270D

16WC2B : DTW: 53.09 Post Purge DTW: 60.90 CB: 60

Begin Purge (0812) Initial Purge: Clear

Time	Temp °C	Cond mS/cm	DO mg/L	pH	ORP (mV)	Turb (NTU)	DTW	Desc.
(0813)	14.7	315.5	7.25	7.51	200	0.97	54.29	Clear
(0818)	14.3	317.7	3.66	7.51	198	0.90	56.36	Clear
(0823)	15.2	316.2	2.77	7.52	197	0.90	57.56	Clear
(0828)	14.8	315.8	2.99	7.54	195	0.80	57.85	Clear
(0833)	14.7	315.2	2.80	7.55	192	0.85	58.87	Clear
(0838)	15.0	316.8	2.92	7.55	190	0.95	59.36	Clear

(0838) Readings Stable Sample Time (0840)

Samples Collected: (3) 8260D, (2) 8270D, (1) TM

(0848)	14.9	317.5	2.95	7.55	181	1.27	60.90	Clear

16-2 : DTW: 55.82 Post Purge DTW: 55.89 CB: 68

Begin Purge (0858) Initial Purge – Clear

Time	Temp °C	Cond mS/cm	DO mg/L	pH	ORP (mV)	Turb (NTU)	DTW	Desc
(0900)	15.2	591.0	6.26	7.33	189	1.05	55.84	Clear
(0905)	14.4	625.1	6.04	7.18	191	1.62	55.86	Clear
(0910)	14.2	624.4	5.51	7.15	185	1.43	55.87	Clear
(0915)	14.0	619.5	5.60	7.00	183	1.44	55.87	Clear
(0920)	14.2	615.0	5.26	6.98	182	1.84	55.88	Clear
(0925)	14.3	600.2	5.64	6.96	176	1.59	55.88	Clear

(0925) Readings Stable Sample Time (0930)

(0932)	14.3	596.3	5.57	6.89	177	1.63	55.89	Clear

16MW8: DTW = 73.23 P/PURGE DTW = T.O.P. CB: 55

Begin Purge (0944) Initial Purge: Clear

Time	Temp°C	Cond. mS/cm	DO mg/L	pH	ORP (mv)	Turb (NTU)	DTW	Desc
(0945)	17.1	137.3	4.78	6.71	189	1.44	73.23	Clear
(0948)	17.5	144.0	4.44	5.60	193	1.15	73.45	Clear
(0951)	17.2	152.2	3.61	5.35	204	1.01	73.49	Clear
(0954)	17.1	154.5	2.99	5.13	204	1.39	73.67	Clear
(0957)	16.9	153.7	2.96	5.14	201	1.64	73.76	Clear
(1000)	17.0	152.0	2.69	5.11	202	3.06	73.88	Clear

(1000) Readings Stable Sample Time (1005)

Samples collected: (9) 8260D, (2) 8270D, (6) 8270E, (1) Cyanide, (1) TM

(1022)	16.8	155.3	2.37	5.08	204	1.58	T.O.P	Clear

* Reduced Reading interval to 3 minutes due to low water level.
* T.O.P. - Top of pump.

16-3: DTW: 56.03 Post Purge DTW: 63.02 CB: 50

Begin Purge (1043) Initial Purge - Clear

Time	Temp°C	Cond. mS/cm	DO mg/L	pH	ORP (mv)	Turb (NTU)	DTW	Desc
(1044)	16.9	235.4	6.00	5.31	175	1.38	56.90	Clear
(1049)	16.5	242.4	5.07	6.71	155	2.92	57.91	Clear
(1054)	15.6	241.4	5.40	6.96	150	3.21	58.67	Clear
(1059)	14.8	242.0	5.41	7.07	147	4.23	60.47	Clear
(1104)	15.8	240.3	5.43	7.23	140	3.41	61.20	Clear
(1109)	15.4	241.8	5.47	7.29	136	3.22	61.78	Clear
(1114)	15.3	242.0	5.31	7.30	131	2.74	62.31	Clear

(1114) Reading Stable Sample Time (1115)

Samples collected: (3) 8260D, (2) 8270D, (1) TM

(1120)	15.3	240.1	5.21	7.39	125	2.53	63.02	Clear

F.B.#15

B: 55

	Desc
3	Clear
5	Clear
9	clear
7	Clear
6	Clear
8	clear

anide, (1)TM

P clear

vel.

	Desc
	Clear
	clear
1	clear
1	clear
	Clear
	Clear
1	Clear
2	Clear

7/26/23 RAAP(UNIT-16)/547076/KFC·ABP F.B.#15

16WC1B : DTW: 67.71 Post Purge DTW: 68.19 CB: 95

Begin Purge (1135) Initial Purge – Clear

Time	Temp °C	Cond. mS/cm	DO mg/L	pH	ORP (mV)	Turb (NTU)	DTW	Desc
(1136)	15.8	392.8	4.34	6.87	142	70.6	67.89	Sl. Cloudy ~~Clear~~
(1141)	16.8	404.7	5.17	6.45	144	73.0	67.97	Sl. Cloudy w/ Black particles
(1146)	16.9	400.3	4.82	6.41	142	51.2	68.02	"
(1151)	15.9	406.5	5.92	6.52	143	58.5	68.02	"
(1156)	15.4	405.2	5.66	6.47	146	48.4	68.10	"
(1201)	15.5	406.5	5.63	6.47	147	36.3	68.18	"

(1201) Readings Stable Sample Time (1205)

Samples Collected: (9) 8260D, (2) 8270E, (2) 8270D, (1) Cyanide, (1) TM

(1240)	15.8	415.7	5.84	6.49	192	16.8	68.19	"

7/27/23 · RAAP (UNIT-16) / 547076 / RFC-ABP F.B.#15

GENERAL NOTES:

- Weather: Sunny & 70°-80°s
- PPE - Nitrile gloves, eye protection & safety boots
- Calibrations: Myron L Ultrameter & YSI DO Meter = 993?
  pH: 4.00 = 4.00, 7.00 = 7.00, 10.00 = 10.00
  Conductivity reads 1413 µS/cm in a 1413 µS/cm std.
  HACH 2100Q Turbidimeter: 0.02-1000 NTU
- Dedicated well skirts & tubing used at each well.
- All equipment deconned before & after event and between use at each sample location.
- All purge water collected & disposed of at a dedicated, on-site location.
- All samples collected, transported & stored on ice in coolers.
- Sample collection order: 8260D, 8270D/E, TM & CN.
- All wells purged & sampled at 0.25L/min.
- All DTW's measured in feet.

Sample Analysis	Preservative	Sample Analysis	Preservative
8260D	HCL	TM	HNO_3
8270D/E	—	CN	NaOH

- VOA's collected from one pulse from bladder pump.
- Bladder pump setting: 4 cycles/min. 5 second discharge, 10 second recharge

CONFIDENCE SOLUTION VALUE RANGE

BATCH#-22G1C DATE OPENED: 7/24/23

	Temp(°C)		Cond µS/cm		ORP(mV)		pH	
	Actual	Range	Actual	Range	Actual	Range	Actual	Range
PRE-	21.5	21-25	7759	7630-8010	245	212-242	6.91	6.8-7.2
POST-	27.4	26-30	7891	7690-8080	241	204-234	6.92	6.8-7.2

7/27/23 · RAAP (UNIT-16/54706) / 12FC · ABP

16WC1A: DTW=67.46 P/PURGE DTW=69.96 CB: 60

Begin Purge (0912) Initial Purge - Clear

Time	Temp (°C)	Cond. (µS/cm)	DO (mg/L)	pH	ORP (mV)	Turb (NTU)	DTW	Desc.
(0913)	15.5	728.1	2.12	6.34	228	4.28	69.25	Clear
(0918)	14.4	734.3	0.53	6.68	218	1.08	69.67	Clear
(0923)	14.3	801.6	0.44	6.65	190	0.76	69.65	Clear
(0928)	14.2	826.7	0.35	6.55	95	0.77	69.70	Clear
(0933)	14.4	830.4	0.30	6.54	22	0.81	69.92	Clear
(0938)	14.3	830.7	0.36	6.55	-4	1.21	69.25	Clear
(0943)	14.4	844.6	0.42	6.55	-20	1.23	69.21	Clear
(0948)	14.5	840.8	0.39	6.56	-31	1.17	69.68	Clear
(0953)	14.5	836.8	0.38	6.57	-33	0.96	69.81	Clear

(0953) Readings Stable Sample Time (0955)

Samples collected: (27) 8260D, (46) 8270D, (18) 8270E, (3) Cyanide, (3) TM

(1013)	14.2	861.9	0.54	6.93	-20	1.54	69.96	Clear

16W DUP: Sample Time (1020) *collected from 16WC1A

Samples collected: (9) 8260D, (2) 8270D, (6) 8270E, (1) Cyanide, (1) TM

16MW9: DTW: 64.79 Post Purge DTW: 66.10 CB: 50

Begin Purge (1053) Initial Purge - Clear

Time	Temp °C	Cond. (µS/cm)	DO (mg/L)	pH	ORP (mV)	Turb (NTU)	DTW	Desc
(1054)	15.3	931.1	5.27	6.81	-62	8.55	65.73	Clear
(1059)	15.2	966.7	3.23	6.78	-46	1.83	66.10	Clear
(1104)	15.3	963.6	0.94	6.76	-40	2.24	65.96	Clear
(1109)	15.3	974.3	1.00	6.73	-31	2.22	65.89	Clear
(1114)	15.4	962.9	0.59	6.53	-26	1.91	65.90	Clear
(1119)	15.5	960.4	0.43	6.58	-24	3.52	66.10	Clear
(1124)	15.2	963.6	0.54	6.53	-21	1.72	66.10	Clear

(1124) Readings Stable Sample Time (1125)

Samples collected: (9) 8260D, (2) 8270D, (6) 8270E, (1) Cyanide, (1) TM

(1144)	15.0	954.6	0.84	6.69	-27	1.09	66.10	Clear

7/27/23 RFAAP

16C1 : DTW: 48.02 Post Purge DTW: 48.06 CB: 55

Begin Purge (1202) Initial Purge – clear

Time	Temp °C	Cond mS/cm	DO mg/L	pH	ORP (mV)	Turb (NTU)	DTW	Desc
(1203)	15.5	685.4	1.80	7.00	-35	1.00	48.04	clear
(1208)	15.6	787.1	1.93	6.54	-6	0.86	48.04	clear
(1213)	15.6	724.3	1.61	6.46	3	0.93	48.05	clear
(1218)	15.4	697.2	1.27	6.40	13	0.83	48.05	clear
(1223)	15.3	684.9	0.96	6.38	19	0.96	48.06	clear
(1228)	15.4	675.6	0.63	6.34	25	1.05	48.05	clear
(1233)	15.4	678.7	0.56	6.48	40	0.90	48.05	clear
(1238)	15.3	675.3	0.62	6.37	43	0.98	48.05	clear
(1243)	15.4	677.0	0.60	6.39	44	0.79	48.06	clear

(1243) Readings Stable Sample Time (1245).

Samples Collected: (11) 8260D, (2) 8270D, (6) 8270E, (1) Cyanide, (1) TM

(1257)	15.5	671.4	0.87	6.54	42	0.84	48.06	clear

10/05/23. RFAAP UNIT16/54707L/KFC-SW F.B.#15

General Notes: * UNIT-16 Verification

Weather: Mostly Cloudy & 70°s

PPE: Nitrile gloves, eye protection & safety boots

Calibrations: Hanna Multimeter HI9829

pH: 4.00 = 4.00, 7.00 = 7.00, 10.00 = 10.00

Conductivity reads 1413 µS/cm in a 1413 µS/cm standard

HACH 2100Q Turbidimeter: 0.02-1000 NTU

D.O. % = 100.0 %

Dedicated well skids & tubing used at each well

All equipment deconned before & after event and between use at each sample location

All purge water collected & disposed of at a dedicated on-site location

All samples collected, transported & stored on ice in coolers.

Sample collection order: See specific Sample ID

All wells purged & sampled at 0.25L/min

All DTW's measured in feet

Sample Analysis	Preservative	Sample Analysis	Preservative
TOTAL METALS	HNO_3	Cyanide	NaOH

Bladder pump settings: 4 cycles/min 5 sec discharge 10 sec recharge

CONFIDENCE SOLUTION VALUE RANGE

BATCH #: 226JC DATE OPENED: 10/02/23

	TEMP (°C)		COND (mS/cm)		ORP (mV)		pH	
	Actual	Range	Actual	Range	Actual	Range	Actual	Range
PRE.	23.2	21-25	7722	7630-8010	220	212-242	6.97	6.8-7.2
POST	23.9	21-25	7510	7630-8010	218	212-242	6.91	6.8-7.2

10/05/23 RFAAPMNIT-16/547076/KFC-SW F.B #15

16WC1A: CB: 60 Begin Purge (1325)

DTW: 68.87 / Post Purge DTW: 69.98 Initial Purge - Clear

TIME	TEMP (°C)	Cond mS/cm	DO mg/L	pH	TURB (NTU)	ORP (mV)	DTW	Desc
(1327)	16.60	783	3.47	8.26	1.98	-57.3	69.63	Clear
(1332)	16.23	773	1.22	7.79	2.12	-33.2	69.71	Clear
(1337)	15.99	748	0.79	7.77	1.26	-19.1	69.85	Clear
(1342)	15.76	751	0.53	7.84	0.82	-54.9	69.99	Clear
(1347)	15.46	776	0.50	7.73	0.82	-73.4	70.09	Clear
(1352)	15.89	785	0.55	7.64	0.89	-75.1	69.90	Clear
(1357)	15.59	792	0.52	7.62	0.76	-75.1	69.98	Clear

(1357) Readings Stable 10-05-23 SW

Sampler Collected (1400): ~~(3) 8260, (2) 8011,~~ (1) TM

16 DUP2 Collected from 16WC1A

Sample Time (1405) Sampler Collected: TM

(1407)	15.43	790	0.51	7.53	~~-74.2~~ 0.92 SW	-74.2	70.13	Clear

16MWC9 CB: 64 Begin Purge (1410)

DTW = 65.87 Post Purge DTW = 66.70 Initial Purge - Clear

Time	TEMP (°C)	Cond. mS/cm	DO mg/L	pH	TURB (NTU)	ORP	DTW	DESC.
(1413)	18.18	959	3.13	7.31	7.81	-7.8	66.69	Clear
(1418)	15.60	982	0.93	7.10	7.79	-23.9	67.06	Clear
(1423)	16.77	981	0.77	7.05	1.44	-23.2	66.86	Clear
(1428)	16.65	974	0.66	7.02	1.33	-24.4	66.87	Clear
(1433)	16.67	967	0.58	6.98	1.70	-23.7	66.76	Clear
(1438)	17.52	965	0.55	6.93	1.85	-25.4	66.56	Clear

(1438) Readings Stable

Sample Collected (1440) (1) CN

16 DUP1 Collected from 16MW9 (1445) Sample Time

(1446)	19.34	960	0.69	6.87	1.29	-27.7	66.70	Clear

10/17/23 RFAAP-UNIT-16/547076/KFC-SW F.B. #15

General Notes:

- Weather: Overcast & 40°-50's
- PPE - Nitrile gloves, eye protection & safety boots
- Calibrations - HANNA Multimeter HI 9829
  pH: 4.00 = 4.00, 7.00 = 7.00, 10.00 = 10.00
  Conductivity reads 1413 µS/cm in a 1413 µS/cm stnd.
  HACH 2100Q Turbidimeter: 0.02-1000 NTU
  D.O. % = 100.0 %
- Dedicated well skirts and tubing used at each well.
- All equipment decon'ed before & after each event and between use at sample location.
- All purge water collected & disposed of at a dedicated and on-site location.
- All samples collected, stored & transported on ice in coolers.
- Well purged and sampled at 0.25 L/min.
- DTW measured in feet.

Sample Analysis	Preservative
TOTAL METALS	HNO_3

- Bladder pump setting: 4 cycles/min: .5 sec discharge, .10 sec recharge

CONFIDENCE SOLUTION VALUE RANGE

BATCH #: 22G1C DATE OPENED: 10/02/23

	TEMP (°C)		COND µS/cm		ORP (mV)		pH	
	Actual	Range	ACTUAL	RANGE	ACTUAL	RANGE	ACTUAL	RANGE
PRE-	17.3	16-20	7781	7630-7970	228	222-252	7.02	6.8-7.2
POST	18.1	16-20	7713	7630-7970	231	222-252	7.06	6.8-7.2

- Pulled dedicated well pump and bailed well three bore volumes before sampling.

~~16WC1B - CB: / TD: 75.15 Begin Purge ( )~~
~~DTW: 69.45 POST ~~PURGE DTW~~ 5.70 × 0.163 = 0.929 × 3 = 2.78 ~~Initial Purge~~~
~~TIME TEMP(°C) COND µS/cm DO mg/L pH TURB (NTU) ORP (mV) DTW DESC.~~
~~( ) Dedicated well pump pulled and well bailed, per Ross Miller's direction. Purge 10-17-23~~

16WC1B: TD: 75.15 Begin Purge (1020)
DTW = 69.45 Initial Purge - SL. Cloudy
5.70 × 0.163 = 0.929 × 3 = 2.78

TIME	Temp(°C)	Cond µS/cm	DO mg/L	pH	TURB (NTU)	ORP (mV)	BAIL (#)	VOL (GAL)	DESC
(1021)	13.2	3.90	2.97	6.61	65.5	204.9	1	0.25	SL. Cloudy
(1026)	13.1	411	2.62	6.63	23.8	221.6	4	1.00	Clear
(1030)	13.1	466	2.32	6.61	15.6	222.7	8	2.00	Clear
(1034)	13.2	492	2.18	6.71	10.2	225.6	12	3.00	Clear

(1034) well pumped ~ 3.0 gallons
Sample Time (~~1035~~ 0735) Turbidity at 5.83
Sample collected: (1) TM sample time = ~~48.5~~

16DUP2:

Sample Time (~~1100~~ 0740)
Samples collected: (1) TM

Post sampling DTW = 69.28
TD = 75.14

16WC1B: *Used first bailer to purge well.

TD: 75.15 Begin Purge (1020)

DTW = 69.45 Initial Purge: Sl. Cloudy

5.70 x 0.163 = 0.929 x 3 = 2.78 gallons

TIME	TEMP (°C)	COND (uS/cm)	DO (mg/L)	pH	TURB (NTU)	ORP (mV)	BAIL (#)	VOL (GAL)	DESC.
1021	13.2	390	2.97	6.61	65.5	204.9	1	0.25	Sl. Cloudy
1026	13.1	411	2.62	6.63	23.8	221.6	4	1.00	Clear
1030	13.1	466	2.32	6.61	15.6	222.7	8	2.00	Clear
1034	13.2	492	2.18	6.71	10.2	225.6	12	3.00	Clear

1034 Well purged w 3.0 gallons

Will allow well to settle before returning tomorrow to collect samples.

10/18/23: *Used second bailed to collect samples.

16WC1B: Sample Time (0735)
Sample collected: (1) TM

16DUP2: Sample Time (0740)
Sample collected: (1) TM

Turbidity at sample time = 5.83

Postsampling Total Depth = 75.14
" " Depth to Water = 69.28

APPENDIX E

CORRESPONDENCE

Commonwealth of Virginia

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

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Travis A. Voyles
Acting Secretary of Natural and Historic Resources

Michael S. Rolband, PE, PWD, PWS Emeritus
Director
(804) 698-4020

December 12, 2022

Dear Interested Stakeholder:

This letter shares information about the updated Default 10^{-6} Alternate Concentration Limits (ACL) Table, effective January 12, 2023. The new, updated ACL Table issued as "Draft" (see attached) reflects the updates in the EPA Regional Screening Level (RSL) Table through May 2022.

The RSL update established new values for three constituents: acetone, *p*-cresol, and ethyl chloride (chloroethane), and 1,2,4,5 tetrachlrorobenzne. No other ACL values from the previous Solid Waste ACL Table have changed as a result of these modifications. The constituents with updated values are not believed to be common at solid waste facilities, therefore no impacts to the solid waste landfill groundwater monitoring programs within the Commonwealth are anticipated from this update. Please review the table and contact the Department if you have any questions regarding your 2023 groundwater monitoring program.

Please keep in mind that for chemicals with a Maximum Contaminant Level (MCL), the MCL will continue to be the groundwater protection standard (GPS). For metals, the regulations allow site specific background to be used upon Department approval instead of the ACL. Please note that copper and lead do not have an MCL but have an 'action level.' For the purpose of setting the Groundwater Protection Standard, these action levels are treated as MCLs.

In some instances, use of site specific ACLs may be warranted. Any proposed use of 10^{-5} ACL values should meet all of the technical criteria described in "Submission Instruction #28 For Applying For Site-Specific Alternate Concentration Limits At Solid Waste Landfills In Areas With Public Water Supplies (version date = January, 2015)" and the related Frequently Asked Questions (FAQ) document. Contact the Department if you have questions regarding such application.

If you have technical questions on ACL development, please contact Kyle Newman at (804) 659-1332 or kyle.newman@deq.virginia.gov. For further questions regarding the effect of the ACL use in groundwater monitoring or corrective action, please contact your regional office or the program Coordinator, Geoff Christe at (804) 912-3674 or geoff.christe@deq.virginia.gov.

Sincerely,

Brent Williams
Director, Office of Financial Responsibility & Waste Programs

Encl:

1. Default ACL Table Draft Update, December, 2022 (lower of 10^{-6} cancer risk and HQ =1)
2. Change log

Virginia DEQ ACL 1E-6/1 Tapwater RSL as ACL Changes Summary

Based on EPA RSL: May 2022

The following compounds were updated due to value changes to EPA RSL values published between May 2021 and May 2022.

CAS No.	Constituent	Updated ACL: Nov 2022	Current ACL: Nov 2021	Reason for Change
67-64-1	Acetone	18000	14000	RfCi Value Removed
106-44-5	Cresol, p-	370	1900	Updated RfDo
75-00-3	Ethyl Chloride (Chloroethane)	8300	21000	Updated RfCi
95-94-3	1,2,4,5 tetrachlrorobenzne	0.17	1.7	Updated RfDo

ACL Update: November 2022
Based on RSL: May 2022

Virginia DEQ ACL 1E-6/1 Tapwater RSL as ACL
ACL for VSWMR Table 3.1 Constituents

Refer to the notes provided at the end of this table for additional information

N	=	No	I	=	IRIS
Y	=	YES	P	=	PPRTV
RSL	=	Regional Screening Level	O	=	OPP
VOC	=	Volatile Organic Compound	A	=	ATSDR
V	=	Volatile	D	=	OW
M	=	Mutagen	C	=	Cal EPA
ACL	=	Alternate Concentration Limit (µg/L)	X	=	PPRTV Screening Level
MCL	=	Maximum Contaminant Level (µg/L)	H	=	HEAST
CAS RN	=	Chemical Abstracts Service Registry Number	G	=	See RSL User's Guide
SFO	=	Oral Slope Factor (mg/kg-day)	W	=	TEF applied
IUR	=	Inhalation Unit Risk (µg/m3)-1	E	=	RPF applied
RfDo	=	Chronic Oral Reference Dose (mg/kg-day)	c	=	cancer
RfCi	=	Chronic Inhalation Reference Concentration (mg/m3)	n	=	noncancer

CAS RN	Constituent	VOC	Mutagen	SFO (mg/kg-day)-1	key	IUR (µg/m3)-1	key	RfDo (mg/kg-day)	key	RfCi (mg/m3)	key	ACL 1E-6/1 (µg/L)	key	MCL (µg/L)
83-32-9	Acenaphthene	V						6.00E-02	I			530	n	
208-96-8	Acenaphthylene	V												
67-64-1	Acetone	V						9.00E-01	I			18000	n	
75-05-8	Acetonitrile; Methyl cyanide	V								6.00E-02	I	130	n	
98-86-2	Acetophenone	V						1.00E-01	I			1900	n	
53-96-3	2-Acetylaminofluorene; 2-AAF			3.80E+00	C	1.30E-03	C					0.016	c	
107-02-8	Acrolein	V						5.00E-04	I	2.00E-05	I	0.042	n	
107-13-1	Acrylonitrile	V		5.40E-01	I	6.80E-05	I	1.00E-02	A	2.00E-03	I	0.052	c	
309-00-2	Aldrin	V		1.70E+01	I	4.90E-03	I	3.00E-05	I			0.00092	c	
107-05-1	Allyl chloride	V		2.10E-02	C	6.00E-06	C			1.00E-03	I	0.73	c	
319-84-6	alpha-BHC			6.30E+00	I	1.80E-03	I	8.00E-03	A			0.0072	c	
92-67-1	4-Aminobiphenyl			2.10E+01	C	6.00E-03	C					0.003	c	
120-12-7	Anthracene	V						3.00E-01	I			1800	n	
7440-36-0	Antimony (Total)							4.00E-04	I	3.00E-04	A	7.8	n	6
7440-38-2	Arsenic (Total)			1.50E+00	I	4.30E-03	I	3.00E-04	I	1.50E-05	C	0.052	c	10
7440-39-3	Barium (Total)							2.00E-01	I	5.00E-04	H	3800	n	2000
71-43-2	Benzene	V		5.50E-02	I	7.80E-06	I	4.00E-03	I	3.00E-02	I	0.46	c	5
56-55-3	Benzo[a]anthracene; Benzanthracene	V	M	1.00E-01	E	6.00E-05	E					0.03	c	
50-32-8	Benzo[a]pyrene		M	1.00E+00	I	6.00E-04	I	3.00E-04	I	2.00E-06	I	0.025	c	0.2
205-99-2	Benzo[b]fluoranthene		M	1.00E-01	E	6.00E-05	E					0.25	c	
191-24-2	Benzo[ghi]perylene	V												
207-08-9	Benzo[k]fluoranthene		M	1.00E-02	E	6.00E-06	E					2.5	c	

Virginia DEQ ACL 1E-6/1 Tapwater RSL as ACL

100-51-6	Benzyl alcohol							1.00E-01	P			2000	n	
7440-41-7	Beryllium (Total)					2.40E-03	I	2.00E-03	I	2.00E-05	I	25	n	4
319-85-7	beta-BHC			1.80E+00	I	5.30E-04	I					0.025	c	
111-91-1	Bis(2-chloroethoxy)methane							3.00E-03	P			59	n	
111-44-4	Bis(2-chloroethyl) ether; Dichloroethyl ether	V		1.10E+00	I	3.30E-04	I					0.014	c	
108-60-1	Bis(2-chloro-1-methylethyl) ether; 2, 2'-Dichlorodiisopropyl ether; DCIP	V						4.00E-02	I			710	n	
117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)			1.40E-02	I	2.40E-06	C	2.00E-02	I			5.6	c	6
74-97-5	Bromochloromethane;.Chlorobromomethane	V								4.00E-02	X	83	n	
75-27-4	Bromodichloromethane;.Dibromochloromethane (THM)	V		6.20E-02	I	3.70E-05	C	8.00E-03	P			0.13	c	80
75-25-2	Bromoform; Tribromomethane (THM)	V		7.90E-03	I	1.10E-06	I	2.00E-02	I			3.3	c	80
101-55-3	4-Bromophenyl phenyl ether													
85-68-7	Butyl benzyl phthalate; Benzyl butyl phthalate			1.90E-03	P			2.00E-01	I			16	c	
7440-43-9	Cadmium (Total)					1.80E-03	I	1.00E-04	A	1.00E-05	A	1.8	n	5
75-15-0	Carbon disulfide	V						1.00E-01	I	7.00E-01	I	810	n	
56-23-5	Carbon tetrachloride	V		7.00E-02	I	6.00E-06	I	4.00E-03	I	1.00E-01	I	0.46	c	5
12789-03-6	Chlordane	V		3.50E-01	I	1.00E-04	I	5.00E-04	I	7.00E-04	I	0.02	c	2
108-90-7	Chlorobenzene	V						2.00E-02	I	5.00E-02	P	78	n	100
510-15-6	Chlorobenzilate			1.10E-01	C	3.10E-05	C	2.00E-02	I			0.31	c	
75-00-3	Chloroethane; Ethyl chloride	V								4.00E+00	P	8300	n	
67-66-3	Chloroform; Trichloromethane (THM)	V		3.10E-02	C	2.30E-05	I	1.00E-02	I	9.80E-02	A	0.22	c	80
91-58-7	2-Chloronaphthalene	V						8.00E-02	I			750	n	
95-57-8	2-Chlorophenol	V						5.00E-03	I			91	n	
7005-72-3	4-Chlorophenyl phenyl ether													
126-99-8	Chloroprene	V				3.00E-04	I	2.00E-02	H	2.00E-02	I	0.019	c	
7440-47-3	Chromium (Total)													100
218-01-9	Chrysene		M	1.00E-03	E	6.00E-07	E					25	c	
156-59-2	cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene	V						2.00E-03	I			36	n	70
10061-01-5	cis-1,3-Dichloropropene	V												
7440-48-4	Cobalt (Total)					9.00E-03	P	3.00E-04	P	6.00E-06	P	6	n	
7440-50-8	Copper (Total)							4.00E-02	H			800	n	1300
57-12-5	Cyanide	V						6.00E-04	I	8.00E-04	G	1.5	n	200
94-75-7	2,4-D; 2,4-Dichlorophenoxyacetic acid							1.00E-02	I			170	n	70
72-54-8	4,4'-DDD			2.40E-01	I	6.90E-05	C	3.00E-05	X			0.032	c	
72-55-9	4,4'-DDE	V		3.40E-01	I	9.70E-05	C	3.00E-04	X			0.046	c	
50-29-3	4,4'-DDT			3.40E-01	I	9.70E-05	I	5.00E-04	I			0.23	c	
319-86-8	delta-BHC													
2303-16-4	Diallate			6.10E-02	H							0.54	c	
53-70-3	Dibenz[a,h]anthracene		M	1.00E+00	E	6.00E-04	E					0.025	c	
132-64-9	Dibenzofuran	V						1.00E-03	X			7.9	n	
106-93-4	1,2-Dibrimoethane; Ethylene dibromide; EDB	V		2.00E+00	I	6.00E-04	I	9.00E-03	I	9.00E-03	I	0.0075	c	0.05
124-48-1	Dibromochloromethane; Chlorodibromomethane (THM)	V		8.40E-02	I			2.00E-02	I			0.87	c	80
96-12-8	1,2-Dibromo-3-chloropropane; DBCP	V	M	8.00E-01	P	6.00E-03	P	2.00E-04	P	2.00E-04	I	0.00033	c	0.2
91-94-1	3,3'-Dichlorobenzidine			4.50E-01	I	3.40E-04	C					0.13	c	

Virginia DEQ ACL 1E-6/1 Tapwater RSL as ACL

75-71-8	Dichlorodifluoromethane; CFC 12;	V						2.00E-01	I	1.00E-01	X	200	n	
107-06-2	1,2-Dichloroethane; Ethylene dichloride	V		9.10E-02	I	2.60E-05	I	6.00E-03	X	7.00E-03	P	0.17	c	5
75-34-3	1,1-Dichloroethane; Ethylidene chloride	V		5.70E-03	C	1.60E-06	C	2.00E-01	P			2.8	c	
75-35-4	1,1-Dichloroethylene; 1,1-Dichloroethene; Vinylidene chloride	V						5.00E-02	I	2.00E-01	I	280	n	7
87-65-0	2,6-Dichlorophenol													
120-83-2	2,4-Dichlorophenol							3.00E-03	I			46	n	
594-20-7	2, 2-Dichloropropane; isopropylidene chloride													
78-87-5	1,2-Dichloropropane; Propylene dichloride	V		3.70E-02	P	3.70E-06	P	4.00E-02	P	4.00E-03	I	0.85	c	5
142-28-9	1,3-Dichloropropane; Trimethylene dichloride	V						2.00E-02	P			370	n	
563-58-6	1,1-Dichloropropene													
60-57-1	Dieldrin			1.60E+01	I	4.60E-03	I	5.00E-05	I			0.0018	c	
84-66-2	Diethyl phthalate							8.00E-01	I			15000	n	
60-51-5	Dimethoate							2.20E-03	O			44	n	
131-11-3	Dimethyl phthalate													
57-97-6	7,12-Dimethylbenz[a]anthracene		M	2.50E+02	C	7.10E-02	C					0.0001	c	
119-93-7	3,3'-Dimethylbenzidine			1.10E+01	P							0.0065	c	
105-67-9	2,4-Dimethylphenol; m-Xylenol							2.00E-02	I			360	n	
84-74-2	Di-n-butyl phthalate							1.00E-01	I			900	n	
534-52-1	4,6-Dinitro-o-cresol; 4,6-Dinitro-2-methylphenol							8.00E-05	X			1.5	n	
51-28-5	2,4-Dinitrophenol							2.00E-03	I			39	n	
121-14-2	2,4-Dinitrotoluene			3.10E-01	C	8.90E-05	C	2.00E-03	I			0.24	c	
606-20-2	2,6-Dinitrotoluene			1.50E+00	P			3.00E-04	X			0.049	c	
117-84-0	Di-n-octyl phthalate							1.00E-02	P			200	n	
88-85-7	Dinoseb; DNBP; 2-sec-Butyl-4,6-dinitrophenol							1.00E-03	I			15	n	7
122-39-4	Diphenylamine							1.00E-01	O			1300	n	
298-04-4	Disulfoton							4.00E-05	I			0.5	n	
959-98-8	Endosulfan I	V												
33213-65-9	Endosulfan II	V												
1031-07-8	Endosulfan sulfate							6.00E-03	P			110	n	
72-20-8	Endrin							3.00E-04	I			2.3	n	2
7421-93-4	Endrin aldehyde													
97-63-2	Ethyl methacrylate	V								3.00E-01	P	630	n	
100-41-4	Ethylbenzene	V		1.10E-02	C	2.50E-06	C	5.00E-02	P	1.00E+00	I	1.5	c	700
62-50-0	Ethylmethanesulfonate													
52-85-7	Famphur													
206-44-0	Fluoranthene							4.00E-02	I			800	n	
86-73-7	Fluorene	V						4.00E-02	I			290	n	
58-89-9	gamma-BHC; Lindane			1.10E+00	C	3.10E-04	C	1.00E-05	A			0.042	c	0.2
76-44-8	Heptachlor	V		4.50E+00	I	1.30E-03	I	1.00E-04	A			0.0014	c	0.4
1024-57-3	Heptachlor epoxide	V		9.10E+00	I	2.60E-03	I	1.30E-05	I			0.0014	c	0.2
118-74-1	Hexachlorobenzene	V		1.60E+00	I	4.60E-04	I	1.00E-05	P			0.0098	c	1
87-68-3	Hexachlorobutadiene	V		7.80E-02	I	2.20E-05	I	1.00E-03	P			0.14	c	
77-47-4	Hexachlorocyclopentadiene	V						6.00E-03	I	2.00E-04	I	0.41	n	50

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67-72-1	Hexachloroethane	V		4.00E-02	I	1.10E-05	C	7.00E-04	I	3.00E-02	I	0.33	c	
1888-71-7	Hexachloropropene													
591-78-6	2-Hexanone; Methyl butyl ketone	V						5.00E-03	I	3.00E-02	I	38	n	
193-39-5	Indeno[1,2,3-cd]pyrene		M	1.00E-01	E	6.00E-05	E					0.25	c	
78-83-1	Isobutyl alcohol	V						3.00E-01	I			5900	n	
465-73-6	Isodrin													
78-59-1	Isophorone			9.50E-04	I			2.00E-01	I	2.00E+00	C	78	c	
120-58-1	Isosafrole													
143-50-0	Kepone			1.00E+01	I	4.60E-03	C	3.00E-04	I			0.0035	c	
7439-92-1	Lead (Total)											15	G	15
108-39-4	m-Cresol; 3-methyphenol							5.00E-02	I	6.00E-01	C	930	n	
541-73-1	m-Dichlorobenzene; 1,3-Dichlorobenzene	V												
99-65-0	m-Dinitrobenzene							1.00E-04	I			2	n	
7439-97-6	Mercury (Total)	V								3.00E-04	I	0.63	n	2
126-98-7	Methacrylonitrile	V						1.00E-04	I	3.00E-02	P	1.9	n	
91-80-5	Methapyrilene													
72-43-5	Methoxychlor							5.00E-03	I			37	n	40
74-83-9	Methyl bromide; Bromomethane	V						1.40E-03	I	5.00E-03	I	7.5	n	
74-87-3	Methyl chloride; Chloromethane	V								9.00E-02	I	190	n	
78-93-3	Methyl ethyl ketone; MEK; 2-Butanone	V						6.00E-01	I	5.00E+00	I	5600	n	
74-88-4	Methyl iodide; Iodomethane													
80-62-6	Methyl methacrylate	V						1.40E+00	I	7.00E-01	I	1400	n	
66-27-3	Methyl methanesulfonate			9.90E-02	C	2.80E-05	C					0.79	c	
298-00-0	Methyl parathion; Parathion methyl methyl							2.50E-04	I			4.5	n	
56-49-5	3-Methylcholanthrene		M	2.20E+01	C	6.30E-03	C					0.0011	c	
74-95-3	Methylene bromide; Dibromomethane	V								4.00E-03	X	8.3	n	
75-09-2	Methylene chloride; Dichloromethane	V	M	2.00E-03	I	1.00E-08	I	6.00E-03	I	6.00E-01	I	11	c	5
91-57-6	2-Methylnaphthalene	V						4.00E-03	I			36	n	
108-10-1	4-Methyl-2-pentanone; Methyl isobutyl ketone (MIBK)	V								3.00E+00	I	6300	n	
99-09-2	m-Nitroaniline; 3-Nitroaniline													
91-20-3	Naphthalene	V		1.20E-01	C	3.40E-05	C	2.00E-02	I	3.00E-03	I	0.12	c	
130-15-4	1,4-Naphthoquinone													
134-32-7	1- Naphthylamine													
91-59-8	2-Napthylamine			1.80E+00	C	0.00E+00	C					0.039	c	
7440-02-0	Nickel (Total)					2.60E-04	C	2.00E-02	I	9.00E-05	A	390	n	
98-95-3	Nitrobenzene	V				4.00E-05	I	2.00E-03	I	9.00E-03	I	0.14	c	
99-55-8	5-Nitro-o-toluidine			9.00E-03	P			2.00E-02	X			8.2	c	
55-18-5	N-Nitrosodiethylamine		M	1.50E+02	I	4.30E-02	I					0.00017	c	
62-75-9	N-Nitrosodimethylamine	V	M	5.10E+01	I	1.40E-02	I	8.00E-06	P	4.00E-05	X	0.00011	c	
924-16-3	N-Nitrosodi-n-butylamine	V		5.40E+00	I	1.60E-03	I					0.0027	c	
86-30-6	N-Nitrosodiphenylamine			4.90E-03	I	2.60E-06	C					12	c	
621-64-7	N-Nitrosodipropylamine; N-Nitroso-N-dipropylamine; Di-n-propylnitrosami			7.00E+00	I	2.00E-03	C					0.011	c	
10595-95-6	N-Nitrosomethylethalamine	V		2.20E+01	I	6.30E-03	C					0.00071	c	

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100-75-4	N-Nitrosopiperidine			9.40E+00	C	2.70E-03	C					0.0082	c	
930-55-2	N-Nitrosopyrrolidine			2.10E+00	I	6.10E-04	I					0.037	c	
95-48-7	o-Cresol; 2-methyphenol							5.00E-02	I	6.00E-01	C	930	n	
95-50-1	o-Dichlorobenzene; 1,2-Dichlorobenzene	V						9.00E-02	I	2.00E-01	H	300	n	600
88-74-4	o-Nitroaniline; 2-Nitroaniline							1.00E-02	X	5.00E-05	X	190	n	
88-75-5	o-Nitrophenol; 2-Nitrophenol													
297-97-2	O,O-Diethyl O-2-pyrazinyl phosphorothioate; Thionazin													
126-68-1	O,O,O-Triethyl phosphorothioate													
95-53-4	o-Toluidine			1.60E-02	P	5.10E-05	C					4.7	c	
56-38-2	Parathion							6.00E-03	H			86	n	
106-47-8	p-Chloroaniline			2.00E-01	P			5.00E-04	P			0.37	c	
59-50-7	p-Chloro-m-cresol; 4-Chloro-3-methylphenol							1.00E-01	A			1400	n	
106-44-5	p-Cresol; 4-methyphenol							2.00E-02	P	6.00E-01	C	370	n	
106-46-7	p-Dichlorobenzene; 1,4-Dichlorobenzene	V		5.40E-03	C	1.10E-05	C	7.00E-02	A	8.00E-01	I	0.48	c	75
60-11-7	p-(Dimethylamino)azobenzene			4.60E+00	C	1.30E-03	C					0.005	c	
608-93-5	Pentachlorobenzene	V						8.00E-04	I			3.2	n	
82-68-8	Pentachloronitrobenzene	V		2.60E-01	H			3.00E-03	I			0.12	c	
87-86-5	Pentachlorophenol			4.00E-01	I	5.10E-06	C	5.00E-03	I			0.041	c	1
62-44-2	Phenacetin			2.20E-03	C	6.30E-07	C					34	c	
85-01-8	Phenanthrene	V												
108-95-2	Phenol							3.00E-01	I	2.00E-01	C	5800	n	
298-02-2	Phorate							2.00E-04	H			3	n	
100-01-6	p-Nitroaniline; 4-Nitroaniline			2.00E-02	P			4.00E-03	P	6.00E-03	P	3.8	c	
100-02-7	p-Nitrophenol; 4-Nitrophenol													
1336-36-3	Polychlorinated biphenyls; PCBS; Aroclors	V		2.00E+00	I	5.70E-04	I							0.5
106-50-3	p-Phenylenediamine							1.00E-03	X			20	n	
23950-58-5	Pronamide							7.50E-02	I			1200	n	
107-12-0	Propionitrile; Ethyl cyanide													
129-00-0	Pyrene	V						3.00E-02	I			120	n	
94-59-7	Safrole		M	2.20E-01	C	6.30E-05	C					0.096	c	
7782-49-2	Selenium (Total)							5.00E-03	I	2.00E-02	C	100	n	50
7440-22-4	Silver (Total)							5.00E-03	I			94	n	
93-72-1	Silvex; 2,4,5-TP							8.00E-03	I			110	n	50
100-42-5	Styrene	V						2.00E-01	I	1.00E+00	I	1200	n	100
18496-25-8	Sulfide													
99-35-4	sym-Trinitrobenzene							3.00E-02	I			590	n	
93-76-5	2,4,5-T; 2,4,5-Trichlorophenoxyacetic acid							1.00E-02	I			160	n	
95-94-3	1,2,4,5-Tetrachlorobenzene	V						3.00E-05	P			0.17	n	
630-20-6	1,1,1,2-Tetrachloroethane	V		2.60E-02	I	7.40E-06	I	3.00E-02	I			0.57	c	
79-34-5	1,1,2,2-Tetrachloroethane	V		2.00E-01	I	5.80E-05	C	2.00E-02	I			0.076	c	
127-18-4	Tetrachloroethylene; Tetrachloroethene; Perchloroethylene	V		2.10E-03	I	2.60E-07	I	6.00E-03	I	4.00E-02	I	11	c	5
58-90-2	2,3,4,6-Tetrachlorophenol							3.00E-02	I			240	n	
7440-28-0	Thallium (Total)							1.00E-05	X			0.2	n	2

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7440-31-5	Tin (Total)							6.00E-01	H			12000	n	
108-88-3	Toluene	V						8.00E-02	I	5.00E+00	I	1100	n	1000
8001-35-2	Toxaphene			1.10E+00	I	3.20E-04	I	9.00E-05	P			0.071	c	3
110-57-6	trans-1,4-Dichloro-2-butene	V				4.20E-03	P					0.0013	c	
156-60-5	trans-1,2-Dichloroethylene; trans-1,2-Dichroroethene	V						2.00E-02	I	4.00E-02	X	68	n	100
10061-02-6	trans-1,3-Dichloropropene	V												
120-82-1	1,2,4-Trichlorobenzene	V		2.90E-02	P			1.00E-02	I	2.00E-03	P	1.2	c	70
79-00-5	1,1,2-Trichloroethane	V		5.70E-02	I	1.60E-05	I	4.00E-03	I	2.00E-04	X	0.28	c	5
71-55-6	1,1,1-Trichloroethane; Methychloroform	V						2.00E+00	I	5.00E+00	I	8000	n	200
79-01-6	Trichloroethylene; Trichloroethene ethane	V	M	4.60E-02	I	4.10E-06	I	5.00E-04	I	2.00E-03	I	0.49	c	5
75-69-4	Trichlorofluoromethane; CFC-11	V						3.00E-01	I			5200	n	
95-95-4	2,4,5-Trichlorophenol							1.00E-01	I			1200	n	
88-06-2	2,4,6-Trichlorophenol			1.10E-02	I	3.10E-06	I	1.00E-03	P			4.1	c	
96-18-4	1,2,3-Trichloropropane	V	M	3.00E+01	I			4.00E-03	I	3.00E-04	I	0.00075	c	
7440-62-2	Vanadium (Total)							5.00E-03	G	1.00E-04	A	86	n	
108-05-4	Vinyl acetate	V						1.00E+00	H	2.00E-01	I	410	n	
75-01-4	Vinyl chloride; Chloroethene	V	M	7.20E-01	I	4.40E-06	I	3.00E-03	I	8.00E-02	A	0.019	c	2
1330-20-7	Xylene (Total)	V						2.00E-01	I	1.00E-01	I	190	n	10000
7440-66-6	Zinc (Total)							3.00E-01	I			6000	n	

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Refer to ACL release memo and/or Virginia DEQ for additional information.

MCL, when available, supersedes ACL.

ACL Constituents are listed by common names found in 9VAC20-81-250 Table 3.1 and are widely used in government regulations, scientific publications, and commerce; synonyms exist for many chemicals. CAS numbers are provided as unique chemical identifiers.

Constituents without ACL value do not have a toxicity value or other inputs to develop an ACL at this time.

For constituents where (Total) is noted, all species in the groundwater that contains this element are included.

Bis(2-chloro-1-methylethyl) ether; 2, 2'-dichlorodiisopropyl ether; DCIP (CAS RN 108-60-1) is often called bis(2-chloroisopropyl) ether, the name Chemical Abstracts Service applies to its noncommercial isomer, propane, 2.2'-oxybis2-chloro (CAS RN 39638-32-9).

Chlordane includes alpha-chlordane (CAS RN 5103-71-9), beta-chlordane (CAS RN 5103-74-2), gamma-chlordane (CAS RN 5566-34-7), and constituents of chlordane (CAS RN 57-74-9 and CAS RN 12739-03-6).

The term chlordane in association with CAS RN 57-74-9 refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components. For issues related to chlordane contact Virginia DEQ Solid Waste.

Copper (CAS RN 7440-50-8) and lead (CAS RN 7439-92-1) do not have an MCL but have an “action level” based on treatment technology. For setting the ground water protection standard (GPS), these action levels are treated as MCLs.

Polychlorinated biphenyls (PCBs) (CAS RN 1336-36-3) contains congener chemicals, including constituents of aroclor 1016 (CAS RN 12674-11-2), aroclor 1221 (CAS RN 11104-28-2), aroclor 1232 (CAS RN 11141-16-5), aroclor 1242 (CAS RN 53469-21-9), aroclor 1248 (CAS RN 12672-29-6), aroclor 1254 (CAS RN 11097-69-1), and aroclor 1260 (CAS RN 11096-82-5).

Individual constituents of THMs (dibromochloromethane, CAS RN: 124-48-1; chloroform, CAS RN: 67-66-3; bromoform, CAS RN: 75-25-2; bromodichloromethane, CAS RN: 75-27-4) have a listed MCL of 80 µg/L. However, this MCL is for TOTAL THMs.

The MCL provided for individual THMs may ONLY be used as the MCL for total THMs provided the sum of detected THM concentrations plus the detection limits for nondetects is below the total THM MCL value of 80µg/L.

Toxaphene includes congener chemicals contained in technical toxaphene (CAS RN 8001-35-2), i.e., chlorinated camphene.

Xylene (Total) includes o-xylene (CAS RN 96-47-6), m-xylene (CAS RN 108-38-3), p-xylene (CAS RN 106-42-3), and unspecified xylenes (dimethylbenzenes) (CAS RN 1330-20-7).

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = OW; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; c = cancer; n = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded; V = volatile; M = mutagen.

Toxicity and Chemical-specific Information																		Contaminant		Screening Levels												Protection of Groundwater SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tap Water (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
				3.0E-04	O					1	0.1		Acephate	30560-19-1	1.9E+01	n	2.5E+02	n					6.0E+00	n		1.3E-03	n	
		2.2E-06	I			9.0E-03	I	V		1		1.1E+05	Acetaldehyde	75-07-0	1.1E+01	c**	4.9E+01	c**	1.3E+00	c**	5.6E+00	c**	2.6E+00	c**		5.2E-04	c**	
				2.0E-02	I					1	0.1		Acetochlor	34256-82-1	1.3E+03	n	1.6E+04	n					3.5E+02	n		2.8E-01	n	
				9.0E-01	I			V		1		1.1E+05	Acetone	67-64-1	7.0E+04	n	1.1E+06	nms					1.8E+04	n		3.7E+00	n	
						2.0E-03	X			1	0.1		Acetone Cyanohydrin	75-86-5	2.8E+06	nm	1.2E+07	nm	2.1E+00	n	8.8E+00	n						
						6.0E-02	I	V		1		1.3E+05	Acetonitrile	75-05-8	8.1E+02	n	3.4E+03	n	6.3E+01	n	2.6E+02	n	1.3E+02	n		2.6E-02	n	
				1.0E-01	I			V		1		2.5E+03	Acetophenone	98-86-2	7.8E+03	ns	1.2E+05	nms					1.9E+03	n		5.8E-01	n	
3.8E+00	C	1.3E-03	C							1	0.1		Acetylaminofluorene, 2-	53-96-3	1.4E-01	c	6.0E-01	c	2.2E-03	c	9.4E-03	c	1.6E-02	c		7.5E-05	c	
				5.0E-04	I	2.0E-05	I	V		1		2.3E+04	Acrolein	107-02-8	1.4E-01	n	6.0E-01	n	2.1E-02	n	8.8E-02	n	4.2E-02	n		8.4E-06	n	
5.0E-01	I	1.0E-04	I	2.0E-03	I	6.0E-03	I		M	1	0.1		Acrylamide	79-06-1	2.4E-01	c	4.6E+00	c	1.0E-02	c	1.2E-01	c	5.0E-02	c		1.1E-05	c	
				5.0E-01	I	2.0E-04	P	V		1		1.1E+05	Acrylic Acid	79-10-7	2.0E+01	n	8.3E+01	n	2.1E-01	n	8.8E-01	n	4.2E-01	n		8.5E-05	n	
5.4E-01	I	6.8E-05	I	1.0E-02	A	2.0E-03	I	V		1		1.1E+04	Acrylonitrile	107-13-1	2.5E-01	c*	1.1E+00	c*	4.1E-02	c*	1.8E-01	c*	5.2E-02	c*		1.1E-05	c*	
						6.0E-03	P			1	0.1		Adiponitrile	111-69-3	8.5E+06	nm	3.6E+07	nm	6.3E+00	n	2.6E+01	n						
5.6E-02	C			1.0E-02	I					1	0.1		Alachlor	15972-60-8	9.7E+00	c*	4.1E+01	c					1.1E+00	c	2.0E+00	8.7E-04	c	1.6E-03
				1.0E-03	I					1	0.1		Aldicarb	116-06-3	6.3E+01	n	8.2E+02	n					2.0E+01	n	3.0E+00	4.9E-03	n	7.5E-04
				1.0E-03	I					1	0.1		Aldicarb Sulfone	1646-88-4	6.3E+01	n	8.2E+02	n					2.0E+01	n	2.0E+00	4.4E-03	n	4.4E-04
										1	0.1		Aldicarb sulfoxide	1646-87-3											4.0E+00			8.8E-04
1.7E+01	I	4.9E-03	I	3.0E-05	I			V		1			Aldrin	309-00-2	3.9E-02	c*	1.8E-01	c	5.7E-04	c	2.5E-03	c	9.2E-04	c		1.5E-04	c	
				4.0E-03	P	1.0E-04	X	V		1		1.1E+05	Allyl Alcohol	107-18-6	3.5E+00	n	1.5E+01	n	1.0E-01	n	4.4E-01	n	2.1E-01	n		4.2E-05	n	
2.1E-02	C	6.0E-06	C			1.0E-03	I	V		1		1.4E+03	Allyl Chloride	107-05-1	7.2E-01	c**	3.2E+00	c**	4.7E-01	c**	2.0E+00	c**	7.3E-01	c**		2.3E-04	c**	
				1.0E+00	P	5.0E-03	P			1			Aluminum	7429-90-5	7.7E+04	n	1.1E+06	nm	5.2E+00	n	2.2E+01	n	2.0E+04	n		3.0E+04	n	
				4.0E-04	I					1			Aluminum Phosphide	20859-73-8	3.1E+01	n	4.7E+02	n					8.0E+00	n				
				9.0E-03	I					1	0.1		Ametryn	834-12-8	5.7E+02	n	7.4E+03	n					1.5E+02	n		1.6E-01	n	
2.1E+01	C	6.0E-03	C							1	0.1		Aminobiphenyl, 4-	92-67-1	2.6E-02	c	1.1E-01	c	4.7E-04	c	2.0E-03	c	3.0E-03	c		1.5E-05	c	
				8.0E-02	P					1	0.1		Aminophenol, m-	591-27-5	5.1E+03	n	6.6E+04	n					1.6E+03	n		6.1E-01	n	
				4.0E-03	X					1	0.1		Aminophenol, o-	95-55-6	2.5E+02	n	3.3E+03	n					7.9E+01	n		3.0E-02	n	
				2.0E-02	P					1	0.1		Aminophenol, p-	123-30-8	1.3E+03	n	1.6E+04	n					4.0E+02	n		1.5E-01	n	
				2.5E-03	I					1	0.1		Amitraz	33089-61-1	1.6E+02	n	2.1E+03	n					8.2E+00	n		4.2E+00	n	
						5.0E-01	I	V		1			Ammonia	7664-41-7					5.2E+02	n	2.2E+03	n						
				2.0E-03	X					1	0.1		Ammonium Picrate	131-74-8	1.3E+02	n	1.6E+03	n					4.0E+01	n		1.9E-01	n	
				2.0E-01	I					1			Ammonium Sulfamate	7773-06-0	1.6E+04	n	2.3E+05	nm					4.0E+03	n				
						3.0E-03	X	V		1		1.4E+04	Amyl Alcohol, tert-	75-85-4	8.2E+01	n	3.4E+02	n	3.1E+00	n	1.3E+01	n	6.3E+00	n		1.3E-03	n	
5.7E-03	I	1.6E-06	C	7.0E-03	P	1.0E-03	I			1	0.1		Aniline	62-53-3	9.5E+01	c*	4.0E+02	c*	1.0E+00	n	4.4E+00	n	1.3E+01	c*		4.6E-03	c*	
4.0E-02	P			2.0E-03	X					1	0.1		Anthraquinone, 9,10-	84-65-1	1.4E+01	c**	5.7E+01	c*					1.4E+00	c*		1.4E-02	c*	
				4.0E-04	I	3.0E-04	A			0.15			Antimony (metallic)	7440-36-0	3.1E+01	n	4.7E+02	n	3.1E-01	n	1.3E+00	n	7.8E+00	n	6.0E+00	3.5E-01	n	2.7E-01
				5.0E-04	H					0.15			Antimony Pentoxide	1314-60-9	3.9E+01	n	5.8E+02	n					9.7E+00	n				
				4.0E-04	H					0.15			Antimony Tetroxide	1332-81-6	3.1E+01	n	4.7E+02	n					7.8E+00	n				
						2.0E-04	I			0.15			Antimony Trioxide	1309-64-4	2.8E+05	nm	1.2E+06	nm	2.1E-01	n	8.8E-01	n						
1.5E+00	I	4.3E-03	I	3.0E-04	I	1.5E-05	C			1	0.03		Arsenic, Inorganic	7440-38-2	6.8E-01	c*G	3.0E+00	cG	6.5E-04	c*	2.9E-03	c*	5.2E-02	c	1.0E+01	1.5E-03	c	2.9E-01
				3.5E-06	C	5.0E-05	I			1			Arsine	7784-42-1	2.7E-01	n	4.1E+00	n	5.2E-02	n	2.2E-01	n	7.0E-02	n				
										1			Asbestos (units in fibers)	1332-21-4											7.0E+06(G)			
				3.6E-01	O					1	0.1		Asulam	3337-71-1	2.3E+04	n	3.0E+05	nm					7.2E+03	n		1.8E+00	n	
2.3E-01	C			3.0E-03	A					1	0.1		Atrazine	1912-24-9	2.4E+00	c*	1.0E+01	c					3.0E-01	c	3.0E+00	2.0E-04	c	1.9E-03
8.8E-01	C	2.5E-04	C							1	0.1		Auramine	492-80-8	6.2E-01	c	2.6E+00	c	1.1E-02	c	4.9E-02	c	7.8E-02	c		7.1E-04	c	
				4.0E-04	I					1	0.1		Avermectin B1	65195-55-3	2.5E+01	n	3.3E+02	n					8.0E+00	n		1.4E+01	n	
				3.0E-03	A	1.0E-02	A			1	0.1		Azinphos-methyl	86-50-0	1.9E+02	n	2.5E+03	n	1.0E+01	n	4.4E+01	n	5.6E+01	n		1.7E-02	n	
1.1E-01	I	3.1E-05	I					V		1			Azobenzene	103-33-3	5.6E+00	c	2.6E+01	c	9.1E-02	c	4.0E-01	c	1.2E-01	c		9.3E-04	c	
				1.0E+00	P	7.0E-06	P			1	0.1		Azodicarbonamide	123-77-3	8.6E+03	n	4.0E+04	n	7.3E-03	n	3.1E-02	n	2.0E+04	n		6.8E+00	n	
				2.0E-01	I	5.0E-04	H			0.07			Barium	7440-39-3	1.5E+04	n	2.2E+05	nm	5.2E-01	n	2.2E+00	n	3.8E+03	n	2.0E+03	1.6E+02	n	8.2E+01
				5.0E-03	O			V		1			Benfluralin	1861-40-1	3.9E+02	n	5.8E+03	n					2.8E+01	n		9.4E-01	n	
				5.0E-02	I					1	0.1		Benomyl	17804-35-2	3.2E+03	n	4.1E+04	n					9.7E+02	n		8.5E-01	n	
				2.0E-01	I					1	0.1		Bensulfuron-methyl	83055-99-6	1.3E+04	n	1.6E+05	nm					3.9E+03	n		1.0E+00	n	
				3.0E-02	I					1	0.1		Bentazon	25057-89-0	1.9E+03	n	2.5E+04	n					5.7E+02	n		1.2E-01	n	
4.0E-03	P			1.0E-01	I			V		1		1.2E+03	Benzaldehyde	100-52-7	1.7E+02	c*	8.2E+02	c					1.9E+01	c		4.1E-03	c	
5.5E-02	I	7.8E-06	I	4.0E-03	I	3.0E-02	I	V		1		1.8E+03	Benzene	71-43-2	1.2E+00	c*	5.1E+00	c*	3.6E-01	c*	1.6E+00	c*	4.6E-01	c*	5.0E+00	2.3E-04	c*	2.6E-03
1.0E-01	X			3.0E-04	X					1	0.1		Benzenediamine-2-methyl sulfate, 1,4-	6369-59-1	5.4E+00	c**	2.3E+01	c*					7.8E-01	c**		2.2E-04	c**	
				1.0E-03	P			V		1		1.3E+03	Benzenethiol	108-98-5	7.8E+01	n	1.2E+03	n					1.7E+01	n		1.1E-02	n	
2.3E+02	I	6.7E-02	I	3.0E-03	I				M	1	0.1		Benzidine	92-87-5	5.3E-04	c	1.0E-02	c	1.5E-05	c	1.8E-04	c	1.1E-04	c		2.8E-07	c	
				4.0E+00	I					1	0.1		Benzoic Acid	65-85-0	2.5E+05	nm	3.3E+06	nm					7.5E+04	n		1.5E+01	n	
1.3E+01	I							V		1		3.2E+02	Benzotrichloride	98-07-7	5.3E-02	c	2.5E-01	c					3.0E-03	c		6.6E-06	c	
				1.0E-01	P					1	0.1		Benzyl Alcohol	100-51-6	6.3E+03	n	8.2E+04	n					2.0E+03	n		4.8E-01	n	
1.7E-01	I	4.9E-05	C	2.0E-03	P	1.0E-03	P	V		1		1.5E+03	Benzyl Chloride	100-44-7	1.1E+00	c*	4.8E+00	c*	5.7E-02	c*	2.5E-01	c*	8.9E-02	c*		9.8E-05	c*	
		2.4E-03	I	2.0E-03	I	2.0E-05	I			0.007			Beryllium and compounds	7440-41-7	1.6E+02	n	2.3E+03	n	1.2E-03	c*	5.1E-03	c*	2.5E+01	n	4.0E+00	1.9E+01	n	3.2E+00
				9.0E-03	P					1	0.1		Bifenox	42576-02-3	5.7E+02	n	7.4E+03	n					1.0E+02	n		7.6E-01	n	
				1.5E-02	I					1	0.1		Biphenthrin	82657-04-3	9.5E+02	n	1.2E+04	n					3.0E+02	n		1.4E+03	n	
8.0E-03	I			5.0E-01	I	4.0E-04	X	V		1			Biphenyl, 1,1'-	92-52-4	4.7E+01	n	2.0E+02	n	4.2E-01	n	1.8E+00	n	8.3E-01	n		8.7E-03	n	
				4.0E-02	I			V		1		1.0E+03	Bis(2-chloro-1-methylethyl) ether	108-60-1	3.1E+03	ns	4.7E+04	ns					7.1E+02	n		2.6E-01	n	
				3.0E-03	P					1	0.1		Bis(2-chloroethoxy)methane	111-91-1	1.9E+02	n	2.5E+03	n					5.9E+01	n		1.3E-02	n	
1.1E+00	I	3.3E-04	I					V		1		5.1E+03	Bis(2-chloroethyl)ether	111-44-4	2.3E-01	c	1.0E+00	c	8.5E-03	c	3.7E-02	c	1.4E-02	c		3.6E-06	c	
2.2E+02	I	6.2E-02	I					V		1		4.2E+03	Bis(chloromethyl)ether	542-88-1	8.3E-05	c	3.6E-04	c	4.5E-05	c	2.0E-04	c	7.2E-05	c		1.7E-08	c	
				5.0E-02	I					1	0.1		Bisphenol A	80-05-7	3.2E+03	n	4.1E+04	n					7.7E+02	n		5.8E+01	n	
				2.0E-01	I	2.0E-02	H			1			Boron And Borates Only	7440-42-8	1.6E+04	n	2.3E+05	nm	2.1E+01	n	8.8E+01	n	4.0E+03	n		1.3E+01	n	
				2.0E+00	P	2.0E-02	P	V		1			Boron Trichloride	10294-34-5	1.6E+05	nm	2.3E+06	nm	2.1E+01	n	8.8E+01	n	4.2E+01	n				
				4.0E-02	C	1.3E-02	C	V		1			Boron Trifluoride	7637-07-2	3.1E+03	n	4.7E+04	n	1.4E+01	n	5.7E+01	n	2.6E+01	n				
7.0E-01	I	1.4E-04	C	4.0E-03	I					1			Bromate	15541-45-4	9.9E-01	c	4.7E+00	c	2.0E-02	c	8.8E-02	c	1.1E-01	c	1.0E+01	8.5E-04	c	7.7E-02
				1.0E-04	X	6.0E-05	X	V		1		2.4E+03	Bromo-2-chloroethane, 1-	107-04-0	3.5E-01	n	1.5E+00	n	6.3E-02	n	2.6E-01	n	1.2E-01	n		3.3E-05	n	
				3.0E-04	X			V		1		9.0E+02	Bromo-3-fluorobenzene, 1-	1073-06-9	2.3E+01	n	3.5E+02	n					4.9E+00	n		4.7E-03	n	
				3.0E-04	X			V		1		3.2E+02	Bromo-4-fluorobenzene, 1-	460-00-4	2.3E+01	n	3.5E+02	ns					4.6E+00	n		4.4E-03	n	

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = OW; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; c = cancer; n = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded; V = volatile; M = mutagen.

Toxicity and Chemical-specific Information														Contaminant		Screening Levels											Protection of Groundwater SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tap Water (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
				1.7E-03	C					1	0.1		Bromoacetic acid	79-08-3	1.1E+02	n	1.4E+03	n					3.4E+01	n	6.0E+01(G)	6.9E-03	n	1.2E-02
				8.0E-03	I	6.0E-02	I	V		1		6.8E+02	Bromobenzene	108-86-1	2.9E+02	n	1.8E+03	ns	6.3E+01	n	2.6E+02	n	6.2E+01	n		4.2E-02	n	
						4.0E-02	X	V		1		4.0E+03	Bromochloromethane	74-97-5	1.5E+02	n	6.3E+02	n	4.2E+01	n	1.8E+02	n	8.3E+01	n		2.1E-02	n	
6.2E-02	I	3.7E-05	C	8.0E-03	P			V		1		9.3E+02	Bromodichloromethane	75-27-4	2.9E-01	c	1.3E+00	c	7.6E-02	c	3.3E-01	c	1.3E-01	c	8.0E+01(G)	3.6E-05	c	2.2E-02
7.9E-03	I	1.1E-06	I	2.0E-02	I			V		1		9.2E+02	Bromoform	75-25-2	1.9E+01	c*	8.6E+01	c	2.6E+00	c	1.1E+01	c	3.3E+00	c	8.0E+01(G)	8.7E-04	c	2.1E-02
				1.4E-03	I	5.0E-03	I	V		1		3.6E+03	Bromomethane	74-83-9	6.8E+00	n	3.0E+01	n	5.2E+00	n	2.2E+01	n	7.5E+00	n		1.9E-03	n	
				5.0E-03	H			V		1			Bromophos	2104-96-3	3.9E+02	n	5.8E+03	n					3.5E+01	n		1.5E-01	n	
		3.7E-06	C			1.0E-01	A	V		1		9.7E+02	Bromopropane, 1-	106-94-5	1.6E+00	c	7.1E+00	c	7.6E-01	c	3.3E+00	c	1.5E+00	c		4.6E-04	c	
1.0E-01	O			1.5E-02	O					1	0.1		Bromoxynil	1689-84-5	5.3E+00	c	2.2E+01	c					6.1E-01	c		5.2E-04	c	
1.0E-01	O			1.5E-02	O			V		1			Bromoxynil Octanoate	1689-99-2	6.7E+00	c	3.2E+01	c					2.4E-01	c		2.1E-03	c	
6.0E-01	C	3.0E-05	I			2.0E-03	I	V		1		6.7E+02	Butadiene, 1,3-	106-99-0	7.6E-02	c*	3.3E-01	c*	9.4E-02	c*	4.1E-01	c*	7.1E-02	c*		3.9E-05	c*	
				1.0E-01	I			V		1		7.6E+03	Butanol, N-	71-36-3	7.8E+03	ns	1.2E+05	nms					2.0E+03	n		4.1E-01	n	
5.0E-04	I			4.0E-01	I	5.0E+00	I	V		1			Butyl Alcohol, t-	75-65-0	1.4E+03	c*	6.5E+03	c*	5.2E+03	n	2.2E+04	n	1.5E+02	c*		3.2E-02	c*	
				2.0E+00	P	3.0E+01	P	V		1		2.1E+04	Butyl alcohol, sec-	78-92-2	1.3E+05	nms	1.5E+06	nms	3.1E+04	n	1.3E+05	n	2.4E+04	n		5.0E+00	n	
				5.0E-02	I			V		1			Butylate	2008-41-5	3.9E+03	n	5.8E+04	n					4.6E+02	n		4.5E-01	n	
2.0E-04	C	5.7E-08	C							1	0.1		Butylated hydroxyanisole	25013-16-5	2.7E+03	c	1.1E+04	c	4.9E+01	c	2.2E+02	c	1.5E+02	c		2.9E-01	c	
3.6E-03	P			3.0E-01	P					1	0.1		Butylated hydroxytoluene	128-37-0	1.5E+02	c	6.4E+02	c					3.4E+00	c		1.0E-01	c	
				5.0E-02	P			V		1		1.1E+02	Butylbenzene, n-	104-51-8	3.9E+03	ns	5.8E+04	ns					1.0E+03	n		3.2E+00	n	
				1.0E-01	X			V		1		1.5E+02	Butylbenzene, sec-	135-98-8	7.8E+03	ns	1.2E+05	nms					2.0E+03	n		5.9E+00	n	
				1.0E-01	X			V		1		1.8E+02	Butylbenzene, tert-	98-06-6	7.8E+03	ns	1.2E+05	nms					6.9E+02	n		1.6E+00	n	
				2.0E-02	A					1	0.1		Cacodylic Acid	75-60-5	1.3E+03	n	1.6E+04	n					4.0E+02	n		1.1E-01	n	
		1.8E-03	I	1.0E-04	A	1.0E-05	A			0.025	0.001		Cadmium (Diet)	7440-43-9	7.1E+00	n	1.0E+02	n	1.6E-03	c**	6.8E-03	c**						
		1.8E-03	I	1.0E-04	A	1.0E-05	A			0.05	0.001		Cadmium (Water)	7440-43-9					1.6E-03	c**	6.8E-03	c**	1.8E+00	n	5.0E+00	1.4E-01	n	3.8E-01
				5.0E-01	I	2.2E-03	C			1	0.1		Caprolactam	105-60-2	3.1E+04	n	4.0E+05	nm	2.3E+00	n	9.6E+00	n	9.9E+03	n		2.5E+00	n	
1.5E-01	C	4.3E-05	C	2.0E-03	I					1	0.1		Captafol	2425-06-1	3.6E+00	c*	1.5E+01	c	6.5E-02	c	2.9E-01	c	4.0E-01	c*		7.1E-04	c*	
2.3E-03	C	6.6E-07	C	1.3E-01	I					1	0.1		Captan	133-06-2	2.4E+02	c*	1.0E+03	c	4.3E+00	c	1.9E+01	c	3.1E+01	c*		2.2E-02	c*	
				1.0E-01	I					1	0.1		Carbaryl	63-25-2	6.3E+03	n	8.2E+04	n					1.8E+03	n		1.7E+00	n	
				5.0E-03	I					1	0.1		Carbofuran	1563-66-2	3.2E+02	n	4.1E+03	n					9.4E+01	n	4.0E+01	3.7E-02	n	1.6E-02
				1.0E-01	I	7.0E-01	I	V		1		7.4E+02	Carbon Disulfide	75-15-0	7.7E+02	ns	3.5E+03	ns	7.3E+02	n	3.1E+03	n	8.1E+02	n		2.4E-01	n	
7.0E-02	I	6.0E-06	I	4.0E-03	I	1.0E-01	I	V		1		4.6E+02	Carbon Tetrachloride	56-23-5	6.5E-01	c	2.9E+00	c	4.7E-01	c	2.0E+00	c	4.6E-01	c	5.0E+00	1.8E-04	c	1.9E-03
						1.0E-01	P	V		1		5.9E+03	Carbonyl Sulfide	463-58-1	6.7E+01	n	2.8E+02	n	1.0E+02	n	4.4E+02	n	2.1E+02	n		5.1E-01	n	
				1.0E-02	I					1	0.1		Carbosulfan	55285-14-8	6.3E+02	n	8.2E+03	n					5.1E+01	n		1.2E+00	n	
				1.0E-01	I					1	0.1		Carboxin	5234-68-4	6.3E+03	n	8.2E+04	n					1.9E+03	n		1.0E+00	n	
						9.0E-04	I			1			Ceric oxide	1306-38-3	1.3E+06	nm	5.4E+06	nm	9.4E-01	n	3.9E+00	n						
				1.0E-01	I			V		1			Chloral Hydrate	302-17-0	7.8E+03	n	1.2E+05	nm					2.0E+03	n		4.0E-01	n	
				1.5E-02	I					1	0.1		Chloramben	133-90-4	9.5E+02	n	1.2E+04	n					2.9E+02	n		7.0E-02	n	
										1	0.1		Chloramines, Organic	E701235											4.0E+03(G)			
4.0E-01	H									1	0.1		Chloranil	118-75-2	1.3E+00	c	5.7E+00	c					1.8E-01	c		1.5E-04	c	
				5.0E-04	G			V		1	0.04		Chlordane (alpha)	5103-71-9	3.6E+01	n	5.0E+02	n					3.6E+00	n		4.9E-01	n	
				5.0E-04	G			V		1	0.04		Chlordane (gamma)	5103-74-2	3.6E+01	n	5.0E+02	n					1.0E+01	n		1.4E+00	n	
3.5E-01	I	1.0E-04	I	5.0E-04	I	7.0E-04	I	V		1	0.04		Chlordane (technical mixture)	12789-03-6	1.7E+00	c*	7.7E+00	c*	2.8E-02	c*	1.2E-01	c*	2.0E-02	c*	2.0E+00	2.7E-03	c*	2.7E-01
1.0E+01	I	4.6E-03	C	3.0E-04	I					1	0.1		Chlordecone (Kepone)	143-50-0	5.4E-02	c	2.3E-01	c	6.1E-04	c	2.7E-03	c	3.5E-03	c		1.2E-04	c	
				7.0E-04	A					1	0.1		Chlorfenvinphos	470-90-6	4.4E+01	n	5.7E+02	n					1.1E+01	n		3.1E-02	n	
				9.0E-02	O					1	0.1		Chlorimuron, Ethyl-	90982-32-4	5.7E+03	n	7.4E+04	n					1.8E+03	n		6.0E-01	n	
				1.0E-01	I	1.5E-04	A	V		1		2.8E+03	Chlorine	7782-50-5	1.8E-01	n	7.8E-01	n	1.5E-01	n	6.4E-01	n	3.0E-01	n	4.0E+03(G)	1.5E-04	n	2.0E+00
				3.0E-02	I	2.0E-04	I	V		1			Chlorine Dioxide	10049-04-4	2.3E+03	n	3.4E+04	n	2.1E-01	n	8.8E-01	n	4.2E-01	n	8.0E+02(G)			
				3.0E-02	I					1			Chlorite (Sodium Salt)	7758-19-2	2.3E+03	n	3.5E+04	n					6.0E+02	n	1.0E+03			
						5.0E+01	I	V		1		1.2E+03	Chloro-1,1-difluoroethane, 1-	75-68-3	5.4E+04	ns	2.3E+05	nms	5.2E+04	n	2.2E+05	n	1.0E+05	n		5.2E+01	n	
		3.0E-04	I	2.0E-02	H	2.0E-02	I	V		1		7.9E+02	Chloro-1,3-butadiene, 2- (Chloroprene)	126-99-8	1.0E-02	c	4.4E-02	c	9.4E-03	c	4.1E-02	c	1.9E-02	c		9.8E-06	c	
4.6E-01	H									1	0.1		Chloro-2-methylaniline HCl, 4-	3165-93-3	1.2E+00	c	5.0E+00	c					1.7E-01	c		1.5E-04	c	
1.0E-01	P	7.7E-05	C	3.0E-03	X					1	0.1		Chloro-2-methylaniline, 4-	95-69-2	5.4E+00	c*	2.3E+01	c	3.6E-02	c	1.6E-01	c	7.0E-01	c*		4.0E-04	c*	
2.7E-01	X							V		1		1.2E+04	Chloroacetaldehyde, 2-	107-20-0	2.6E+00	c	1.2E+01	c					2.9E-01	c		5.8E-05	c	
				3.5E-03	C					1	0.1		Chloroacetic Acid	79-11-8	2.2E+02	n	2.9E+03	n					7.0E+01	n	6.0E+01(G)	1.4E-02	n	1.2E-02
						3.0E-05	I			1	0.1		Chloroacetophenone, 2-	532-27-4	4.3E+04	n	1.8E+05	nm	3.1E-02	n	1.3E-01	n						
2.0E-01	P			5.0E-04	P					1	0.1		Chloroaniline, p-	106-47-8	2.7E+00	c*	1.1E+01	c*					3.7E-01	c*		1.6E-04	c*	
				2.0E-02	I	5.0E-02	P	V		1		7.6E+02	Chlorobenzene	108-90-7	2.8E+02	n	1.3E+03	ns	5.2E+01	n	2.2E+02	n	7.8E+01	n	1.0E+02	5.3E-02	n	6.8E-02
				1.0E-01	X					1	0.1		Chlorobenzene sulfonic acid, p-	98-66-8	6.3E+03	n	8.2E+04	n					2.0E+03	n		4.7E-01	n	
1.1E-01	C	3.1E-05	C	2.0E-02	I					1	0.1		Chlorobenzilate	510-15-6	4.9E+00	c	2.1E+01	c	9.1E-02	c	4.0E-01	c	3.1E-01	c		1.0E-03	c	
				3.0E-02	X					1	0.1		Chlorobenzoic Acid, p-	74-11-3	1.9E+03	n	2.5E+04	n					5.1E+02	n		1.3E-01	n	
		8.6E-06	C	3.0E-03	P	3.0E-01	P	V		1		2.9E+02	Chlorobenzotrifluoride, 4-	98-56-6	2.2E+00	c*	9.6E+00	c	3.3E-01	c	1.4E+00	c	6.5E-01	c*		2.3E-03	c*	
				4.0E-02	P			V		1		7.3E+02	Chlorobutane, 1-	109-69-3	3.1E+03	ns	4.7E+04	ns					6.4E+02	n		2.6E-01	n	
						5.0E+01	I	V		1		1.7E+03	Chlorodifluoromethane	75-45-6	4.9E+04	ns	2.1E+05	nms	5.2E+04	n	2.2E+05	n	1.0E+05	n		4.3E+01	n	
				2.0E-02	P			V		1		1.1E+05	Chloroethanol, 2-	107-07-3	1.6E+03	n	2.3E+04	n					4.0E+02	n		8.1E-02	n	
3.1E-02	C	2.3E-05	I	1.0E-02	I	9.8E-02	A	V		1		2.5E+03	Chloroform	67-66-3	3.2E-01	c	1.4E+00	c	1.2E-01	c	5.3E-01	c	2.2E-01	c	8.0E+01(G)	6.1E-05	c	2.2E-02
						9.0E-02	I	V		1		1.3E+03	Chloromethane	74-87-3	1.1E+02	n	4.6E+02	n	9.4E+01	n	3.9E+02	n	1.9E+02	n		4.9E-02	n	
2.4E+00	C	6.9E-04	C					V		1		9.3E+03	Chloromethyl Methyl Ether	107-30-2	2.0E-02	c	8.9E-02	c	4.1E-03	c	1.8E-02	c	6.5E-03	c		1.4E-06	c	
3.0E-01	P			3.0E-03	P	1.0E-05	X			1	0.1		Chloronitrobenzene, o-	88-73-3	1.8E+00	c	7.7E+00	c	1.0E-02	n	4.4E-02	n	2.4E-01	c		2.2E-04	c	
6.0E-02	P			7.0E-04	P	2.0E-03	P			1	0.1		Chloronitrobenzene, p-	100-00-5	9.0E+00	c**	3.8E+01	c*	2.1E+00	n	8.8E+00	n	1.2E+00	c*		1.1E-03	c*	
				5.0E-03	I			V		1		2.7E+04	Chlorophenol, 2-	95-57-8	3.9E+02	n	5.8E+03	n					9.1E+01	n		8.9E-02	n	
						4.0E-04	C	V		1		6.2E+02	Chloropicrin	76-06-2	2.0E+00	n	8.2E+00	n	4.2E-01	n	1.8E+00	n	8.3E-01	n		2.5E-04	n	
1.7E-02	C			1.5E-02	I					1	0.1		Chlorothalonil	1897-45-6	3.2E+01	c*	1.4E+02	c*					4.0E+00	c*		9.0E-03	c*	
				2.0E-02	I			V		1		9.1E+02	Chlorotoluene, o-	95-49-8	1.6E+03	ns	2.3E+04	ns					2.4E+02	n		2.3E-01	n	
				2.0E-02	X			V		1		2.5E+02	Chlorotoluene, p-	106-43-4	1.6E+03	ns	2.3E+04	ns					2.5E+02	n		2.4E-01	n	
2.4E+02	C	6.9E-02	C							1	0.1		Chlorozotocin	54749-90-5	2.3E-03	c	9.6E-03	c	4.1E-05	c	1.8E-04	c	3.2E-04	c		7.1E-08	c	
				5.0E-03	O					1	0.1		Chlorpropham	101-21-3	3.2E+02	n	4.1E+03	n					7.1E+01	n		6.4E-02	n	
				1.0E-03	A					1	0.1		Chlorpyrifos	2921-88-2	6.3E+01	n	8.2E+02	n					8.4E+00	n		1.2E-01	n	
				1.0E-02	H					1	0.1		Chlorpyrifos Methyl	5598-13-0	6.3E+02	n	8.2E+03	n					1.2E+02	n		5.4E-01	n	
				5.0E-02	O					1	0.1		Chlorsulfuron	64902-72-3	3.2E+03	n	4.1E+04	n					9.9E+02	n		8.3E-01	n	

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = OW; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; c = cancer; n = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded; V = volatile; M = mutagen.

Toxicity and Chemical-specific Information													Contaminant		Screening Levels											Protection of Groundwater SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tap Water (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
				1.0E-02	I					1	0.1		Chlorthal-dimethyl	1861-32-1	6.3E+02	n	8.2E+03	n					1.2E+02	n		1.5E-01	n	
				8.0E-04	H					1	0.1		Chlorthiophos	60238-56-4	5.1E+01	n	6.6E+02	n					2.8E+00	n		7.3E-02	n	
				1.5E+00	I					0.013			Chromium(III), Insoluble Salts	16065-83-1	1.2E+05	nm	1.8E+06	nm					2.2E+04	n		4.0E+07	n	
5.0E-01	C	8.4E-02	G	3.0E-03	I	1.0E-04	I		M	0.025			Chromium(VI)	18540-29-9	3.0E-01	c	6.3E+00	c	1.2E-05	c	1.5E-04	c	3.5E-02	c		6.7E-04	c	
										0.013			Chromium, Total	7440-47-3											1.0E+02			1.8E+05
				1.3E-02	I					1	0.1		Clofentezine	74115-24-5	8.2E+02	n	1.1E+04	n					2.3E+02	n		1.4E+01	n	
		9.0E-03	P	3.0E-04	P	6.0E-06	P			1			Cobalt	7440-48-4	2.3E+01	n	3.5E+02	n	3.1E-04	c*	1.4E-03	c*	6.0E+00	n		2.7E-01	n	
		6.2E-04	I					V	M	1			Coke Oven Emissions	E649830					1.6E-03	c	2.0E-02	c						
				4.0E-02	H					1			Copper	7440-50-8	3.1E+03	n	4.7E+04	n					8.0E+02	n	1.3E+03	2.8E+01	n	4.6E+01
				5.0E-02	I	6.0E-01	C			1	0.1		Cresol, m-	108-39-4	3.2E+03	n	4.1E+04	n	6.3E+02	n	2.6E+03	n	9.3E+02	n		7.4E-01	n	
				5.0E-02	I	6.0E-01	C			1	0.1		Cresol, o-	95-48-7	3.2E+03	n	4.1E+04	n	6.3E+02	n	2.6E+03	n	9.3E+02	n		7.5E-01	n	
				2.0E-02	P	6.0E-01	C			1	0.1		Cresol, p-	106-44-5	1.3E+03	n	1.6E+04	n	6.3E+02	n	2.6E+03	n	3.7E+02	n		3.0E-01	n	
				1.0E-01	A					1	0.1		Cresol, p-chloro-m-	59-50-7	6.3E+03	n	8.2E+04	n					1.4E+03	n		1.7E+00	n	
				1.0E-01	A	6.0E-01	C			1	0.1		Cresols	1319-77-3	6.3E+03	n	8.2E+04	n	6.3E+02	n	2.6E+03	n	1.5E+03	n		1.3E+00	n	
1.9E+00	H			1.0E-03	P			V		1		1.7E+04	Crotonaldehyde, trans-	123-73-9	3.7E-01	c	1.7E+00	c					4.0E-02	c		8.2E-06	c	
				1.0E-01	I	4.0E-01	I	V		1		2.7E+02	Cumene	98-82-8	1.9E+03	ns	9.9E+03	ns	4.2E+02	n	1.8E+03	n	4.5E+02	n		7.4E-01	n	
2.2E-01	C	6.3E-05	C							1	0.1		Cupferron	135-20-6	2.5E+00	c	1.0E+01	c	4.5E-02	c	1.9E-01	c	3.5E-01	c		6.1E-04	c	
8.4E-01	H			2.0E-03	H					1	0.1		Cyanazine	21725-46-2	6.5E-01	c	2.7E+00	c					8.8E-02	c		4.1E-05	c	
													Cyanides															
				1.0E-03	I	9.0E-03	C			1			~Calcium Cyanide	592-01-8	7.8E+01	n	1.2E+03	n	9.4E+00	n	3.9E+01	n	2.0E+01	n				
				5.0E-03	I					1			~Copper Cyanide	544-92-3	3.9E+02	n	5.8E+03	n					1.0E+02	n				
				6.0E-04	I	8.0E-04	G	V		1		9.5E+05	~Cyanide (CN-)	57-12-5	2.3E+01	n	1.5E+02	n	8.3E-01	n	3.5E+00	n	1.5E+00	n	2.0E+02	1.5E-02	n	2.0E+00
				1.0E-03	I			V		1			~Cyanogen	460-19-5	7.8E+01	n	1.2E+03	n					2.0E+01	n				
				9.0E-02	I			V		1			~Cyanogen Bromide	506-68-3	7.0E+03	n	1.1E+05	nm					1.8E+03	n				
				5.0E-02	I			V		1			~Cyanogen Chloride	506-77-4	3.9E+03	n	5.8E+04	n					1.0E+03	n				
				6.0E-04	I	8.0E-04	I	V		1		1.0E+07	~Hydrogen Cyanide	74-90-8	2.3E+01	n	1.5E+02	n	8.3E-01	n	3.5E+00	n	1.5E+00	n		1.5E-02	n	
				2.0E-03	I	9.0E-03	C			1			~Potassium Cyanide	151-50-8	1.6E+02	n	2.3E+03	n	9.4E+00	n	3.9E+01	n	4.0E+01	n				
				5.0E-03	I					0.04			~Potassium Silver Cyanide	506-61-6	3.9E+02	n	5.8E+03	n					8.2E+01	n				
				1.0E-01	I					0.04			~Silver Cyanide	506-64-9	7.8E+03	n	1.2E+05	nm					1.8E+03	n				
				1.0E-03	I	9.0E-03	C			1			~Sodium Cyanide	143-33-9	7.8E+01	n	1.2E+03	n	9.4E+00	n	3.9E+01	n	2.0E+01	n	2.0E+02			
				2.0E-04	P					1			~Thiocyanates	E1790665	1.6E+01	n	2.3E+02	n					4.0E+00	n				
				2.0E-04	X			V		1			~Thiocyanic Acid	463-56-9	1.6E+01	n	2.3E+02	n					4.0E+00	n				
				5.0E-02	I					1			~Zinc Cyanide	557-21-1	3.9E+03	n	5.8E+04	n					1.0E+03	n				
						6.0E+00	I	V		1		1.2E+02	Cyclohexane	110-82-7	6.5E+03	ns	2.7E+04	ns	6.3E+03	n	2.6E+04	n	1.3E+04	n		1.3E+01	n	
2.0E-02	X			2.0E-02	X					1	0.1		Cyclohexane, 1,2,3,4,5-pentabromo-6-chloro-	87-84-3	2.7E+01	c*	1.1E+02	c					2.8E+00	c		1.6E-02	c	
				5.0E+00	I	7.0E-01	P	V		1		5.1E+03	Cyclohexanone	108-94-1	2.8E+04	ns	1.3E+05	nms	7.3E+02	n	3.1E+03	n	1.4E+03	n		3.4E-01	n	
				5.0E-03	P	1.0E+00	X	V		1		2.8E+02	Cyclohexene	110-83-8	3.1E+02	ns	3.1E+03	ns	1.0E+03	n	4.4E+03	n	7.0E+01	n		4.6E-02	n	
				2.0E-01	I			V		1		2.9E+05	Cyclohexylamine	108-91-8	1.6E+04	n	2.3E+05	nm					3.8E+03	n		1.0E+00	n	
				2.5E-02	I					1	0.1		Cyfluthrin	68359-37-5	1.6E+03	n	2.1E+04	n					1.2E+02	n		3.1E+01	n	
				5.0E-01	O					1	0.1		Cyromazine	66215-27-8	3.2E+04	n	4.1E+05	nm					9.9E+03	n		2.5E+00	n	
2.4E-01	I	6.9E-05	C	5.0E-04	A					1	0.1		DDD, p,p`- (DDD)	72-54-8	2.3E+00	c*	9.6E+00	c*	4.1E-02	c	1.8E-01	c	3.2E-02	c*		7.5E-03	c*	
3.4E-01	I	9.7E-05	C	5.0E-04	A			V		1			DDE, p,p'-	72-55-9	2.0E+00	c*	9.3E+00	c*	2.9E-02	c	1.3E-01	c	4.6E-02	c		1.1E-02	c	
3.4E-01	I	9.7E-05	I	5.0E-04	I					1	0.03		DDT	50-29-3	1.9E+00	c*	8.5E+00	c*	2.9E-02	c	1.3E-01	c	2.3E-01	c*		7.7E-02	c*	
				3.0E-02	I					1	0.1		Dalapon	75-99-0	1.9E+03	n	2.5E+04	n					6.0E+02	n	2.0E+02	1.2E-01	n	4.1E-02
1.8E-02	C	5.1E-06	C	1.5E-01	I					1	0.1		Daminozide	1596-84-5	3.0E+01	c	1.3E+02	c	5.5E-01	c	2.4E+00	c	4.3E+00	c		9.5E-04	c	
7.0E-04	I			7.0E-03	I					1	0.1		Decabromodiphenyl ether, 2,2',3,3',4,4',5,5',6,6'- (BDE-209)	1163-19-5	4.4E+02	n	3.3E+03	c**					1.1E+02	c**		6.2E+01	c**	
				4.0E-05	I					1	0.1		Demeton	8065-48-3	2.5E+00	n	3.3E+01	n					4.2E-01	n				
1.2E-03	I			6.0E-01	I					1	0.1		Di(2-ethylhexyl)adipate	103-23-1	4.5E+02	c*	1.9E+03	c					6.5E+01	c	4.0E+02	4.7E+00	c	2.9E+01
6.1E-02	H									1	0.1		Diallate	2303-16-4	8.9E+00	c	3.8E+01	c					5.4E-01	c		8.0E-04	c	
				7.0E-04	A					1	0.1		Diazinon	333-41-5	4.4E+01	n	5.7E+02	n					1.0E+01	n		6.5E-02	n	
8.0E-01	P	6.0E-03	P	2.0E-04	P	2.0E-04	I	V	M	1		9.8E+02	Dibromo-3-chloropropane, 1,2-	96-12-8	5.3E-03	c	6.4E-02	c	1.7E-04	c	2.0E-03	c	3.3E-04	c	2.0E-01	1.4E-07	c	8.6E-05
2.5E-01	C			3.0E-04	C					1	0.1		Dibromoacetic acid	631-64-1	2.2E+00	c**	9.2E+00	c*					3.1E-01	c*	6.0E+01(G)	6.3E-05	c*	1.2E-02
				4.0E-04	X			V		1		1.6E+02	Dibromobenzene, 1,3-	108-36-1	3.1E+01	n	4.7E+02	ns					5.3E+00	n		5.1E-03	n	
				1.0E-02	I			V		1			Dibromobenzene, 1,4-	106-37-6	7.8E+02	n	1.2E+04	n					1.3E+02	n		1.2E-01	n	
8.4E-02	I			2.0E-02	I			V		1		8.0E+02	Dibromochloromethane	124-48-1	8.3E+00	c	3.9E+01	c					8.7E-01	c	8.0E+01(G)	2.3E-04	c	2.1E-02
2.0E+00	I	6.0E-04	I	9.0E-03	I	9.0E-03	I	V		1		1.3E+03	Dibromoethane, 1,2-	106-93-4	3.6E-02	c	1.6E-01	c	4.7E-03	c	2.0E-02	c	7.5E-03	c	5.0E-02	2.1E-06	c	1.4E-05
						4.0E-03	X	V		1		2.8E+03	Dibromomethane (Methylene Bromide)	74-95-3	2.4E+01	n	9.9E+01	n	4.2E+00	n	1.8E+01	n	8.3E+00	n		2.1E-03	n	
				3.0E-04	P					1	0.1		Dibutyltin Compounds	E1790661	1.9E+01	n	2.5E+02	n					6.0E+00	n				
				3.0E-02	I					1	0.1		Dicamba	1918-00-9	1.9E+03	n	2.5E+04	n					5.7E+02	n		1.5E-01	n	
										1	0.1		Dichloramine	3400-09-7											4.0E+03(G)			
		4.2E-03	P					V		1		5.5E+02	Dichloro-2-butene, 1,4-	764-41-0	2.1E-03	c	9.4E-03	c	6.7E-04	c	2.9E-03	c	1.3E-03	c		6.6E-07	c	
		4.2E-03	P					V		1		5.2E+02	Dichloro-2-butene, cis-1,4-	1476-11-5	7.4E-03	c	3.2E-02	c	6.7E-04	c	2.9E-03	c	1.3E-03	c		6.2E-07	c	
		4.2E-03	P					V		1		7.6E+02	Dichloro-2-butene, trans-1,4-	110-57-6	7.4E-03	c	3.2E-02	c	6.7E-04	c	2.9E-03	c	1.3E-03	c		6.2E-07	c	
5.0E-02	I			4.0E-03	I					1	0.1		Dichloroacetic Acid	79-43-6	1.1E+01	c*	4.6E+01	c*					1.5E+00	c*	6.0E+01(G)	3.1E-04	c*	1.2E-02
				9.0E-02	I	2.0E-01	H	V		1		3.8E+02	Dichlorobenzene, 1,2-	95-50-1	1.8E+03	ns	9.3E+03	ns	2.1E+02	n	8.8E+02	n	3.0E+02	n	6.0E+02	3.0E-01	n	5.8E-01
5.4E-03	C	1.1E-05	C	7.0E-02	A	8.0E-01	I	V		1			Dichlorobenzene, 1,4-	106-46-7	2.6E+00	c	1.1E+01	c	2.6E-01	c	1.1E+00	c	4.8E-01	c	7.5E+01	4.6E-04	c	7.2E-02
4.5E-01	I	3.4E-04	C							1	0.1		Dichlorobenzidine, 3,3'-	91-94-1	1.2E+00	c	5.1E+00	c	8.3E-03	c	3.6E-02	c	1.3E-01	c		8.2E-04	c	
				9.0E-03	X					1	0.1		Dichlorobenzophenone, 4,4'-	90-98-2	5.7E+02	n	7.4E+03	n					7.8E+01	n		4.7E-01	n	
				2.0E-01	I	1.0E-01	X	V		1		8.5E+02	Dichlorodifluoromethane	75-71-8	8.7E+01	n	3.7E+02	n	1.0E+02	n	4.4E+02	n	2.0E+02	n		3.0E-01	n	
5.7E-03	C	1.6E-06	C	2.0E-01	P			V		1		1.7E+03	Dichloroethane, 1,1-	75-34-3	3.6E+00	c	1.6E+01	c	1.8E+00	c	7.7E+00	c	2.8E+00	c		7.8E-04	c	
9.1E-02	I	2.6E-05	I	6.0E-03	X	7.0E-03	P	V		1		3.0E+03	Dichloroethane, 1,2-	107-06-2	4.6E-01	c*	2.0E+00	c*	1.1E-01	c*	4.7E-01	c*	1.7E-01	c*	5.0E+00	4.8E-05	c*	1.4E-03
				5.0E-02	I	2.0E-01	I	V		1		1.2E+03	Dichloroethylene, 1,1-	75-35-4	2.3E+02	n	1.0E+03	n	2.1E+02	n	8.8E+02	n	2.8E+02	n	7.0E+00	1.0E-01	n	2.5E-03
				2.0E-03	I	4.0E-02	X	V		1		2.4E+03	Dichloroethylene, cis-1,2-	156-59-2	6.3E+01	n	3.7E+02	n	4.2E+01	n	1.8E+02	n	2.5E+01	n	7.0E+01	7.4E-03	n	2.1E-02
				2.0E-02	I	4.0E-02	X	V		1		1.9E+03	Dichloroethylene, trans-1,2-	156-60-5	7.0E+01	n	3.0E+02	n	4.2E+01	n	1.8E+02	n	6.8E+01	n	1.0E+02	2.1E-02	n	3.1E-02
				3.0E-03	I					1	0.1		Dichlorophenol, 2,4-	120-83-2	1.9E+02	n	2.5E+03	n					4.6E+01	n		2.3E-02	n	
				1.0E-02	I					1	0.05		Dichlorophenoxy Acetic Acid, 2,4-	94-75-7	7.0E+02	n	9.6E+03	n					1.7E+02	n	7.0E+01	4.5E-02	n	1.8E-02
3.7E-02	P	3.7E-06	P	4.0E-02	P	4.0E-03	I	V		1		1.4E+03	Dichloropropane, 1,2-	78-87-5	2.5E+00	c**	1.1E+01	c**	7.6E-01	c**	3.3E+00	c**	8.5E-01	c**	5.0E+00	2.8E-04	c**	1.7E-03
				2.0E-02	P			V		1		1.5E+03	Dichloropropane, 1,3-	142-28-9	1.6E+03	ns	2.3E+04	ns					3.7E+02	n		1.3E-01	n	

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = OW; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; c = cancer; n = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded; V = volatile; M = mutagen.

Toxicity and Chemical-specific Information														Contaminant		Screening Levels											Protection of Groundwater SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tap Water (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
				3.0E-03	I					1	0.1		Dichloropropanol, 2,3-	616-23-9	1.9E+02	n	2.5E+03	n					5.9E+01	n		1.3E-02	n	
1.0E-01	I	4.0E-06	I	3.0E-02	I	2.0E-02	I	V		1		1.6E+03	Dichloropropene, 1,3-	542-75-6	1.8E+00	c*	8.2E+00	c*	7.0E-01	c*	3.1E+00	c*	4.7E-01	c*		1.7E-04	c*	
2.9E-01	I	8.3E-05	C	5.0E-04	I	5.0E-04	I			1	0.1		Dichlorvos	62-73-7	1.9E+00	c*	7.9E+00	c*	3.4E-02	c*	1.5E-01	c*	2.6E-01	c*		8.1E-05	c*	
				3.0E-05	O					1	0.1		Dicrotophos	141-66-2	1.9E+00	n	2.5E+01	n					6.0E-01	n		1.4E-04	n	
				8.0E-02	P	3.0E-04	X	V		1		2.6E+02	Dicyclopentadiene	77-73-6	1.3E+00	n	5.4E+00	n	3.1E-01	n	1.3E+00	n	6.3E-01	n		2.2E-03	n	
1.6E+01	I	4.6E-03	I	5.0E-05	I					1	0.1		Dieldrin	60-57-1	3.4E-02	c*	1.4E-01	c	6.1E-04	c	2.7E-03	c	1.8E-03	c		7.1E-05	c	
		3.0E-04	C			5.0E-03	I			1	0.1		Diesel Engine Exhaust	E17136615					9.4E-03	c	4.1E-02	c						
				2.0E-03	P	2.0E-04	P			1	0.1		Diethanolamine	111-42-2	1.3E+02	n	1.6E+03	n	2.1E-01	n	8.8E-01	n	4.0E+01	n		8.1E-03	n	
				3.0E-02	P	1.0E-04	P			1	0.1		Diethylene Glycol Monobutyl Ether	112-34-5	1.9E+03	n	2.4E+04	n	1.0E-01	n	4.4E-01	n	6.0E+02	n		1.3E-01	n	
				6.0E-02	P	3.0E-04	P			1	0.1		Diethylene Glycol Monoethyl Ether	111-90-0	3.8E+03	n	4.8E+04	n	3.1E-01	n	1.3E+00	n	1.2E+03	n		2.4E-01	n	
				1.0E-03	P			V		1		1.1E+05	Diethylformamide	617-84-5	7.8E+01	n	1.2E+03	n					2.0E+01	n		4.1E-03	n	
3.5E+02	C	1.0E-01	C							1	0.1		Diethylstilbestrol	56-53-1	1.6E-03	c	6.6E-03	c	2.8E-05	c	1.2E-04	c	5.1E-05	c		2.8E-05	c	
				8.3E-02	O					1	0.1		Difenzoquat	43222-48-6	5.2E+03	n	6.8E+04	n					1.7E+03	n		2.6E+02	n	
				2.0E-02	I					1	0.1		Diflubenzuron	35367-38-5	1.3E+03	n	1.6E+04	n					2.9E+02	n		3.3E-01	n	
						4.0E+01	I	V		1		1.4E+03	Difluoroethane, 1,1-	75-37-6	4.8E+04	ns	2.0E+05	nms	4.2E+04	n	1.8E+05	n	8.3E+04	n		2.8E+01	n	
						3.0E+01	X	V		1		6.9E+02	Difluoropropane, 2,2-	420-45-1	2.4E+04	ns	1.0E+05	ns	3.1E+04	n	1.3E+05	n	6.3E+04	n		1.4E+02	n	
4.4E-02	C	1.3E-05	C					V		1			Dihydrosafrole	94-58-6	9.9E+00	c	4.5E+01	c	2.2E-01	c	9.4E-01	c	3.0E-01	c		1.9E-04	c	
						7.0E-01	P	V		1		2.3E+03	Diisopropyl Ether	108-20-3	2.2E+03	n	9.4E+03	ns	7.3E+02	n	3.1E+03	n	1.5E+03	n		3.7E-01	n	
				8.0E-02	I			V		1		5.3E+02	Diisopropyl Methylphosphonate	1445-75-6	6.3E+03	ns	9.3E+04	ns					1.6E+03	n		4.5E-01	n	
				2.2E-02	O					1	0.1		Dimethipin	55290-64-7	1.4E+03	n	1.8E+04	n					4.4E+02	n		9.6E-02	n	
				2.2E-03	O					1	0.1		Dimethoate	60-51-5	1.4E+02	n	1.8E+03	n					4.4E+01	n		9.9E-03	n	
1.6E+00	P	1.4E-01	C							1	0.1		Dimethoxybenzidine, 3,3'-	119-90-4	3.3E-01	c	1.4E+00	c	2.0E-05	c	8.8E-05	c	4.7E-02	c		5.8E-05	c	
1.7E-03	P			6.0E-02	P					1	0.1		Dimethyl methylphosphonate	756-79-6	3.2E+02	c*	1.4E+03	c*					4.6E+01	c*		9.6E-03	c*	
4.6E+00	C	1.3E-03	C							1	0.1		Dimethylamino azobenzene [p-]	60-11-7	1.2E-01	c	5.0E-01	c	2.2E-03	c	9.4E-03	c	5.0E-03	c		2.1E-05	c	
5.8E-01	H									1	0.1		Dimethylaniline HCl, 2,4-	21436-96-4	9.4E-01	c	4.0E+00	c					1.3E-01	c		1.2E-04	c	
2.0E-01	P			2.0E-03	X					1	0.1		Dimethylaniline, 2,4-	95-68-1	2.7E+00	c*	1.1E+01	c					3.7E-01	c		2.1E-04	c	
2.7E-02	P			2.0E-03	I			V		1		8.3E+02	Dimethylaniline, N,N-	121-69-7	2.6E+01	c**	1.2E+02	c*					2.5E+00	c*		9.0E-04	c*	
1.1E+01	P									1	0.1		Dimethylbenzidine, 3,3'-	119-93-7	4.9E-02	c	2.1E-01	c					6.5E-03	c		4.3E-05	c	
				1.0E-01	P	3.0E-02	I	V		1		1.1E+05	Dimethylformamide	68-12-2	2.6E+03	n	1.5E+04	n	3.1E+01	n	1.3E+02	n	6.1E+01	n		1.2E-02	n	
				1.0E-04	X	2.0E-06	X	V		1		1.7E+05	Dimethylhydrazine, 1,1-	57-14-7	5.7E-02	n	2.4E-01	n	2.1E-03	n	8.8E-03	n	4.2E-03	n		9.3E-07	n	
5.5E+02	C	1.6E-01	C							1		1.9E+05	Dimethylhydrazine, 1,2-	540-73-8	8.8E-04	c	4.1E-03	c	1.8E-05	c	7.7E-05	c	2.8E-05	c		6.5E-09	c	
				2.0E-02	I					1	0.1		Dimethylphenol, 2,4-	105-67-9	1.3E+03	n	1.6E+04	n					3.6E+02	n		4.2E-01	n	
				6.0E-04	I					1	0.1		Dimethylphenol, 2,6-	576-26-1	3.8E+01	n	4.9E+02	n					1.1E+01	n		1.3E-02	n	
				1.0E-03	I					1	0.1		Dimethylphenol, 3,4-	95-65-8	6.3E+01	n	8.2E+02	n					1.8E+01	n		2.1E-02	n	
4.5E-02	C	1.3E-05	C					V		1		4.7E+02	Dimethylvinylchloride	513-37-1	1.1E+00	c	4.8E+00	c	2.2E-01	c	9.4E-01	c	3.3E-01	c		1.1E-04	c	
				8.0E-05	X					1	0.1		Dinitro-o-cresol, 4,6-	534-52-1	5.1E+00	n	6.6E+01	n					1.5E+00	n		2.6E-03	n	
				2.0E-03	I					1	0.1		Dinitro-o-cyclohexyl Phenol, 4,6-	131-89-5	1.3E+02	n	1.6E+03	n					2.3E+01	n		7.7E-01	n	
				4.0E-04	X	2.0E-03	X			1	0.1		Dinitroaniline, 3,5-	618-87-1	2.5E+01	n	3.3E+02	n	2.1E+00	n	8.8E+00	n	7.7E+00	n		4.1E-03	n	
				1.0E-04	P					1	0.1		Dinitrobenzene, 1,2-	528-29-0	6.3E+00	n	8.2E+01	n					1.9E+00	n		1.8E-03	n	
				1.0E-04	I					1	0.1		Dinitrobenzene, 1,3-	99-65-0	6.3E+00	n	8.2E+01	n					2.0E+00	n		1.8E-03	n	
				1.0E-04	P					1	0.1		Dinitrobenzene, 1,4-	100-25-4	6.3E+00	n	8.2E+01	n					2.0E+00	n		1.8E-03	n	
				2.0E-03	I					1	0.1		Dinitrophenol, 2,4-	51-28-5	1.3E+02	n	1.6E+03	n					3.9E+01	n		4.4E-02	n	
6.8E-01	I									1	0.1		Dinitrotoluene Mixture, 2,4/2,6-	E1615210	8.0E-01	c	3.4E+00	c					1.1E-01	c		1.5E-04	c	
3.1E-01	C	8.9E-05	C	2.0E-03	I					1	0.102		Dinitrotoluene, 2,4-	121-14-2	1.7E+00	c*	7.4E+00	c	3.2E-02	c	1.4E-01	c	2.4E-01	c		3.2E-04	c	
1.5E+00	P			3.0E-04	X					1	0.099		Dinitrotoluene, 2,6-	606-20-2	3.6E-01	c*	1.5E+00	c					4.9E-02	c		6.7E-05	c	
				1.0E-04	X					1	0.006		Dinitrotoluene, 2-Amino-4,6-	35572-78-2	7.7E+00	n	1.1E+02	n					1.9E+00	n		1.5E-03	n	
				1.0E-04	X					1	0.009		Dinitrotoluene, 4-Amino-2,6-	19406-51-0	7.7E+00	n	1.1E+02	n					1.9E+00	n		1.5E-03	n	
4.5E-01	X			9.0E-04	X					1	0.1		Dinitrotoluene, Technical grade	25321-14-6	1.2E+00	c*	5.1E+00	c					1.0E-01	c		1.4E-04	c	
				1.0E-03	I					1	0.1		Dinoseb	88-85-7	6.3E+01	n	8.2E+02	n					1.5E+01	n	7.0E+00	1.3E-01	n	6.2E-02
1.0E-01	I	5.0E-06	I	3.0E-02	I	3.0E-02	I	V		1		1.2E+05	Dioxane, 1,4-	123-91-1	5.3E+00	c	2.4E+01	c	5.6E-01	c*	2.5E+00	c*	4.6E-01	c		9.4E-05	c	
													Dioxins															
6.2E+03	I	1.3E+00	I							1	0.03		~Hexachlorodibenzo-p-dioxin, Mixture	34465-46-8	1.0E-04	c	4.7E-04	c	2.2E-06	c	9.4E-06	c	1.3E-05	c		1.7E-05	c	
1.3E+05	C	3.8E+01	C	7.0E-10	I	4.0E-08	C	V		1	0.03		~TCDD, 2,3,7,8-	1746-01-6	4.8E-06	c*	2.2E-05	c*	7.4E-08	c	3.2E-07	c	1.2E-07	c	3.0E-05	5.9E-08	c	1.5E-05
				3.0E-02	I					1	0.1		Diphenamid	957-51-7	1.9E+03	n	2.5E+04	n					5.3E+02	n		5.2E+00	n	
						4.0E-04	X	V		1			Diphenyl Ether	101-84-8	3.4E+01	n	1.4E+02	n	4.2E-01	n	1.8E+00	n	8.3E-01	n		3.4E-03	n	
				8.0E-04	X					1	0.1		Diphenyl Sulfone	127-63-9	5.1E+01	n	6.6E+02	n					1.5E+01	n		3.6E-02	n	
				1.0E-01	O					1	0.1		Diphenylamine	122-39-4	6.3E+03	n	8.2E+04	n					1.3E+03	n		2.3E+00	n	
8.0E-01	I	2.2E-04	I							1	0.1		Diphenylhydrazine, 1,2-	122-66-7	6.8E-01	c	2.9E+00	c	1.3E-02	c	5.6E-02	c	7.8E-02	c		2.5E-04	c	
				2.2E-03	I					1	0.1		Diquat	2764-72-9	1.4E+02	n	1.8E+03	n					4.0E+01	n	2.0E+01	3.3E-01	n	1.7E-01
7.4E+00	C	2.1E-03	C							1	0.1		Direct Black 38	1937-37-7	7.3E-02	c	3.1E-01	c	1.3E-03	c	5.8E-03	c	1.1E-02	c		5.1E+00	c	
7.4E+00	C	2.1E-03	C							1	0.1		Direct Blue 6	2602-46-2	7.3E-02	c	3.1E-01	c	1.3E-03	c	5.8E-03	c	1.1E-02	c		1.7E+01	c	
6.7E+00	C	1.9E-03	C							1	0.1		Direct Brown 95	16071-86-6	8.1E-02	c	3.4E-01	c	1.5E-03	c	6.5E-03	c	1.2E-02	c		1.6E-01	c	
				4.0E-05	I					1	0.1		Disulfoton	298-04-4	2.5E+00	n	3.3E+01	n					5.0E-01	n		9.4E-04	n	
				1.0E-02	I			V		1			Dithiane, 1,4-	505-29-3	7.8E+02	n	1.2E+04	n					2.0E+02	n		9.7E-02	n	
				2.0E-03	I					1	0.1		Diuron	330-54-1	1.3E+02	n	1.6E+03	n					3.6E+01	n		1.5E-02	n	
				2.0E-02	O					1	0.1		Dodine	2439-10-3	1.3E+03	n	1.6E+04	n					4.0E+02	n		2.1E+00	n	
				5.0E-02	O			V		1			EPTC	759-94-4	3.9E+03	n	5.8E+04	n					7.5E+02	n		4.0E-01	n	
				6.0E-03	I			V		1			Endosulfan	115-29-7	4.7E+02	n	7.0E+03	n					1.0E+02	n		1.4E+00	n	
				6.0E-03	P					1	0.1		Endosulfan Sulfate	1031-07-8	3.8E+02	n	4.9E+03	n					1.1E+02	n		2.1E+00	n	
				2.0E-02	I					1	0.1		Endothall	145-73-3	1.3E+03	n	1.6E+04	n					3.8E+02	n	1.0E+02	9.1E-02	n	2.4E-02
				3.0E-04	I					1	0.1		Endrin	72-20-8	1.9E+01	n	2.5E+02	n					2.3E+00	n	2.0E+00	9.2E-02	n	8.1E-02
9.9E-03	I	1.2E-06	I	6.0E-03	P	1.0E-03	I	V		1		1.1E+04	Epichlorohydrin	106-89-8	1.9E+01	n	8.2E+01	n	1.0E+00	n	4.4E+00	n	2.0E+00	n		4.5E-04	n	
						2.0E-02	I	V		1		1.5E+04	Epoxybutane, 1,2-	106-88-7	1.6E+02	n	6.7E+02	n	2.1E+01	n	8.8E+01	n	4.2E+01	n		9.2E-03	n	
				4.0E-02	P					1	0.1		Ethanol, 2-(2-methoxyethoxy)-	111-77-3	2.5E+03	n	3.3E+04	n					8.0E+02	n		1.6E-01	n	
				5.0E-03	I					1	0.1		Ethephon	16672-87-0	3.2E+02	n	4.1E+03	n					1.0E+02	n		2.1E-02	n	
				5.0E-04	I					1	0.1		Ethion	563-12-2	3.2E+01	n	4.1E+02	n					4.3E+00	n		8.5E-03	n	
				1.0E-01	P	6.0E-02	P	V		1		2.4E+04	Ethoxyethanol Acetate, 2-	111-15-9	2.6E+03	n	1.4E+04	n	6.3E+01	n	2.6E+02	n	1.2E+02	n		2.5E-02	n	
				9.0E-02	P	4.0E-02	P	V		1		1.1E+05	Ethoxyethanol, 2-	110-80-5	2.6E+03	n	1.5E+04	n	4.2E+01	n	1.8E+02	n	8.0E+01	n		1.6E-02	n	

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = OW; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; c = cancer; n = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded; V = volatile; M = mutagen.

Toxicity and Chemical-specific Information														Contaminant		Screening Levels												Protection of Groundwater SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tap Water (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
				7.0E-01	P	7.0E-02	P	V		1		1.1E+04	Ethyl Acetate	141-78-6	6.2E+02	n	2.6E+03	n	7.3E+01	n	3.1E+02	n	1.4E+02	n		3.1E-02	n	
				5.0E-03	P	8.0E-03	P	V		1		2.5E+03	Ethyl Acrylate	140-88-5	4.7E+01	n	2.1E+02	n	8.3E+00	n	3.5E+01	n	1.4E+01	n		3.2E-03	n	
						4.0E+00	P	V		1		2.1E+03	Ethyl Chloride (Chloroethane)	75-00-3	5.4E+03	ns	2.3E+04	ns	4.2E+03	n	1.8E+04	n	8.3E+03	n		2.4E+00	n	
				2.0E-01	I			V		1		1.0E+04	Ethyl Ether	60-29-7	1.6E+04	ns	2.3E+05	nms					3.9E+03	n		8.8E-01	n	
						3.0E-01	P	V		1		1.1E+03	Ethyl Methacrylate	97-63-2	1.8E+03	ns	7.6E+03	ns	3.1E+02	n	1.3E+03	n	6.3E+02	n		1.5E-01	n	
		8.0E-08	I	1.0E+00	I	4.0E+01	I	V		1		2.9E+03	Ethyl Tertiary Butyl Ether (ETBE)	637-92-3	1.3E+02	c	5.6E+02	c	3.5E+01	c	1.5E+02	c	7.0E+01	c		1.7E-02	c	
				1.0E-05	I					1	0.1		Ethyl-p-nitrophenyl Phosphonate	2104-64-5	6.3E-01	n	8.2E+00	n					8.9E-02	n		2.8E-03	n	
1.1E-02	C	2.5E-06	C	5.0E-02	P	1.0E+00	I	V		1		4.8E+02	Ethylbenzene	100-41-4	5.8E+00	c	2.5E+01	c	1.1E+00	c	4.9E+00	c	1.5E+00	c	7.0E+02	1.7E-03	c	7.8E-01
				7.0E-02	P					1	0.1		Ethylene Cyanohydrin	109-78-4	4.4E+03	n	5.7E+04	n					1.4E+03	n		2.8E-01	n	
				9.0E-02	P			V		1		1.9E+05	Ethylene Diamine	107-15-3	7.0E+03	n	1.1E+05	nm					1.8E+03	n		4.1E-01	n	
				8.0E-01	A	4.0E-01	C			1	0.1		Ethylene Glycol	107-21-1	5.1E+04	n	6.6E+05	nm	4.2E+02	n	1.8E+03	n	1.6E+04	n		3.2E+00	n	
				1.0E-01	I	1.6E+00	I			1	0.1		Ethylene Glycol Monobutyl Ether	111-76-2	6.3E+03	n	8.2E+04	n	1.7E+03	n	7.0E+03	n	2.0E+03	n		4.1E-01	n	
3.1E-01	C	3.0E-03	I			3.0E-02	C	V	M	1		1.2E+05	Ethylene Oxide	75-21-8	2.0E-03	c	2.5E-02	c	3.4E-04	c	4.1E-03	c	6.7E-04	c		1.4E-07	c	
4.5E-02	C	1.3E-05	C	8.0E-05	I					1	0.1		Ethylene Thiourea	96-45-7	5.1E+00	n	5.1E+01	c**	2.2E-01	c	9.4E-01	c	1.6E+00	n		3.6E-04	n	
6.5E+01	C	1.9E-02	C					V		1		1.5E+05	Ethyleneimine	151-56-4	2.7E-03	c	1.2E-02	c	1.5E-04	c	6.5E-04	c	2.4E-04	c		5.2E-08	c	
				3.0E+00	I					1	0.1		Ethylphthalyl Ethyl Glycolate	84-72-0	1.9E+05	nm	2.5E+06	nm					5.8E+04	n		1.3E+02	n	
				2.5E-04	I					1	0.1		Fenamiphos	22224-92-6	1.6E+01	n	2.1E+02	n					4.4E+00	n		4.3E-03	n	
				2.5E-02	I					1	0.1		Fenpropathrin	39515-41-8	1.6E+03	n	2.1E+04	n					6.4E+01	n		2.9E+00	n	
				2.5E-02	I					1	0.1		Fenvalerate	51630-58-1	1.6E+03	n	2.1E+04	n					5.0E+02	n		3.2E+02	n	
				1.3E-02	I					1	0.1		Fluometuron	2164-17-2	8.2E+02	n	1.1E+04	n					2.4E+02	n		1.9E-01	n	
				4.0E-02	C	1.3E-02	C			1			Fluoride	16984-48-8	3.1E+03	n	4.7E+04	n	1.4E+01	n	5.7E+01	n	8.0E+02	n	4.0E+03	1.2E+02	n	6.0E+02
				6.0E-02	I	1.3E-02	C			1			Fluorine (Soluble Fluoride)	7782-41-4	4.7E+03	n	7.0E+04	n	1.4E+01	n	5.7E+01	n	1.2E+03	n	4.0E+03	1.8E+02	n	6.0E+02
				8.0E-02	I					1	0.1		Fluridone	59756-60-4	5.1E+03	n	6.6E+04	n					1.4E+03	n		1.6E+02	n	
				4.0E-02	O					1	0.1		Flurprimidol	56425-91-3	2.5E+03	n	3.3E+04	n					6.9E+02	n		3.1E+00	n	
				2.0E-03	O					1	0.1		Flusilazole	85509-19-9	1.3E+02	n	1.6E+03	n					3.1E+01	n		5.1E+00	n	
				5.0E-01	O					1	0.1		Flutolanil	66332-96-5	3.2E+04	n	4.1E+05	nm					7.9E+03	n		4.2E+01	n	
				1.0E-02	I					1	0.1		Fluvalinate	69409-94-5	6.3E+02	n	8.2E+03	n					2.0E+02	n		2.9E+02	n	
				9.0E-02	O					1	0.1		Folpet	133-07-3	5.7E+03	n	7.4E+04	n					1.6E+03	n		3.9E-01	n	
				1.0E-02	O					1	0.1		Fomesafen	72178-02-0	6.3E+02	n	8.2E+03	n					1.9E+02	n		6.3E-01	n	
				2.0E-03	I					1	0.1		Fonofos	944-22-9	1.3E+02	n	1.6E+03	n					2.4E+01	n		4.7E-02	n	
2.1E-02	C	1.3E-05	I	2.0E-01	I	9.8E-03	A	V		1		4.2E+04	Formaldehyde	50-00-0	1.1E+01	c*	5.0E+01	c*	2.2E-01	c*	9.4E-01	c*	3.9E-01	c*		7.8E-05	c*	
				9.0E-01	P	3.0E-04	X	V		1		1.1E+05	Formic Acid	64-18-6	2.9E+01	n	1.2E+02	n	3.1E-01	n	1.3E+00	n	6.3E-01	n		1.3E-04	n	
				2.5E+00	O					1	0.1		Fosetyl-AL	39148-24-8	1.6E+05	nm	2.1E+06	nm					5.0E+04	n		6.6E+02	n	
													Furans																
				1.0E-03	X			V		1			~Dibenzofuran	132-64-9	7.8E+01	n	1.2E+03	n					7.9E+00	n		1.5E-01	n	
				1.0E-03	I			V		1		6.2E+03	~Furan	110-00-9	7.8E+01	n	1.2E+03	n					1.9E+01	n		7.3E-03	n	
				9.0E-01	I	2.0E+00	I	V		1		1.7E+05	~Tetrahydrofuran	109-99-9	1.8E+04	n	9.5E+04	n	2.1E+03	n	8.8E+03	n	3.4E+03	n		7.5E-01	n	
3.8E+00	H									1	0.1		Furazolidone	67-45-8	1.4E-01	c	6.0E-01	c					2.0E-02	c		3.9E-05	c	
				3.0E-03	I	5.0E-02	H	V		1		1.0E+04	Furfural	98-01-1	2.1E+02	n	2.6E+03	n	5.2E+01	n	2.2E+02	n	3.8E+01	n		8.1E-03	n	
1.5E+00	C	4.3E-04	C							1	0.1		Furium	531-82-8	3.6E-01	c	1.5E+00	c	6.5E-03	c	2.9E-02	c	5.1E-02	c		6.8E-05	c	
3.0E-02	I	8.6E-06	C							1	0.1		Furmecyclox	60568-05-0	1.8E+01	c	7.7E+01	c	3.3E-01	c	1.4E+00	c	1.1E+00	c		1.2E-03	c	
				6.0E-03	O					1	0.1		Glufosinate, Ammonium	77182-82-2	3.8E+02	n	4.9E+03	n					1.2E+02	n		2.6E-02	n	
				1.0E-01	A	8.0E-05	C			1	0.1		Glutaraldehyde	111-30-8	6.0E+03	n	7.0E+04	n	8.3E-02	n	3.5E-01	n	2.0E+03	n		4.0E-01	n	
				4.0E-04	I	1.0E-03	X	V		1		1.1E+05	Glycidaldehyde	765-34-4	2.3E+01	n	2.1E+02	n	1.0E+00	n	4.4E+00	n	1.7E+00	n		3.3E-04	n	
				1.0E-01	I					1	0.1		Glyphosate	1071-83-6	6.3E+03	n	8.2E+04	n					2.0E+03	n	7.0E+02	8.8E+00	n	3.1E+00
				1.0E-02	X			V		1			Guanidine	113-00-8	7.8E+02	n	1.2E+04	n					2.0E+02	n		4.5E-02	n	
				2.0E-02	P					1	0.1		Guanidine Chloride	50-01-1	1.3E+03	n	1.6E+04	n					4.0E+02	n				
				3.0E-02	X					1	0.1		Guanidine Nitrate	506-93-4	1.9E+03	n	2.5E+04	n					6.0E+02	n		1.5E-01	n	
				5.0E-05	I					1	0.1		Haloxyfop, Methyl	69806-40-2	3.2E+00	n	4.1E+01	n					7.6E-01	n		8.4E-03	n	
4.5E+00	I	1.3E-03	I	1.0E-04	A			V		1			Heptachlor	76-44-8	1.3E-01	c*	6.3E-01	c	2.2E-03	c	9.4E-03	c	1.4E-03	c	4.0E-01	1.2E-04	c	3.3E-02
9.1E+00	I	2.6E-03	I	1.3E-05	I			V		1			Heptachlor Epoxide	1024-57-3	7.0E-02	c*	3.3E-01	c*	1.1E-03	c	4.7E-03	c	1.4E-03	c*	2.0E-01	2.8E-05	c*	4.1E-03
						3.0E-03	X	V		1		2.1E+02	Heptanal, n-	111-71-7	2.4E+01	n	1.0E+02	n	3.1E+00	n	1.3E+01	n	6.3E+00	n		1.4E-03	n	
				3.0E-04	X	4.0E-01	P	V		1		5.8E+01	Heptane, N-	142-82-5	2.2E+01	n	2.9E+02	ns	4.2E+02	n	1.8E+03	n	6.0E+00	n		4.8E-02	n	
				2.0E-03	I			V		1			Hexabromobenzene	87-82-1	1.6E+02	n	2.3E+03	n					4.0E+01	n		2.3E-01	n	
				2.0E-04	I					1	0.1		Hexabromodiphenyl ether, 2,2',4,4',5,5'- (BDE-153)	68631-49-2	1.3E+01	n	1.6E+02	n					4.0E+00	n				
1.6E+00	I	4.6E-04	I	1.0E-05	P			V		1			Hexachlorobenzene	118-74-1	2.1E-01	c**	9.6E-01	c*	6.1E-03	c	2.7E-02	c	9.8E-03	c*	1.0E+00	1.2E-04	c*	1.3E-02
7.8E-02	I	2.2E-05	I	1.0E-03	P			V		1		1.7E+01	Hexachlorobutadiene	87-68-3	1.2E+00	c*	5.3E+00	c	1.3E-01	c	5.6E-01	c	1.4E-01	c*		2.7E-04	c*	
6.3E+00	I	1.8E-03	I							1	0.1		Hexachlorocyclohexane, Alpha-	319-84-6	8.6E-02	c	3.6E-01	c	1.6E-03	c	6.8E-03	c	7.2E-03	c		4.2E-05	c	
1.8E+00	I	5.3E-04	I							1	0.1		Hexachlorocyclohexane, Beta-	319-85-7	3.0E-01	c	1.3E+00	c	5.3E-03	c	2.3E-02	c	2.5E-02	c		1.5E-04	c	
1.1E+00	C	3.1E-04	C	3.0E-04	I					1	0.04		Hexachlorocyclohexane, Gamma- (Lindane)	58-89-9	5.7E-01	c*	2.5E+00	c	9.1E-03	c	4.0E-02	c	4.2E-02	c*	2.0E-01	2.4E-04	c*	1.2E-03
1.8E+00	I	5.1E-04	I							1	0.1		Hexachlorocyclohexane, Technical	608-73-1	3.0E-01	c	1.3E+00	c	5.5E-03	c	2.4E-02	c	2.5E-02	c		1.5E-04	c	
				6.0E-03	I	2.0E-04	I	V		1		1.6E+01	Hexachlorocyclopentadiene	77-47-4	1.8E+00	n	7.5E+00	n	2.1E-01	n	8.8E-01	n	4.1E-01	n	5.0E+01	1.3E-03	n	1.6E-01
4.0E-02	I	1.1E-05	C	7.0E-04	I	3.0E-02	I	V		1			Hexachloroethane	67-72-1	1.8E+00	c*	8.0E+00	c*	2.6E-01	c	1.1E+00	c	3.3E-01	c*		2.0E-04	c*	
				3.0E-04	I					1	0.1		Hexachlorophene	70-30-4	1.9E+01	n	2.5E+02	n					6.0E+00	n		8.0E+00	n	
8.0E-02	I			4.0E-03	I					1	0.015		Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	121-82-4	8.3E+00	c*	3.8E+01	c					9.7E-01	c*		3.7E-04	c*	
						1.0E-05	I	V		1		3.4E+03	Hexamethylene Diisocyanate, 1,6-	822-06-0	3.1E+00	n	1.3E+01	n	1.0E-02	n	4.4E-02	n	2.1E-02	n		2.1E-04	n	
						4.0E-04	C			1	0.1		Hexamethylene diisocyanate biuret	4035-89-6	5.7E+05	nm	2.4E+06	nm	4.2E-01	n	1.8E+00	n						
						4.0E-04	C			1	0.1		Hexamethylene diisocyanate isocyanurate	3779-63-3	5.7E+05	nm	2.4E+06	nm	4.2E-01	n	1.8E+00	n						
				4.0E-04	P					1	0.1		Hexamethylphosphoramide	680-31-9	2.5E+01	n	3.3E+02	n					8.0E+00	n		1.8E-03	n	
		2.0E-07	X			6.0E-01	P	V		1		1.4E+02	Hexane, Commercial	E5241997	1.2E+01	c*	5.1E+01	c*	1.4E+01	c*	6.1E+01	c*	2.8E+01	c*		2.0E-01	c*	
						7.0E-01	I	V		1		1.4E+02	Hexane, N-	110-54-3	6.1E+02	ns	2.5E+03	ns	7.3E+02	n	3.1E+03	n	1.5E+03	n		1.0E+01	n	
				2.0E+00	P					1	0.1		Hexanedioic Acid	124-04-9	1.3E+05	nm	1.6E+06	nm					4.0E+04	n		9.9E+00	n	
9.5E-03	P			7.0E-02	P	4.0E-04	P	V		1		2.7E+02	Hexanol, 1-,2-ethyl- (2-Ethyl-1-hexanol)	104-76-7	1.5E+01	n	6.3E+01	n	4.2E-01	n	1.8E+00	n	8.3E-01	n		2.3E-04	n	
				5.0E-03	I	3.0E-02	I	V		1		3.3E+03	Hexanone, 2-	591-78-6	2.0E+02	n	1.3E+03	n	3.1E+01	n	1.3E+02	n	3.8E+01	n		8.8E-03	n	
				3.3E-02	I					1	0.1		Hexazinone	51235-04-2	2.1E+03	n	2.7E+04	n					6.4E+02	n		3.0E-01	n	
				2.5E-02	I					1	0.1		Hexythiazox	78587-05-0	1.6E+03	n	2.1E+04	n					1.1E+02	n		5.0E-01	n	
				1.7E-02	O					1	0.1		Hydramethylnon	67485-29-4	1.1E+03	n	1.4E+04	n					3.4E+02	n		1.2E+05	n	
3.0E+00	I	4.9E-03	I			3.0E-05	P	V		1		1.1E+05	Hydrazine	302-01-2	3.2E-02	c*	1.4E-01	c*	5.7E-04	c*	2.5E-03	c*	1.1E-03	c*		2.2E-07	c*	

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = OW; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; c = cancer; n = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded; V = volatile; M = mutagen.

Toxicity and Chemical-specific Information													Contaminant		Screening Levels											Protection of Groundwater SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tap Water (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
3.0E+00	I	4.9E-03	I							1			Hydrazine Sulfate	10034-93-2	2.3E-01	c	1.1E+00	c	5.7E-04	c	2.5E-03	c	2.6E-02	c				
						2.0E-02	I	V		1			Hydrogen Chloride	7647-01-0	2.8E+07	nm	1.2E+08	nm	2.1E+01	n	8.8E+01	n	4.2E+01	n				
				4.0E-02	C	1.4E-02	C	V		1			Hydrogen Fluoride	7664-39-3	3.1E+03	n	4.7E+04	n	1.5E+01	n	6.1E+01	n	2.8E+01	n				
						2.0E-03	I	V		1			Hydrogen Sulfide	7783-06-4	2.8E+06	nm	1.2E+07	nm	2.1E+00	n	8.8E+00	n	4.2E+00	n				
6.0E-02	P			4.0E-02	P					1	0.1		Hydroquinone	123-31-9	9.0E+00	c	3.8E+01	c					1.3E+00	c		8.7E-04	c	
6.1E-02	O			1.1E-01	O					1	0.1		Imazalil	35554-44-0	8.9E+00	c	3.8E+01	c					9.0E-01	c		1.5E-02	c	
				2.5E-01	I					1	0.1		Imazaquin	81335-37-7	1.6E+04	n	2.1E+05	nm					4.9E+03	n		2.4E+01	n	
				2.5E+00	O					1	0.1		Imazethapyr	81335-77-5	1.6E+05	nm	2.1E+06	nm					4.7E+04	n		4.1E+01	n	
				1.0E-02	A					1			Iodine	7553-56-2	7.8E+02	n	1.2E+04	n					2.0E+02	n		1.2E+01	n	
				4.0E-02	I					1	0.1		Iprodione	36734-19-7	2.5E+03	n	3.3E+04	n					7.4E+02	n		2.2E-01	n	
				7.0E-01	P					1			Iron	7439-89-6	5.5E+04	n	8.2E+05	nm					1.4E+04	n		3.5E+02	n	
				3.0E-01	I	4.0E-01	X	V		1		1.0E+04	Isobutyl Alcohol	78-83-1	7.8E+03	n	4.3E+04	ns	4.2E+02	n	1.8E+03	n	7.3E+02	n		1.5E-01	n	
9.5E-04	I			2.0E-01	I	2.0E+00	C			1	0.1		Isophorone	78-59-1	5.7E+02	c*	2.4E+03	c*	2.1E+03	n	8.8E+03	n	7.8E+01	c*		2.6E-02	c*	
				1.5E-02	I			V		1			Isopropalin	33820-53-0	1.2E+03	n	1.8E+04	n					4.0E+01	n		9.2E-01	n	
				2.0E+00	P	2.0E-01	P	V		1		1.1E+05	Isopropanol	67-63-0	5.6E+03	n	2.4E+04	n	2.1E+02	n	8.8E+02	n	4.1E+02	n		8.4E-02	n	
				1.0E-01	I					1	0.1		Isopropyl Methyl Phosphonic Acid	1832-54-8	6.3E+03	n	8.2E+04	n					2.0E+03	n		4.3E-01	n	
				5.0E-02	I					1	0.1		Isoxaben	82558-50-7	3.2E+03	n	4.1E+04	n					7.3E+02	n		2.0E+00	n	
						3.0E-01	A	V		1			JP-7	E1737665	4.3E+08	nm	1.8E+09	nm	3.1E+02	n	1.3E+03	n	6.3E+02	n				
				8.0E-03	O					1	0.1		Lactofen	77501-63-4	5.1E+02	n	6.6E+03	n					1.0E+02	n		4.6E+00	n	
				2.0E-04	X					1	0.1		Lactonitrile	78-97-7	1.3E+01	n	1.6E+02	n					4.0E+00	n		8.1E-04	n	
				5.0E-05	P					1			Lanthanum	7439-91-0	3.9E+00	n	5.8E+01	n					1.0E+00	n				
				2.1E-05	P					1	0.1		Lanthanum Acetate Hydrate	100587-90-4	1.3E+00	n	1.7E+01	n					4.2E-01	n				
				1.9E-05	P					1			Lanthanum Chloride Heptahydrate	10025-84-0	1.5E+00	n	2.2E+01	n					3.7E-01	n				
				2.8E-05	P					1			Lanthanum Chloride, Anhydrous	10099-58-8	2.2E+00	n	3.3E+01	n					5.7E-01	n				
				1.6E-05	P					1			Lanthanum Nitrate Hexahydrate	10277-43-7	1.3E+00	n	1.9E+01	n					3.2E-01	n				
													Lead Compounds															
8.5E-03	C	1.2E-05	C							1			~Lead Phosphate	7446-27-7	8.2E+01	c	3.8E+02	c	2.3E-01	c	1.0E+00	c	9.1E+00	c				
2.1E-01	C	8.0E-05	C							1	0.1		~Lead acetate	301-04-2	2.6E+00	c	1.1E+01	c	3.5E-02	c	1.5E-01	c	3.7E-01	c		7.5E-05	c	
										1			~Lead and Compounds	7439-92-1	4.0E+02	G	8.0E+02	G	1.5E-01	G			1.5E+01	G	1.5E+01			1.4E+01
3.8E-02	C	1.1E-05	C							1	0.1		~Lead subacetate	1335-32-6	1.4E+01	c	6.0E+01	c	2.6E-01	c	1.1E+00	c	2.1E+00	c		4.5E-04	c	
				1.0E-07	I			V		1		2.4E+00	~Tetraethyl Lead	78-00-2	7.8E-03	n	1.2E-01	n					1.3E-03	n		4.7E-06	n	
				5.0E-06	P			V		1		3.8E+02	Lewisite	541-25-3	3.9E-01	n	5.8E+00	n					9.0E-02	n		3.8E-05	n	
				7.7E-03	O					1	0.1		Linuron	330-55-2	4.9E+02	n	6.3E+03	n					1.3E+02	n		1.1E-01	n	
				2.0E-03	P					1			Lithium	7439-93-2	1.6E+02	n	2.3E+03	n					4.0E+01	n		1.2E+01	n	
				5.0E-04	I					1	0.1		MCPA	94-74-6	3.2E+01	n	4.1E+02	n					7.5E+00	n		2.0E-03	n	
				4.4E-02	O					1	0.1		MCPB	94-81-5	2.8E+03	n	3.6E+04	n					6.5E+02	n		2.6E-01	n	
				1.0E-03	I					1	0.1		MCPP	93-65-2	6.3E+01	n	8.2E+02	n					1.6E+01	n		4.7E-03	n	
				2.0E-02	I					1	0.1		Malathion	121-75-5	1.3E+03	n	1.6E+04	n					3.9E+02	n		1.0E-01	n	
				1.0E-01	I	7.0E-04	C			1	0.1		Maleic Anhydride	108-31-6	6.3E+03	n	8.0E+04	n	7.3E-01	n	3.1E+00	n	1.9E+03	n		3.8E-01	n	
				5.0E-01	I					1	0.1		Maleic Hydrazide	123-33-1	3.2E+04	n	4.1E+05	nm					1.0E+04	n		2.1E+00	n	
				1.0E-04	P					1	0.1		Malononitrile	109-77-3	6.3E+00	n	8.2E+01	n					2.0E+00	n		4.1E-04	n	
				3.0E-02	H					1	0.1		Mancozeb	8018-01-7	1.9E+03	n	2.5E+04	n					5.4E+02	n		7.6E-01	n	
				5.0E-03	I					1	0.1		Maneb	12427-38-2	3.2E+02	n	4.1E+03	n					9.8E+01	n		1.4E-01	n	
				1.4E-01	I	5.0E-05	I			1			Manganese (Diet)	7439-96-5					5.2E-02	n	2.2E-01	n						
				2.4E-02	G	5.0E-05	I			0.04			Manganese (Non-diet)	7439-96-5	1.8E+03	n	2.6E+04	n	5.2E-02	n	2.2E-01	n	4.3E+02	n		2.8E+01	n	
				9.0E-05	H					1	0.1		Mephosfolan	950-10-7	5.7E+00	n	7.4E+01	n					1.8E+00	n		2.6E-03	n	
				3.0E-02	I					1	0.1		Mepiquat Chloride	24307-26-4	1.9E+03	n	2.5E+04	n					6.0E+02	n		2.0E-01	n	
1.1E-02	P			4.0E-03	P					1	0.1		Mercaptobenzothiazole, 2-	149-30-4	4.9E+01	c**	2.1E+02	c*					6.3E+00	c*		1.8E-02	c*	
													Mercury Compounds															
				3.0E-04	I	3.0E-04	G			0.07			~Mercuric Chloride (and other Mercury salts)	7487-94-7	2.3E+01	n	3.5E+02	n	3.1E-01	n	1.3E+00	n	5.7E+00	n	2.0E+00			
						3.0E-04	I	V		1		3.1E+00	~Mercury (elemental)	7439-97-6	1.1E+01	ns	4.6E+01	ns	3.1E-01	n	1.3E+00	n	6.3E-01	n	2.0E+00	3.3E-02	n	1.0E-01
				1.0E-04	I					1			~Methyl Mercury	22967-92-6	7.8E+00	n	1.2E+02	n					2.0E+00	n		1.4E+01	n	
				8.0E-05	I					1	0.1		~Phenylmercuric Acetate	62-38-4	5.1E+00	n	6.6E+01	n					1.6E+00	n		5.0E-04	n	
				3.0E-05	I			V		1			Merphos	150-50-5	2.3E+00	n	3.5E+01	n					6.0E-01	n		5.9E-02	n	
				6.0E-02	I					1	0.1		Metalaxyl	57837-19-1	3.8E+03	n	4.9E+04	n					1.2E+03	n		3.3E-01	n	
				1.0E-04	I	3.0E-02	P	V		1		4.6E+03	Methacrylonitrile	126-98-7	7.5E+00	n	1.0E+02	n	3.1E+01	n	1.3E+02	n	1.9E+00	n		4.3E-04	n	
				5.0E-05	I					1	0.1		Methamidophos	10265-92-6	3.2E+00	n	4.1E+01	n					1.0E+00	n		2.1E-04	n	
				2.0E+00	I	2.0E+01	I	V		1		1.1E+05	Methanol	67-56-1	1.2E+05	nms	1.2E+06	nms	2.1E+04	n	8.8E+04	n	2.0E+04	n		4.1E+00	n	
				1.5E-03	O					1	0.1		Methidathion	950-37-8	9.5E+01	n	1.2E+03	n					2.9E+01	n		7.1E-03	n	
				2.5E-02	I					1	0.1		Methomyl	16752-77-5	1.6E+03	n	2.1E+04	n					5.0E+02	n		1.1E-01	n	
4.9E-02	C									1	0.1		Methoxy-5-nitroaniline, 2-	99-59-2	1.1E+01	c	4.7E+01	c					1.5E+00	c		5.3E-04	c	
				5.0E-03	I					1	0.1		Methoxychlor	72-43-5	3.2E+02	n	4.1E+03	n					3.7E+01	n	4.0E+01	2.0E+00	n	2.2E+00
				8.0E-03	P	1.0E-03	P	V		1		1.2E+05	Methoxyethanol Acetate, 2-	110-49-6	1.1E+02	n	5.1E+02	n	1.0E+00	n	4.4E+00	n	2.1E+00	n		4.2E-04	n	
				5.0E-03	P	7.0E-03	P	V		1		1.1E+05	Methoxyethanol, 2-	109-86-4	2.6E+02	n	2.0E+03	n	7.3E+00	n	3.1E+01	n	1.3E+01	n		2.6E-03	n	
				1.0E+00	X			V		1		2.9E+04	Methyl Acetate	79-20-9	7.8E+04	ns	1.2E+06	nms					2.0E+04	n		4.1E+00	n	
						2.0E-02	P	V		1		6.8E+03	Methyl Acrylate	96-33-3	1.5E+02	n	6.1E+02	n	2.1E+01	n	8.8E+01	n	4.2E+01	n		8.9E-03	n	
				6.0E-01	I	5.0E+00	I	V		1		2.8E+04	Methyl Ethyl Ketone (2-Butanone)	78-93-3	2.7E+04	n	1.9E+05	nms	5.2E+03	n	2.2E+04	n	5.6E+03	n		1.2E+00	n	
		1.0E-03	X	1.0E-03	P	2.0E-05	X	V		1		1.8E+05	Methyl Hydrazine	60-34-4	1.4E-01	c**	6.2E-01	c**	2.8E-03	c**	1.2E-02	c**	5.6E-03	c**		1.3E-06	c**	
						3.0E+00	I	V		1		3.4E+03	Methyl Isobutyl Ketone (4-methyl-2-pentanone)	108-10-1	3.3E+04	ns	1.4E+05	nms	3.1E+03	n	1.3E+04	n	6.3E+03	n		1.4E+00	n	
						1.0E-03	C	V		1		1.0E+04	Methyl Isocyanate	624-83-9	4.6E+00	n	1.9E+01	n	1.0E+00	n	4.4E+00	n	2.1E+00	n		5.9E-04	n	
				1.4E+00	I	7.0E-01	I	V		1		2.4E+03	Methyl Methacrylate	80-62-6	4.4E+03	ns	1.9E+04	ns	7.3E+02	n	3.1E+03	n	1.4E+03	n		3.0E-01	n	
				2.5E-04	I					1	0.1		Methyl Parathion	298-00-0	1.6E+01	n	2.1E+02	n					4.5E+00	n		7.4E-03	n	
				6.0E-02	X					1	0.1		Methyl Phosphonic Acid	993-13-5	3.8E+03	n	4.9E+04	n					1.2E+03	n		2.4E-01	n	
				6.0E-03	H	4.0E-02	H	V		1		3.9E+02	Methyl Styrene (Mixed Isomers)	25013-15-4	3.2E+02	n	2.6E+03	ns	4.2E+01	n	1.8E+02	n	2.3E+01	n		3.8E-02	n	
9.9E-02	C	2.8E-05	C							1	0.1		Methyl methanesulfonate	66-27-3	5.5E+00	c	2.3E+01	c	1.0E-01	c	4.4E-01	c	7.9E-01	c		1.6E-04	c	
1.8E-03	C	2.6E-07	C			3.0E+00	I	V		1		8.9E+03	Methyl tert-Butyl Ether (MTBE)	1634-04-4	4.7E+01	c	2.1E+02	c	1.1E+01	c	4.7E+01	c	1.4E+01	c		3.2E-03	c	
				3.0E-04	X					1	0.1		Methyl-1,4-benzenediamine dihydrochloride, 2-	615-45-2	1.9E+01	n	2.5E+02	n					6.0E+00	n		3.6E-03	n	
						3.0E+00	X	V		1		2.5E+03	Methyl-2-Pentanol, 4-	108-11-2	5.4E+04	ns	2.3E+05	nms	3.1E+03	n	1.3E+04	n	6.3E+03	n		1.4E+00	n	

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = OW; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; c = cancer; n = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded; V = volatile; M = mutagen.

Toxicity and Chemical-specific Information													Contaminant		Screening Levels											Protection of Groundwater SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tap Water (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
9.0E-03	P			2.0E-02	X					1	0.1		Methyl-5-Nitroaniline, 2-	99-55-8	6.0E+01	c*	2.6E+02	c*					8.2E+00	c*		4.6E-03	c*	
8.3E+00	C	2.4E-03	C							1	0.1		Methyl-N-nitro-N-nitrosoguanidine, N-	70-25-7	6.5E-02	c	2.8E-01	c	1.2E-03	c	5.1E-03	c	9.4E-03	c		3.2E-06	c	
1.3E-01	C	3.7E-05	C							1	0.1		Methylaniline Hydrochloride, 2-	636-21-5	4.2E+00	c	1.8E+01	c	7.6E-02	c	3.3E-01	c	6.0E-01	c		2.6E-04	c	
				1.0E-02	A					1	0.1		Methylarsonic acid	124-58-3	6.3E+02	n	8.2E+03	n					2.0E+02	n		5.8E-02	n	
				2.0E-04	X					1	0.1		Methylbenzene,1-4-diamine monohydrochloride, 2-	74612-12-7	1.3E+01	n	1.6E+02	n					4.0E+00	n				
1.0E-01	X			3.0E-04	X					1	0.1		Methylbenzene-1,4-diamine sulfate, 2-	615-50-9	5.4E+00	c**	2.3E+01	c*					7.8E-01	c**				
2.2E+01	C	6.3E-03	C						M	1	0.1		Methylcholanthrene, 3-	56-49-5	5.5E-03	c	1.0E-01	c	1.6E-04	c	1.9E-03	c	1.1E-03	c		2.2E-03	c	
2.0E-03	I	1.0E-08	I	6.0E-03	I	6.0E-01	I	V	M	1		3.3E+03	Methylene Chloride	75-09-2	5.7E+01	c**	1.0E+03	c**	1.0E+02	c**	1.2E+03	c**	1.1E+01	c**	5.0E+00	2.9E-03	c**	1.3E-03
1.0E-01	P	4.3E-04	C	2.0E-03	P				M	1	0.1		Methylene-bis(2-chloroaniline), 4,4'-	101-14-4	1.2E+00	c	2.3E+01	c*	2.4E-03	c	2.9E-02	c	1.6E-01	c		1.8E-03	c	
4.6E-02	I	1.3E-05	C							1	0.1		Methylene-bis(N,N-dimethyl) Aniline, 4,4'-	101-61-1	1.2E+01	c	5.0E+01	c	2.2E-01	c	9.4E-01	c	7.0E-01	c		3.9E-03	c	
1.6E+00	C	4.6E-04	C			2.0E-02	C			1	0.1		Methylenebisbenzenamine, 4,4'-	101-77-9	3.4E-01	c	1.4E+00	c	6.1E-03	c	2.7E-02	c	4.7E-02	c		2.1E-04	c	
						6.0E-04	I			1	0.1		Methylenediphenyl Diisocyanate	101-68-8	8.5E+05	nm	3.6E+06	nm	6.3E-01	n	2.6E+00	n						
				7.0E-02	H			V		1		5.0E+02	Methylstyrene, Alpha-	98-83-9	5.5E+03	ns	8.2E+04	ns					7.8E+02	n		1.2E+00	n	
				1.5E-01	I					1	0.1		Metolachlor	51218-45-2	9.5E+03	n	1.2E+05	nm					2.7E+03	n		3.2E+00	n	
				2.5E-02	I					1	0.1		Metribuzin	21087-64-9	1.6E+03	n	2.1E+04	n					4.9E+02	n		1.5E-01	n	
				2.5E-01	I					1	0.1		Metsulfuron-methyl	74223-64-6	1.6E+04	n	2.1E+05	nm					4.9E+03	n		1.9E+00	n	
		4.5E-06	X	1.0E-02	X	1.0E-01	P	V		1		6.9E+00	Midrange Aliphatic Hydrocarbon Streams	E1790669	6.5E-01	c	2.8E+00	c	6.2E-01	c	2.7E+00	c	1.2E+00	c*		1.8E-02	c*	
				3.0E+00	P			V		1		3.4E-01	Mineral oils	8012-95-1	2.3E+05	nms	3.5E+06	nms					6.0E+04	n		2.4E+03	n	
1.8E+01	C	5.1E-03	C	2.0E-04	I			V		1			Mirex	2385-85-5	3.6E-02	c	1.7E-01	c	5.5E-04	c	2.4E-03	c	8.8E-04	c		6.3E-04	c	
				2.0E-03	I					1	0.1		Molinate	2212-67-1	1.3E+02	n	1.6E+03	n					3.0E+01	n		1.7E-02	n	
				5.0E-03	I	2.0E-03	A			1			Molybdenum	7439-98-7	3.9E+02	n	5.8E+03	n	2.1E+00	n	8.8E+00	n	1.0E+02	n		2.0E+00	n	
				1.0E-01	I					1			Monochloramine	10599-90-3	7.8E+03	n	1.2E+05	nm					2.0E+03	n	4.0E+03(G)			
				2.0E-03	P					1	0.1		Monomethylaniline	100-61-8	1.3E+02	n	1.6E+03	n					3.8E+01	n		1.4E-02	n	
				2.5E-02	I					1	0.1		Myclobutanil	88671-89-0	1.6E+03	n	2.1E+04	n					4.5E+02	n		5.6E+00	n	
				3.0E-04	X					1	0.1		N,N'-Diphenyl-1,4-benzenediamine	74-31-7	1.9E+01	n	2.5E+02	n					3.6E+00	n		3.7E-01	n	
				2.0E-03	I			V		1			Naled	300-76-5	1.6E+02	n	2.3E+03	n					4.0E+01	n		1.8E-02	n	
				3.0E-02	X	1.0E-01	P	V		1			Naphtha, High Flash Aromatic (HFAN)	64742-95-6	2.3E+03	n	3.5E+04	n	1.0E+02	n	4.4E+02	n	1.5E+02	n				
1.8E+00	C	0.0E+00	C							1	0.1		Naphthylamine, 2-	91-59-8	3.0E-01	c	1.3E+00	c					3.9E-02	c		2.0E-04	c	
				1.2E-01	O					1	0.1		Napropamide	15299-99-7	7.6E+03	n	9.8E+04	n					2.0E+03	n		1.3E+01	n	
		2.6E-04	C	1.1E-02	C	1.4E-05	C			1	0.1		Nickel Acetate	373-02-4	6.7E+02	n	8.1E+03	n	1.1E-02	c**	4.7E-02	c**	2.2E+02	n		4.5E-02	n	
		2.6E-04	C	1.1E-02	C	1.4E-05	C			1	0.1		Nickel Carbonate	3333-67-3	6.7E+02	n	8.1E+03	n	1.1E-02	c**	4.7E-02	c**	2.2E+02	n				
		2.6E-04	C	1.1E-02	C	1.4E-05	C	V		1			Nickel Carbonyl	13463-39-3	8.2E+02	n	1.1E+04	n	1.1E-02	c**	4.7E-02	c**	2.2E-02	c**				
		2.6E-04	C	1.1E-02	C	1.4E-05	C			0.04			Nickel Hydroxide	12054-48-7	8.2E+02	n	1.1E+04	n	1.1E-02	c**	4.7E-02	c**	2.0E+02	n				
		2.6E-04	C	1.1E-02	C	2.0E-05	C			0.04			Nickel Oxide	1313-99-1	8.4E+02	n	1.2E+04	n	1.1E-02	c**	4.7E-02	c**	2.0E+02	n				
		2.4E-04	I	1.1E-02	C	1.4E-05	C			0.04			Nickel Refinery Dust	E715532	8.2E+02	n	1.1E+04	n	1.2E-02	c**	5.1E-02	c**	2.2E+02	n		3.2E+01	n	
		2.6E-04	C	2.0E-02	I	9.0E-05	A			0.04			Nickel Soluble Salts	7440-02-0	1.5E+03	n	2.2E+04	n	1.1E-02	c**	4.7E-02	c**	3.9E+02	n		2.6E+01	n	
1.7E+00	C	4.8E-04	I	1.1E-02	C	1.4E-05	C			0.04			Nickel Subsulfide	12035-72-2	4.1E-01	c	1.9E+00	c	5.8E-03	c**	2.6E-02	c**	4.5E-02	c				
9.1E-01	C	2.6E-04	C	1.1E-02	C	1.4E-05	C			1	0.1		Nickelocene	1271-28-9	6.0E-01	c	2.5E+00	c	1.1E-02	c**	4.7E-02	c**	8.6E-02	c				
				1.6E+00	I					1			Nitrate (measured as nitrogen)	14797-55-8	1.3E+05	nm	1.9E+06	nm					3.2E+04	n	1.0E+04			
										1			Nitrate + Nitrite (measured as nitrogen)	E701177											1.0E+04			
				1.0E-01	I					1			Nitrite (measured as nitrogen)	14797-65-0	7.8E+03	n	1.2E+05	nm					2.0E+03	n	1.0E+03			
				1.0E-02	X	5.0E-05	X			1	0.1		Nitroaniline, 2-	88-74-4	6.3E+02	n	8.0E+03	n	5.2E-02	n	2.2E-01	n	1.9E+02	n		8.0E-02	n	
2.0E-02	P			4.0E-03	P	6.0E-03	P			1	0.1		Nitroaniline, 4-	100-01-6	2.7E+01	c**	1.1E+02	c*	6.3E+00	n	2.6E+01	n	3.8E+00	c*		1.6E-03	c*	
		4.0E-05	I	2.0E-03	I	9.0E-03	I	V		1		3.1E+03	Nitrobenzene	98-95-3	5.1E+00	c*	2.2E+01	c*	7.0E-02	c	3.1E-01	c	1.4E-01	c*		9.2E-05	c*	
				3.0E+03	P					1	0.1		Nitrocellulose	9004-70-0	1.9E+08	nm	2.5E+09	nm					6.0E+07	n		1.3E+04	n	
				7.0E-02	H					1	0.1		Nitrofurantoin	67-20-9	4.4E+03	n	5.7E+04	n					1.4E+03	n		6.1E-01	n	
1.3E+00	C	3.7E-04	C							1	0.1		Nitrofurazone	59-87-0	4.2E-01	c	1.8E+00	c	7.6E-03	c	3.3E-02	c	6.0E-02	c		5.4E-05	c	
1.7E-02	P			1.0E-04	P					1	0.1		Nitroglycerin	55-63-0	6.3E+00	n	8.2E+01	n					2.0E+00	n		8.5E-04	n	
				1.0E-01	I					1	0.1		Nitroguanidine	556-88-7	6.3E+03	n	8.2E+04	n					2.0E+03	n		4.8E-01	n	
		8.8E-06	P			5.0E-03	P	V		1		1.8E+04	Nitromethane	75-52-5	5.4E+00	c*	2.4E+01	c*	3.2E-01	c*	1.4E+00	c*	6.4E-01	c*		1.4E-04	c*	
		5.8E-04	X			2.0E-02	I	V		1		4.9E+03	Nitropropane, 2-	79-46-9	6.4E-02	c	2.8E-01	c	4.8E-03	c	2.1E-02	c	9.7E-03	c		2.5E-06	c	
2.7E+01	C	7.7E-03	C						M	1	0.1		Nitroso-N-ethylurea, N-	759-73-9	4.5E-03	c	8.5E-02	c	1.3E-04	c	1.6E-03	c	9.2E-04	c		2.2E-07	c	
1.2E+02	C	3.4E-02	C						M	1	0.1		Nitroso-N-methylurea, N-	684-93-5	1.0E-03	c	1.9E-02	c	3.0E-05	c	3.6E-04	c	2.1E-04	c		4.6E-08	c	
5.4E+00	I	1.6E-03	I					V		1			Nitroso-di-N-butylamine, N-	924-16-3	9.9E-02	c	4.6E-01	c	1.8E-03	c	7.7E-03	c	2.7E-03	c		5.5E-06	c	
7.0E+00	I	2.0E-03	C							1	0.1		Nitroso-di-N-propylamine, N-	621-64-7	7.8E-02	c	3.3E-01	c	1.4E-03	c	6.1E-03	c	1.1E-02	c		8.1E-06	c	
2.8E+00	I	8.0E-04	C							1	0.1		Nitrosodiethanolamine, N-	1116-54-7	1.9E-01	c	8.2E-01	c	3.5E-03	c	1.5E-02	c	2.8E-02	c		5.6E-06	c	
1.5E+02	I	4.3E-02	I						M	1	0.1		Nitrosodiethylamine, N-	55-18-5	8.1E-04	c	1.5E-02	c	2.4E-05	c	2.9E-04	c	1.7E-04	c		6.1E-08	c	
5.1E+01	I	1.4E-02	I	8.0E-06	P	4.0E-05	X	V	M	1		2.4E+05	Nitrosodimethylamine, N-	62-75-9	2.0E-03	c	3.4E-02	c	7.2E-05	c	8.8E-04	c	1.1E-04	c		2.7E-08	c	
4.9E-03	I	2.6E-06	C							1	0.1		Nitrosodiphenylamine, N-	86-30-6	1.1E+02	c	4.7E+02	c	1.1E+00	c	4.7E+00	c	1.2E+01	c		6.7E-02	c	
2.2E+01	I	6.3E-03	C					V		1		1.1E+05	Nitrosomethylethylamine, N-	10595-95-6	2.0E-02	c	9.1E-02	c	4.5E-04	c	1.9E-03	c	7.1E-04	c		2.0E-07	c	
6.7E+00	C	1.9E-03	C							1	0.1		Nitrosomorpholine [N-]	59-89-2	8.1E-02	c	3.4E-01	c	1.5E-03	c	6.5E-03	c	1.2E-02	c		2.8E-06	c	
9.4E+00	C	2.7E-03	C							1	0.1		Nitrosopiperidine [N-]	100-75-4	5.8E-02	c	2.4E-01	c	1.0E-03	c	4.5E-03	c	8.2E-03	c		4.4E-06	c	
2.1E+00	I	6.1E-04	I							1	0.1		Nitrosopyrrolidine, N-	930-55-2	2.6E-01	c	1.1E+00	c	4.6E-03	c	2.0E-02	c	3.7E-02	c		1.4E-05	c	
				1.0E-04	X					1	0.1		Nitrotoluene, m-	99-08-1	6.3E+00	n	8.2E+01	n					1.7E+00	n		1.6E-03	n	
2.2E-01	P			9.0E-04	P			V		1		1.5E+03	Nitrotoluene, o-	88-72-2	3.2E+00	c*	1.5E+01	c*					3.1E-01	c*		3.0E-04	c*	
1.6E-02	P			4.0E-03	P					1	0.1		Nitrotoluene, p-	99-99-0	3.4E+01	c**	1.4E+02	c*					4.3E+00	c*		4.0E-03	c*	
				3.0E-04	X	2.0E-02	P	V		1		6.9E+00	Nonane, n-	111-84-2	1.1E+01	ns	7.2E+01	ns	2.1E+01	n	8.8E+01	n	5.3E+00	n		7.5E-02	n	
				1.5E-03	O					1	0.1		Norflurazon	27314-13-2	9.5E+01	n	1.2E+03	n					2.9E+01	n		1.9E-01	n	
				3.0E-03	I					1	0.1		Octabromodiphenyl Ether	32536-52-0	1.9E+02	n	2.5E+03	n					6.0E+01	n		1.2E+01	n	
				5.0E-02	I					1	0.006		Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	2691-41-0	3.9E+03	n	5.7E+04	n					1.0E+03	n		1.3E+00	n	
				2.0E-03	H					1	0.1		Octamethylpyrophosphoramide	152-16-9	1.3E+02	n	1.6E+03	n					4.0E+01	n		9.6E-03	n	
7.8E-03	O			1.9E-01	O					1	0.1		Oryzalin	19044-88-3	7.0E+01	c	2.9E+02	c					7.9E+00	c		1.5E-02	c	
				5.0E-03	I					1	0.1		Oxadiazon	19666-30-9	3.2E+02	n	4.1E+03	n					4.7E+01	n		4.8E-01	n	
				2.5E-02	I					1	0.1		Oxamyl	23135-22-0	1.6E+03	n	2.1E+04	n					5.0E+02	n	2.0E+02	1.1E-01	n	4.4E-02
7.3E-02	O			4.0E-02	O					1	0.1		Oxyfluorfen	42874-03-3	7.4E+00	c	3.1E+01	c					5.4E-01	c		4.3E-02	c	
				1.3E-02	I					1	0.1		Paclobutrazol	76738-62-0	8.2E+02	n	1.1E+04	n					2.3E+02	n		4.6E-01	n	
				4.5E-03	I					1	0.1		Paraquat Dichloride	1910-42-5	2.8E+02	n	3.7E+03	n					9.0E+01	n		1.2E+00	n	
				6.0E-03	H					1	0.1		Parathion	56-38-2	3.8E+02	n	4.9E+03	n					8.6E+01	n		4.3E-01	n	

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = OW; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; c = cancer; n = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded; V = volatile; M = mutagen.

Toxicity and Chemical-specific Information														Contaminant		Screening Levels											Protection of Groundwater SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tap Water (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
				5.0E-02	H			V		1			Pebulate	1114-71-2	3.9E+03	n	5.8E+04	n					5.6E+02	n		4.5E-01	n	
				3.0E-01	O					1	0.1		Pendimethalin	40487-42-1	1.9E+04	n	2.5E+05	nm					1.4E+03	n		1.6E+01	n	
				2.0E-03	I			V		1		3.1E-01	Pentabromodiphenyl Ether	32534-81-9	1.6E+02	ns	2.3E+03	ns					4.0E+01	n		1.7E+00	n	
				1.0E-04	I					1	0.1		Pentabromodiphenyl ether, 2,2',4,4',5- (BDE-99)	60348-60-9	6.3E+00	n	8.2E+01	n					2.0E+00	n		8.7E-02	n	
				8.0E-04	I			V		1			Pentachlorobenzene	608-93-5	6.3E+01	n	9.3E+02	n					3.2E+00	n		2.4E-02	n	
9.0E-02	P							V		1		4.6E+02	Pentachloroethane	76-01-7	7.7E+00	c	3.6E+01	c					6.5E-01	c		3.1E-04	c	
2.6E-01	H			3.0E-03	I			V		1			Pentachloronitrobenzene	82-68-8	2.7E+00	c*	1.3E+01	c					1.2E-01	c		1.5E-03	c	
4.0E-01	I	5.1E-06	C	5.0E-03	I					1	0.25		Pentachlorophenol	87-86-5	1.0E+00	c	4.0E+00	c	5.5E-01	c	2.4E+00	c	4.1E-02	c	1.0E+00	5.7E-05	c	1.4E-03
4.3E-03	X			9.0E-03	P					1	0.1		Pentaerythritol tetranitrate (PETN)	78-11-5	1.3E+02	c**	5.3E+02	c*					1.7E+01	c**		2.6E-02	c**	
				1.0E-04	X					1	0.1		Pentamethylphosphoramide (PMPA)	10159-46-3	6.3E+00	n	8.2E+01	n					2.0E+00	n		4.1E-04	n	
						1.0E+00	P	V		1		3.9E+02	Pentane, n-	109-66-0	8.1E+02	ns	3.4E+03	ns	1.0E+03	n	4.4E+03	n	2.1E+03	n		1.0E+01	n	
													Per- and Polyfluoroalkyl Substances (PFAS)																
				3.0E-06	D					1	0.1		~Ammonium perfluoro-2-methyl-3-oxahexanoate	62037-80-3	1.9E-01	n	2.5E+00	n					6.0E-02	n		1.3E-05	n	
				1.0E-03	I					1	0.1		~Ammonium perfluorobutanoate	10495-86-0	6.3E+01	n	8.2E+02	n					2.0E+01	n		7.1E-03	n	
				5.0E-04	I			V		1			~Ammonium perfluorohexanoate	21615-47-4	3.9E+01	n	5.8E+02	n					7.2E+00	n		1.7E-02	n	
				3.0E-06	D			V		1			~Hexafluoropropylene oxide dimer acid (HFPO-DA)	13252-13-6	2.3E-01	n	3.5E+00	n					6.0E-02	n				
				3.0E-04	P					1	0.1		~Perfluorobutanesulfonate	45187-15-3	1.9E+01	n	2.5E+02	n					6.0E+00	n		1.9E-03	n	
				3.0E-04	P					1	0.1		~Perfluorobutanesulfonic acid (PFBS)	375-73-5	1.9E+01	n	2.5E+02	n					6.0E+00	n		1.9E-03	n	
				1.0E-03	I			V		1		9.3E+04	~Perfluorobutanoate	45048-62-2	7.8E+01	n	1.2E+03	n					1.8E+01	n		6.7E-03	n	
				1.0E-03	I			V		1		2.6E+03	~Perfluorobutanoic acid (PFBA)	375-22-4	7.8E+01	n	1.2E+03	n					1.8E+01	n		6.5E-03	n	
				2.0E-05	A					1	0.1		~Perfluorohexanesulfonate	108427-53-8	1.3E+00	n	1.6E+01	n					3.9E-01	n		1.7E-04	n	
				2.0E-05	A					1	0.1		~Perfluorohexanesulfonic acid (PFHxS)	355-46-4	1.3E+00	n	1.6E+01	n					3.9E-01	n		1.7E-04	n	
				5.0E-04	I			V		1		6.8E+03	~Perfluorohexanoate	92612-52-7	3.9E+01	n	5.8E+02	n					6.1E+00	n		1.4E-02	n	
				5.0E-04	I					1	0.1		~Perfluorohexanoic acid (PFHxA)	307-24-4	3.2E+01	n	4.1E+02	n					9.9E+00	n		2.4E-03	n	
				3.0E-06	A					1	0.1		~Perfluorononanoate	72007-68-2	1.9E-01	n	2.5E+00	n					5.9E-02	n		2.5E-04	n	
				3.0E-06	A					1	0.1		~Perfluorononanoic acid (PFNA)	375-95-1	1.9E-01	n	2.5E+00	n					5.9E-02	n		2.5E-04	n	
				2.0E-06	A					1	0.1		~Perfluorooctanesulfonate	45298-90-6	1.3E-01	n	1.6E+00	n					4.0E-02	n		3.8E-05	n	
				2.0E-06	A					1	0.1		~Perfluorooctanesulfonic acid (PFOS)	1763-23-1	1.3E-01	n	1.6E+00	n					4.0E-02	n		3.1E-04	n	
7.0E-02	D			3.0E-06	A					1	0.1		~Perfluorooctanoate	45285-51-6	1.9E-01	n	2.5E+00	n					6.0E-02	n		9.1E-04	n	
7.0E-02	D			3.0E-06	A					1	0.1		~Perfluorooctanoic acid (PFOA)	335-67-1	1.9E-01	n	2.5E+00	n					6.0E-02	n		9.1E-04	n	
				2.0E-03	I			V		1		1.1E+05	~Potassium heptafluorobutanoate	2966-54-3	1.6E+02	n	2.3E+03	n					3.8E+01	n		1.4E-02	n	
				3.0E-04	P					1	0.1		~Potassium perfluorobutanesulfonate	29420-49-3	1.9E+01	n	2.5E+02	n					6.0E+00	n		3.0E-03	n	
				2.0E-06	A					1	0.1		~Potassium perfluorooctanesulfonate	2795-39-3	1.3E-01	n	1.6E+00	n					4.0E-02	n		3.1E-04	n	
				1.0E-03	I			V		1		1.0E+05	~Sodium perfluorobutanoate	2218-54-4	7.8E+01	n	1.2E+03	n					1.8E+01	n		6.8E-03	n	
				5.0E-04	I			V		1			~Sodium perfluorohexanoate	2923-26-4	3.9E+01	n	5.8E+02	n					1.0E+01	n		2.3E-02	n	
													Perchlorates																
				7.0E-04	I					1			~Ammonium Perchlorate	7790-98-9	5.5E+01	n	8.2E+02	n					1.4E+01	n				
				7.0E-04	I					1			~Lithium Perchlorate	7791-03-9	5.5E+01	n	8.2E+02	n					1.4E+01	n				
				7.0E-04	I					1			~Perchlorate and Perchlorate Salts	14797-73-0	5.5E+01	n	8.2E+02	n					1.4E+01	n	1.5E+01(G)			
				7.0E-04	I					1			~Potassium Perchlorate	7778-74-7	5.5E+01	n	8.2E+02	n					1.4E+01	n				
				7.0E-04	I					1			~Sodium Perchlorate	7601-89-0	5.5E+01	n	8.2E+02	n					1.4E+01	n				
				5.0E-02	I					1	0.1		Permethrin	52645-53-1	3.2E+03	n	4.1E+04	n					1.0E+03	n		2.4E+02	n	
2.2E-03	C	6.3E-07	C							1	0.1		Phenacetin	62-44-2	2.5E+02	c	1.0E+03	c	4.5E+00	c	1.9E+01	c	3.4E+01	c		9.7E-03	c	
				2.4E-01	O					1	0.1		Phenmedipham	13684-63-4	1.5E+04	n	2.0E+05	nm					3.8E+03	n		2.1E+01	n	
				3.0E-01	I	2.0E-01	C			1	0.1		Phenol	108-95-2	1.9E+04	n	2.5E+05	nm	2.1E+02	n	8.8E+02	n	5.8E+03	n		3.3E+00	n	
				4.0E-03	I					1	0.1		Phenol, 2-(1-methylethoxy)-, methylcarbamate	114-26-1	2.5E+02	n	3.3E+03	n					7.8E+01	n		2.5E-02	n	
				5.0E-04	X					1	0.1		Phenothiazine	92-84-2	3.2E+01	n	4.1E+02	n					4.3E+00	n		1.4E-02	n	
				2.0E-04	X			V		1		1.3E+02	Phenyl Isothiocyanate	103-72-0	1.6E+01	n	2.3E+02	ns					2.6E+00	n		1.7E-03	n	
				6.0E-03	I					1	0.1		Phenylenediamine, m-	108-45-2	3.8E+02	n	4.9E+03	n					1.2E+02	n		3.2E-02	n	
1.2E-01	P			4.0E-03	P					1	0.1		Phenylenediamine, o-	95-54-5	4.5E+00	c*	1.9E+01	c					6.5E-01	c		1.7E-04	c	
				1.0E-03	X					1	0.1		Phenylenediamine, p-	106-50-3	6.3E+01	n	8.2E+02	n					2.0E+01	n		5.4E-03	n	
1.9E-03	H									1	0.1		Phenylphenol, 2-	90-43-7	2.8E+02	c	1.2E+03	c					3.0E+01	c		4.1E-01	c	
				2.0E-04	H					1	0.1		Phorate	298-02-2	1.3E+01	n	1.6E+02	n					3.0E+00	n		3.4E-03	n	
						3.0E-04	I	V		1		1.6E+03	Phosgene	75-44-5	3.1E-01	n	1.3E+00	n	3.1E-01	n	1.3E+00	n	6.3E-01	n		1.6E-04	n	
				2.0E-02	I					1	0.1		Phosmet	732-11-6	1.3E+03	n	1.6E+04	n					3.7E+02	n		8.2E-02	n	
													Phosphates, Inorganic																
				1.0E+00	P					1			~Dipotassium phosphate	7758-11-4	7.8E+04	n	1.2E+06	nm					2.0E+04	n				
				1.0E+00	P					1			~Disodium phosphate	7558-79-4	7.8E+04	n	1.2E+06	nm					2.0E+04	n				
				1.0E+00	P					1			~Monopotassium phosphate	7778-77-0	7.8E+04	n	1.2E+06	nm					2.0E+04	n				
				1.0E+00	P					1			~Monosodium phosphate	7558-80-7	7.8E+04	n	1.2E+06	nm					2.0E+04	n				
				1.0E+00	P					1			~Polyphosphoric acid	8017-16-1	7.8E+04	n	1.2E+06	nm					2.0E+04	n				
				1.0E+00	P					1	0.1		~Potassium salts of inorganic phosphates		6.3E+04	n	8.2E+05	nm					2.0E+04	n				
				1.0E+00	P					1			~Potassium tripolyphosphate	13845-36-8	7.8E+04	n	1.2E+06	nm					2.0E+04	n				
				1.0E+00	P					1			~Sodium acid pyrophosphate	7758-16-9	7.8E+04	n	1.2E+06	nm					2.0E+04	n				
				1.0E+00	P					1			~Sodium hexametaphosphate	10124-56-8	7.8E+04	n	1.2E+06	nm					2.0E+04	n				
				1.0E+00	P					1			~Sodium polyphosphate	68915-31-1	7.8E+04	n	1.2E+06	nm					2.0E+04	n				
				1.0E+00	P					1	0.1		~Sodium salts of inorganic phosphates		6.3E+04	n	8.2E+05	nm					2.0E+04	n				
				1.0E+00	P					1			~Sodium trimetaphosphate	7785-84-4	7.8E+04	n	1.2E+06	nm					2.0E+04	n				
				1.0E+00	P					1			~Sodium tripolyphosphate	7758-29-4	7.8E+04	n	1.2E+06	nm					2.0E+04	n				
				1.0E+00	P					1			~Tetrapotassium phosphate	7320-34-5	7.8E+04	n	1.2E+06	nm					2.0E+04	n				
				1.0E+00	P					1			~Tetrasodium pyrophosphate	7722-88-5	7.8E+04	n	1.2E+06	nm					2.0E+04	n				
				1.0E+00	P					1			~Tripotassium phosphate	7778-53-2	7.8E+04	n	1.2E+06	nm					2.0E+04	n				
				1.0E+00	P					1			~Trisodium phosphate	7601-54-9	7.8E+04	n	1.2E+06	nm					2.0E+04	n				
				3.0E-04	I	3.0E-04	I	V		1			Phosphine	7803-51-2	2.3E+01	n	3.5E+02	n	3.1E-01	n	1.3E+00	n	5.7E-01	n				
				1.0E+00	P	1.0E-02	I			1			Phosphoric Acid	7664-38-2	7.8E+04	n	1.1E+06	nm	1.0E+01	n	4.4E+01	n	2.0E+04	n				
				2.0E-05	I			V		1			Phosphorus, White	7723-14-0	1.6E+00	n	2.3E+01	n					4.0E-01	n		1.5E-03	n	
													Phthalates																
1.4E-02	I	2.4E-06	C	2.0E-02	I					1	0.1		~Bis(2-ethylhexyl)phthalate	117-81-7	3.9E+01	c*	1.6E+02	c	1.2E+00	c	5.1E+00	c	5.6E+00	c*	6.0E+00	1.3E+00	c*	1.4E+00

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = OW; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; c = cancer; n = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded; V = volatile; M = mutagen.

Toxicity and Chemical-specific Information													Contaminant		Screening Levels											Protection of Groundwater SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tap Water (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
1.9E-03	P			2.0E-01	I					1	0.1		~Butyl Benzyl Phthalate	85-68-7	2.9E+02	c*	1.2E+03	c					1.6E+01	c		2.4E-01	c	
				1.0E+00	I					1	0.1		~Butylphthalyl Butylglycolate	85-70-1	6.3E+04	n	8.2E+05	nm					1.3E+04	n		3.1E+02	n	
				1.0E-01	I					1	0.1		~Dibutyl Phthalate	84-74-2	6.3E+03	n	8.2E+04	n					9.0E+02	n		2.3E+00	n	
				8.0E-01	I					1	0.1		~Diethyl Phthalate	84-66-2	5.1E+04	n	6.6E+05	nm					1.5E+04	n		6.1E+00	n	
				1.0E-01	I			V		1			~Dimethylterephthalate	120-61-6	7.8E+03	n	1.2E+05	nm					1.9E+03	n		4.9E-01	n	
				1.0E-02	P					1	0.1		~Octyl Phthalate, di-N-	117-84-0	6.3E+02	n	8.2E+03	n					2.0E+02	n		5.7E+01	n	
				5.0E-01	X					1	0.1		~Phthalic Acid, p-	100-21-0	3.2E+04	n	4.1E+05	nm					9.4E+03	n		3.4E+00	n	
				2.0E+00	I	2.0E-02	C			1	0.1		~Phthalic Anhydride	85-44-9	1.3E+05	nm	1.6E+06	nm	2.1E+01	n	8.8E+01	n	3.9E+04	n		8.5E+00	n	
				7.0E-02	I					1	0.1		Picloram	1918-02-1	4.4E+03	n	5.7E+04	n					1.4E+03	n	5.0E+02	3.8E-01	n	1.4E-01
				1.0E-04	X					1	0.1		Picramic Acid (2-Amino-4,6-dinitrophenol)	96-91-3	6.3E+00	n	8.2E+01	n					2.0E+00	n		1.3E-03	n	
				2.0E-03	X					1	0.1		Picric Acid (2,4,6-Trinitrophenol)	88-89-1	1.3E+02	n	1.6E+03	n					4.0E+01	n		1.9E-01	n	
				7.3E-04	O					1	0.1		Pirimiphos, Methyl	29232-93-7	4.6E+01	n	6.0E+02	n					8.9E+00	n		8.4E-03	n	
3.0E+01	C	8.6E-03	C	7.0E-06	H					1	0.1		Polybrominated Biphenyls	36355-01-8	1.8E-02	c*	7.7E-02	c*	3.3E-04	c	1.4E-03	c	2.6E-03	c*				
													Polychlorinated Biphenyls (PCBs)															
7.0E-02	G	2.0E-05	G	7.0E-05	I			V		1	0.14		~Aroclor 1016	12674-11-2	4.1E+00	n	2.7E+01	c**	1.4E-01	c	6.1E-01	c	2.2E-01	c**		2.1E-02	c**	
2.0E+00	G	5.7E-04	G					V		1	0.14		~Aroclor 1221	11104-28-2	2.0E-01	c	8.3E-01	c	4.9E-03	c	2.1E-02	c	4.7E-03	c		8.0E-05	c	
2.0E+00	G	5.7E-04	G					V		1	0.14		~Aroclor 1232	11141-16-5	1.7E-01	c	7.2E-01	c	4.9E-03	c	2.1E-02	c	4.7E-03	c		8.0E-05	c	
2.0E+00	G	5.7E-04	G					V		1	0.14		~Aroclor 1242	53469-21-9	2.3E-01	c	9.5E-01	c	4.9E-03	c	2.1E-02	c	7.8E-03	c		1.2E-03	c	
2.0E+00	G	5.7E-04	G					V		1	0.14		~Aroclor 1248	12672-29-6	2.3E-01	c	9.4E-01	c	4.9E-03	c	2.1E-02	c	7.8E-03	c		1.2E-03	c	
2.0E+00	G	5.7E-04	G	2.0E-05	I			V		1	0.14		~Aroclor 1254	11097-69-1	2.4E-01	c**	9.7E-01	c*	4.9E-03	c	2.1E-02	c	7.8E-03	c*		2.0E-03	c*	
2.0E+00	G	5.7E-04	G					V		1	0.14		~Aroclor 1260	11096-82-5	2.4E-01	c	9.9E-01	c	4.9E-03	c	2.1E-02	c	7.8E-03	c		5.5E-03	c	
				6.0E-04	X			V		1	0.14		~Aroclor 5460	11126-42-4	3.5E+01	n	4.4E+02	n					1.2E+01	n		2.0E+00	n	
3.9E+00	W	1.1E-03	W	2.3E-05	W	1.3E-03	W	V		1	0.14		~Heptachlorobiphenyl, 2,3,3',4,4',5,5'- (PCB 189)	39635-31-9	1.3E-01	c*	5.2E-01	c*	2.5E-03	c	1.1E-02	c	4.0E-03	c		2.8E-03	c	
3.9E+00	W	1.1E-03	W	2.3E-05	W	1.3E-03	W	V		1	0.14		~Hexachlorobiphenyl, 2,3',4,4',5,5'- (PCB 167)	52663-72-6	1.2E-01	c*	5.1E-01	c*	2.5E-03	c	1.1E-02	c	4.0E-03	c		1.7E-03	c	
3.9E+00	W	1.1E-03	W	2.3E-05	W	1.3E-03	W	V		1	0.14		~Hexachlorobiphenyl, 2,3,3',4,4',5'- (PCB 157)	69782-90-7	1.2E-01	c*	5.0E-01	c*	2.5E-03	c	1.1E-02	c	4.0E-03	c		1.7E-03	c	
3.9E+00	W	1.1E-03	W	2.3E-05	W	1.3E-03	W	V		1	0.14		~Hexachlorobiphenyl, 2,3,3',4,4',5- (PCB 156)	38380-08-4	1.2E-01	c*	5.0E-01	c*	2.5E-03	c	1.1E-02	c	4.0E-03	c		1.7E-03	c	
3.9E+03	W	1.1E+00	W	2.3E-08	W	1.3E-06	W	V		1	0.14		~Hexachlorobiphenyl, 3,3',4,4',5,5'- (PCB 169)	32774-16-6	1.2E-04	c*	5.1E-04	c*	2.5E-06	c	1.1E-05	c	4.0E-06	c		1.7E-06	c	
3.9E+00	W	1.1E-03	W	2.3E-05	W	1.3E-03	W	V		1	0.14		~Pentachlorobiphenyl, 2',3,4,4',5- (PCB 123)	65510-44-3	1.2E-01	c*	4.9E-01	c*	2.5E-03	c	1.1E-02	c	4.0E-03	c		1.0E-03	c	
3.9E+00	W	1.1E-03	W	2.3E-05	W	1.3E-03	W	V		1	0.14		~Pentachlorobiphenyl, 2,3',4,4',5- (PCB 118)	31508-00-6	1.2E-01	c*	4.9E-01	c*	2.5E-03	c	1.1E-02	c	4.0E-03	c		1.0E-03	c	
3.9E+00	W	1.1E-03	W	2.3E-05	W	1.3E-03	W	V		1	0.14		~Pentachlorobiphenyl, 2,3,3',4,4'- (PCB 105)	32598-14-4	1.2E-01	c*	4.9E-01	c*	2.5E-03	c	1.1E-02	c	4.0E-03	c		1.0E-03	c	
3.9E+00	W	1.1E-03	W	2.3E-05	W	1.3E-03	W	V		1	0.14		~Pentachlorobiphenyl, 2,3,4,4',5- (PCB 114)	74472-37-0	1.2E-01	c*	5.0E-01	c*	2.5E-03	c	1.1E-02	c	4.0E-03	c		1.0E-03	c	
1.3E+04	W	3.8E+00	W	7.0E-09	W	4.0E-07	W	V		1	0.14		~Pentachlorobiphenyl, 3,3',4,4',5- (PCB 126)	57465-28-8	3.6E-05	c*	1.5E-04	c*	7.4E-07	c	3.2E-06	c	1.2E-06	c		3.0E-07	c	
2.0E+00	I	5.7E-04	I					V		1	0.14		~Polychlorinated Biphenyls (high risk)	1336-36-3	2.3E-01	c	9.4E-01	c	4.9E-03	c	2.1E-02	c			5.0E-01			
4.0E-01	I	1.0E-04	I					V		1	0.14		~Polychlorinated Biphenyls (low risk)	1336-36-3					2.8E-02	c	1.2E-01	c	4.4E-02	c	5.0E-01	6.8E-03	c	7.8E-02
7.0E-02	I	2.0E-05	I					V		1	0.14		~Polychlorinated Biphenyls (lowest risk)	1336-36-3					1.4E-01	c	6.1E-01	c			5.0E-01			
1.3E+01	W	3.8E-03	W	7.0E-06	W	4.0E-04	W			1	0.14		~Tetrachlorobiphenyl, 3,3',4,4'- (PCB 77)	32598-13-3	3.8E-02	c*	1.6E-01	c*	7.4E-04	c	3.2E-03	c	6.0E-03	c*		9.4E-04	c*	
3.9E+01	W	1.1E-02	W	2.3E-06	W	1.3E-04	W	V		1	0.14		~Tetrachlorobiphenyl, 3,4,4',5- (PCB 81)	70362-50-4	1.2E-02	c*	4.8E-02	c*	2.5E-04	c	1.1E-03	c	4.0E-04	c		6.2E-05	c	
						6.0E-04	I			1	0.1		Polymeric Methylene Diphenyl Diisocyanate (PMDI)	9016-87-9	8.5E+05	nm	3.6E+06	nm	6.3E-01	n	2.6E+00	n						
													Polynuclear Aromatic Hydrocarbons (PAHs)															
				6.0E-02	I			V		1	0.13		~Acenaphthene	83-32-9	3.6E+03	n	4.5E+04	n					5.3E+02	n		5.5E+00	n	
				3.0E-01	I			V		1	0.13		~Anthracene	120-12-7	1.8E+04	n	2.3E+05	nm					1.8E+03	n		5.8E+01	n	
1.0E-01	E	6.0E-05	E					V	M	1	0.13		~Benz[a]anthracene	56-55-3	1.1E+00	c	2.1E+01	c	1.7E-02	c	2.0E-01	c	3.0E-02	c		1.1E-02	c	
				9.0E-05	X	2.0E-06	X			1	0.1		~Benzo(e)pyrene	192-97-2	5.7E+00	n	7.3E+01	n	2.1E-03	n	8.8E-03	n	1.8E+00	n		2.2E+00	n	
1.2E+00	C	1.1E-04	C							1	0.13		~Benzo(j)fluoranthene	205-82-3	4.2E-01	c	1.8E+00	c	2.6E-02	c	1.1E-01	c	6.5E-02	c		7.8E-02	c	
1.0E+00	I	6.0E-04	I	3.0E-04	I	2.0E-06	I		M	1	0.13		~Benzo[a]pyrene	50-32-8	1.1E-01	c	2.1E+00	c	1.7E-03	c**	8.8E-03	n	2.5E-02	c	2.0E-01	2.9E-02	c	2.4E-01
1.0E-01	E	6.0E-05	E						M	1	0.13		~Benzo[b]fluoranthene	205-99-2	1.1E+00	c	2.1E+01	c	1.7E-02	c	2.0E-01	c	2.5E-01	c		3.0E-01	c	
1.0E-02	E	6.0E-06	E						M	1	0.13		~Benzo[k]fluoranthene	207-08-9	1.1E+01	c	2.1E+02	c	1.7E-01	c	2.0E+00	c	2.5E+00	c		2.9E+00	c	
				8.0E-02	I			V		1	0.13		~Chloronaphthalene, Beta-	91-58-7	4.8E+03	n	6.0E+04	n					7.5E+02	n		3.9E+00	n	
1.0E-03	E	6.0E-07	E						M	1	0.13		~Chrysene	218-01-9	1.1E+02	c	2.1E+03	c	1.7E+00	c	2.0E+01	c	2.5E+01	c		9.0E+00	c	
1.0E+00	E	6.0E-04	E						M	1	0.13		~Dibenz[a,h]anthracene	53-70-3	1.1E-01	c	2.1E+00	c	1.7E-03	c	2.0E-02	c	2.5E-02	c		9.6E-02	c	
1.2E+01	C	1.1E-03	C							1	0.13		~Dibenzo(a,e)pyrene	192-65-4	4.2E-02	c	1.8E-01	c	2.6E-03	c	1.1E-02	c	6.5E-03	c		8.4E-02	c	
2.5E+02	C	7.1E-02	C						M	1	0.13		~Dimethylbenz(a)anthracene, 7,12-	57-97-6	4.6E-04	c	8.4E-03	c	1.4E-05	c	1.7E-04	c	1.0E-04	c		9.9E-05	c	
				4.0E-02	I					1	0.13		~Fluoranthene	206-44-0	2.4E+03	n	3.0E+04	n					8.0E+02	n		8.9E+01	n	
				4.0E-02	I			V		1	0.13		~Fluorene	86-73-7	2.4E+03	n	3.0E+04	n					2.9E+02	n		5.4E+00	n	
1.0E-01	E	6.0E-05	E						M	1	0.13		~Indeno[1,2,3-cd]pyrene	193-39-5	1.1E+00	c	2.1E+01	c	1.7E-02	c	2.0E-01	c	2.5E-01	c		9.8E-01	c	
2.9E-02	P			7.0E-02	A			V		1	0.13	3.9E+02	~Methylnaphthalene, 1-	90-12-0	1.8E+01	c	7.3E+01	c					1.1E+00	c		6.0E-03	c	
				4.0E-03	I			V		1	0.13		~Methylnaphthalene, 2-	91-57-6	2.4E+02	n	3.0E+03	n					3.6E+01	n		1.9E-01	n	
1.2E-01	C	3.4E-05	C	2.0E-02	I	3.0E-03	I	V		1	0.13		~Naphthalene	91-20-3	2.0E+00	c*	8.6E+00	c*	8.3E-02	c*	3.6E-01	c*	1.2E-01	c*		3.8E-04	c*	
1.2E+00	C	1.1E-04	C							1	0.13		~Nitropyrene, 4-	57835-92-4	4.2E-01	c	1.8E+00	c	2.6E-02	c	1.1E-01	c	1.9E-02	c		3.3E-03	c	
				9.0E-05	X	2.0E-06	X			1	0.13		~Perylene	198-55-0	5.4E+00	n	6.7E+01	n	2.1E-03	n	8.8E-03	n	1.8E+00	n		2.2E+00	n	
				3.0E-02	I			V		1	0.13		~Pyrene	129-00-0	1.8E+03	n	2.3E+04	n					1.2E+02	n		1.3E+01	n	
1.5E-01	I			9.0E-03	I					1	0.1		Prochloraz	67747-09-5	3.6E+00	c	1.5E+01	c					3.8E-01	c		1.9E-03	c	
				6.0E-03	H			V		1			Profluralin	26399-36-0	4.7E+02	n	7.0E+03	n					2.6E+01	n		1.6E+00	n	
				1.5E-02	I					1	0.1		Prometon	1610-18-0	9.5E+02	n	1.2E+04	n					2.5E+02	n		1.2E-01	n	
				4.0E-02	O					1	0.1		Prometryn	7287-19-6	2.5E+03	n	3.3E+04	n					6.0E+02	n		9.0E-01	n	
				7.5E-02	I					1	0.1		Pronamide	23950-58-5	4.7E+03	n	6.2E+04	n					1.2E+03	n		1.2E+00	n	
				1.3E-02	I					1	0.1		Propachlor	1918-16-7	8.2E+02	n	1.1E+04	n					2.5E+02	n		1.5E-01	n	
				5.0E-03	I					1	0.1		Propanil	709-98-8	3.2E+02	n	4.1E+03	n					8.2E+01	n		4.5E-02	n	
1.9E-01	O			4.0E-02	O					1	0.1		Propargite	2312-35-8	2.8E+00	c	1.2E+01	c					1.6E-01	c		1.1E-02	c	
				2.0E-03	I			V		1		1.1E+05	Propargyl Alcohol	107-19-7	1.6E+02	n	2.3E+03	n					4.0E+01	n		8.1E-03	n	
				2.0E-02	I					1	0.1		Propazine	139-40-2	1.3E+03	n	1.6E+04	n					3.4E+02	n		3.0E-01	n	
				2.0E-02	I					1	0.1		Propham	122-42-9	1.3E+03	n	1.6E+04	n					3.5E+02	n		2.2E-01	n	
				1.0E-01	O					1	0.1		Propiconazole	60207-90-1	6.3E+03	n	8.2E+04	n					1.6E+03	n		5.3E+00	n	
						8.0E-03	I	V		1		3.3E+04	Propionaldehyde	123-38-6	7.5E+01	n	3.1E+02	n	8.3E+00	n	3.5E+01	n	1.7E+01	n		3.4E-03	n	
				1.0E-01	X	1.0E+00	X	V		1		2.6E+02	Propyl benzene	103-65-1	3.8E+03	ns	2.4E+04	ns	1.0E+03	n	4.4E+03	n	6.6E+02	n		1.2E+00	n	
						3.0E+00	C	V		1		3.5E+02	Propylene	115-07-1	2.2E+03	ns	9.3E+03	ns	3.1E+03	n	1.3E+04	n	6.3E+03	n		6.0E+00	n	
				2.0E+01	P					1	0.1		Propylene Glycol	57-55-6	1.3E+06	nm	1.6E+07	nm					4.0E+05	n		8.1E+01	n	
						2.7E-04	A			1	0.1		Propylene Glycol Dinitrate	6423-43-4	3.9E+05	nm	1.6E+06	nm	2.8E-01	n	1.2E+00	n						

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = OW; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; c = cancer; n = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded; V = volatile; M = mutagen.

Toxicity and Chemical-specific Information													Contaminant		Screening Levels											Protection of Groundwater SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tap Water (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
				7.0E-01	H	2.0E+00	I	V		1		1.1E+05	Propylene Glycol Monomethyl Ether	107-98-2	4.1E+04	n	3.7E+05	nms	2.1E+03	n	8.8E+03	n	3.2E+03	n		6.5E-01	n	
2.4E-01	I	3.7E-06	I			3.0E-02	I	V		1		7.8E+04	Propylene Oxide	75-56-9	2.1E+00	c	9.7E+00	c	7.6E-01	c*	3.3E+00	c*	2.7E-01	c		5.6E-05	c	
				1.0E-03	I			V		1		5.3E+05	Pyridine	110-86-1	7.8E+01	n	1.2E+03	n					2.0E+01	n		6.8E-03	n	
				5.0E-04	I					1	0.1		Quinalphos	13593-03-8	3.2E+01	n	4.1E+02	n					5.1E+00	n		4.3E-02	n	
3.0E+00	I									1	0.1		Quinoline	91-22-5	1.8E-01	c	7.7E-01	c					2.4E-02	c		7.8E-05	c	
				9.0E-03	I					1	0.1		Quizalofop-ethyl	76578-14-8	5.7E+02	n	7.4E+03	n					1.2E+02	n		1.9E+00	n	
						3.0E+04	A			1			Refractory Ceramic Fibers (units in fibers)	E715557					3.1E+04	G	1.3E+05	G						
				3.0E-02	I					1	0.1		Resmethrin	10453-86-8	1.9E+03	n	2.5E+04	n					6.7E+01	n		4.2E+01	n	
				5.0E-02	H			V		1			Ronnel	299-84-3	3.9E+03	n	5.8E+04	n					4.1E+02	n		3.7E+00	n	
				4.0E-03	I					1	0.1		Rotenone	83-79-4	2.5E+02	n	3.3E+03	n					6.1E+01	n		3.2E+01	n	
2.2E-01	C	6.3E-05	C						M	1	0.1		Safrole	94-59-7	5.5E-01	c	1.0E+01	c	1.6E-02	c	1.9E-01	c	9.6E-02	c		5.9E-05	c	
				5.0E-03	I					1			Selenious Acid	7783-00-8	3.9E+02	n	5.8E+03	n					1.0E+02	n				
				5.0E-03	I	2.0E-02	C			1			Selenium	7782-49-2	3.9E+02	n	5.8E+03	n	2.1E+01	n	8.8E+01	n	1.0E+02	n	5.0E+01	5.2E-01	n	2.6E-01
				5.0E-03	C	2.0E-02	C			1			Selenium Sulfide	7446-34-6	3.9E+02	n	5.8E+03	n	2.1E+01	n	8.8E+01	n	1.0E+02	n				
				1.4E-01	O					1	0.1		Sethoxydim	74051-80-2	8.8E+03	n	1.1E+05	nm					1.6E+03	n		1.4E+01	n	
						3.0E-03	C			1			Silica (crystalline, respirable)	7631-86-9	4.3E+06	nm	1.8E+07	nm	3.1E+00	n	1.3E+01	n						
				5.0E-03	I					0.04			Silver	7440-22-4	3.9E+02	n	5.8E+03	n					9.4E+01	n		8.0E-01	n	
1.2E-01	H			5.0E-03	I					1	0.1		Simazine	122-34-9	4.5E+00	c*	1.9E+01	c					6.1E-01	c	4.0E+00	3.0E-04	c	2.0E-03
				1.3E-02	I					1	0.1		Sodium Acifluorfen	62476-59-9	8.2E+02	n	1.1E+04	n					2.6E+02	n		2.1E+00	n	
				4.0E-03	I					1			Sodium Azide	26628-22-8	3.1E+02	n	4.7E+03	n					8.0E+01	n				
2.7E-01	H			3.0E-02	I					1	0.1		Sodium Diethyldithiocarbamate	148-18-5	2.0E+00	c	8.5E+00	c					2.9E-01	c		1.8E-04	c	
				5.0E-02	A	1.4E-02	C			1			Sodium Fluoride	7681-49-4	3.9E+03	n	5.8E+04	n	1.5E+01	n	6.1E+01	n	1.0E+03	n	4.0E+03	1.5E+02	n	6.0E+02
				2.0E-05	I					1	0.1		Sodium Fluoroacetate	62-74-8	1.3E+00	n	1.6E+01	n					4.0E-01	n		8.1E-05	n	
				1.0E-03	H					1			Sodium Metavanadate	13718-26-8	7.8E+01	n	1.2E+03	n					2.0E+01	n				
				8.0E-04	P					1			Sodium Tungstate	13472-45-2	6.3E+01	n	9.3E+02	n					1.6E+01	n				
				8.0E-04	P					1			Sodium Tungstate Dihydrate	10213-10-2	6.3E+01	n	9.3E+02	n					1.6E+01	n				
2.4E-02	H			3.0E-02	I					1	0.1		Stirofos (Tetrachlorovinphos)	961-11-5	2.3E+01	c*	9.6E+01	c					2.8E+00	c		8.2E-03	c	
				6.0E-01	I					1			Strontium, Stable	7440-24-6	4.7E+04	n	7.0E+05	nm					1.2E+04	n		4.2E+02	n	
				3.0E-04	I					1	0.1		Strychnine	57-24-9	1.9E+01	n	2.5E+02	n					5.9E+00	n		6.5E-02	n	
				2.0E-01	I	1.0E+00	I	V		1		8.7E+02	Styrene	100-42-5	6.0E+03	ns	3.5E+04	ns	1.0E+03	n	4.4E+03	n	1.2E+03	n	1.0E+02	1.3E+00	n	1.1E-01
				3.0E-03	P					1	0.1		Styrene-Acrylonitrile (SAN) Trimer (THNA isomer)	57964-39-3	1.9E+02	n	2.5E+03	n					4.8E+01	n				
				3.0E-03	P					1	0.1		Styrene-Acrylonitrile (SAN) Trimer (THNP isomer)	57964-40-6	1.9E+02	n	2.5E+03	n					4.8E+01	n				
				1.0E-03	P	2.0E-03	X			1	0.1		Sulfolane	126-33-0	6.3E+01	n	8.2E+02	n	2.1E+00	n	8.8E+00	n	2.0E+01	n		4.4E-03	n	
				8.0E-04	P					1	0.1		Sulfonylbis(4-chlorobenzene), 1,1'-	80-07-9	5.1E+01	n	6.6E+02	n					1.1E+01	n		6.5E-02	n	
						1.0E-03	C	V		1			Sulfur Trioxide	7446-11-9	1.4E+06	nm	6.0E+06	nm	1.0E+00	n	4.4E+00	n	2.1E+00	n				
						1.0E-03	C			1			Sulfuric Acid	7664-93-9	1.4E+06	nm	6.0E+06	nm	1.0E+00	n	4.4E+00	n						
2.5E-02	I	7.1E-06	I	5.0E-02	H					1	0.1		Sulfurous acid, 2-chloroethyl 2-[4-(1,1-dimethylethyl)phenoxy]-1-methylethyl	140-57-8	2.2E+01	c	9.2E+01	c	4.0E-01	c	1.7E+00	c	1.3E+00	c		1.5E-02	c	
				3.0E-02	H					1	0.1		TCMTB	21564-17-0	1.9E+03	n	2.5E+04	n					4.8E+02	n		3.3E+00	n	
				7.0E-02	I					1	0.1		Tebuthiuron	34014-18-1	4.4E+03	n	5.7E+04	n					1.4E+03	n		3.9E-01	n	
				2.0E-02	H					1	0.1		Temephos	3383-96-8	1.3E+03	n	1.6E+04	n					4.0E+02	n		7.6E+01	n	
				1.3E-02	I					1	0.1		Terbacil	5902-51-2	8.2E+02	n	1.1E+04	n					2.5E+02	n		7.5E-02	n	
				2.5E-05	H			V		1		3.1E+01	Terbufos	13071-79-9	2.0E+00	n	2.9E+01	n					2.4E-01	n		5.2E-04	n	
				1.0E-03	I					1	0.1		Terbutryn	886-50-0	6.3E+01	n	8.2E+02	n					1.3E+01	n		1.9E-02	n	
5.0E-03	C	1.3E-06	C					V		1			Tert-Butyl Acetate	540-88-5	8.1E+00	c	3.6E+01	c	2.2E+00	c	9.4E+00	c	3.3E+00	c		7.6E-04	c	
				1.0E-04	I					1	0.1		Tetrabromodiphenyl ether, 2,2',4,4'- (BDE-47)	5436-43-1	6.3E+00	n	8.2E+01	n					2.0E+00	n		5.3E-02	n	
				3.0E-05	P			V		1			Tetrachlorobenzene, 1,2,4,5-	95-94-3	2.3E+00	n	3.5E+01	n					1.7E-01	n		7.9E-04	n	
2.6E-02	I	7.4E-06	I	3.0E-02	I			V		1		6.8E+02	Tetrachloroethane, 1,1,1,2-	630-20-6	2.0E+00	c	8.8E+00	c	3.8E-01	c	1.7E+00	c	5.7E-01	c		2.2E-04	c	
2.0E-01	I	5.8E-05	C	2.0E-02	I			V		1		1.9E+03	Tetrachloroethane, 1,1,2,2-	79-34-5	6.0E-01	c	2.7E+00	c	4.8E-02	c	2.1E-01	c	7.6E-02	c		3.0E-05	c	
2.1E-03	I	2.6E-07	I	6.0E-03	I	4.0E-02	I	V		1		1.7E+02	Tetrachloroethylene	127-18-4	2.4E+01	c**	1.0E+02	c**	1.1E+01	c**	4.7E+01	c**	1.1E+01	c**	5.0E+00	5.1E-03	c**	2.3E-03
				3.0E-02	I					1	0.1		Tetrachlorophenol, 2,3,4,6-	58-90-2	1.9E+03	n	2.5E+04	n					2.4E+02	n		1.8E-01	n	
1.6E+01	X			6.0E-05	X			V		1			Tetrachlorotoluene, p- alpha, alpha, alpha-	5216-25-1	4.3E-02	c	2.0E-01	c					1.7E-03	c		5.7E-06	c	
				5.0E-04	I					1	0.1		Tetraethyl Dithiopyrophosphate	3689-24-5	3.2E+01	n	4.1E+02	n					7.1E+00	n		5.2E-03	n	
						8.0E+01	I	V		1		2.1E+03	Tetrafluoroethane, 1,1,1,2-	811-97-2	1.0E+05	nms	4.3E+05	nms	8.3E+04	n	3.5E+05	n	1.7E+05	n		9.3E+01	n	
				1.0E-04	X					1	0.1		Tetramethylphosphoramide, -N,N,N',N" (TMPA)	16853-36-4	6.3E+00	n	8.2E+01	n					2.0E+00	n				
				2.0E-03	P					1	0.00065		Tetryl (Trinitrophenylmethylnitramine)	479-45-8	1.6E+02	n	2.3E+03	n					3.9E+01	n		3.7E-01	n	
				2.0E-05	G					1			Thallic Oxide	1314-32-5	1.6E+00	n	2.3E+01	n					4.0E-01	n				
				1.0E-05	X					1			Thallium (I) Nitrate	10102-45-1	7.8E-01	n	1.2E+01	n					2.0E-01	n				
				1.0E-05	X					1			Thallium (Soluble Salts)	7440-28-0	7.8E-01	n	1.2E+01	n					2.0E-01	n	2.0E+00	1.4E-02	n	1.4E-01
				1.0E-05	X			V		1			Thallium Acetate	563-68-8	7.8E-01	n	1.2E+01	n					2.0E-01	n		4.1E-05	n	
				2.0E-05	X					1	0.1		Thallium Carbonate	6533-73-9	1.3E+00	n	1.6E+01	n					4.0E-01	n		8.3E-05	n	
				1.0E-05	X					1			Thallium Chloride	7791-12-0	7.8E-01	n	1.2E+01	n					2.0E-01	n				
				1.0E-05	G					1			Thallium Selenite	12039-52-0	7.8E-01	n	1.2E+01	n					2.0E-01	n				
				2.0E-05	X					1			Thallium Sulfate	7446-18-6	1.6E+00	n	2.3E+01	n					4.0E-01	n				
				4.3E-02	O					1	0.1		Thifensulfuron-methyl	79277-27-3	2.7E+03	n	3.5E+04	n					8.6E+02	n		2.6E-01	n	
				1.0E-02	I					1	0.1		Thiobencarb	28249-77-6	6.3E+02	n	8.2E+03	n					1.6E+02	n		5.5E-01	n	
				7.0E-02	X					1	0.0075		Thiodiglycol	111-48-8	5.4E+03	n	7.9E+04	n					1.4E+03	n		2.8E-01	n	
				3.0E-04	H					1	0.1		Thiofanox	39196-18-4	1.9E+01	n	2.5E+02	n					5.3E+00	n		1.8E-03	n	
1.2E-02	O			1.6E-01	O					1	0.1		Thiophanate, Methyl	23564-05-8	4.7E+01	c	2.0E+02	c					6.7E+00	c		5.7E-03	c	
				1.5E-02	O					1	0.1		Thiram	137-26-8	9.5E+02	n	1.2E+04	n					2.9E+02	n		4.2E-01	n	
				6.0E-01	H					1			Tin	7440-31-5	4.7E+04	n	7.0E+05	nm					1.2E+04	n		3.0E+03	n	
						1.0E-04	A	V		1			Titanium Tetrachloride	7550-45-0	1.4E+05	nm	6.0E+05	nm	1.0E-01	n	4.4E-01	n	2.1E-01	n				
				8.0E-02	I	5.0E+00	I	V		1		8.2E+02	Toluene	108-88-3	4.9E+03	ns	4.7E+04	ns	5.2E+03	n	2.2E+04	n	1.1E+03	n	1.0E+03	7.6E-01	n	6.9E-01
3.9E-02	C	1.1E-05	C			8.0E-06	C	V		1			Toluene-2,4-diisocyanate	584-84-9	6.4E+00	n	2.7E+01	n	8.3E-03	n	3.5E-02	n	1.7E-02	n		2.5E-04	n	
1.8E-01	X			2.0E-04	X					1	0.1		Toluene-2,5-diamine	95-70-5	3.0E+00	c**	1.3E+01	c*					4.3E-01	c**		1.3E-04	c**	
3.9E-02	C	1.1E-05	C			8.0E-06	C	V		1		1.7E+03	Toluene-2,6-diisocyanate	91-08-7	5.3E+00	n	2.2E+01	n	8.3E-03	n	3.5E-02	n	1.7E-02	n		2.6E-04	n	
				1.0E-04	X					1	0.1		Toluenediamine, 2,3-	2687-25-4	6.3E+00	n	8.2E+01	n					2.0E+00	n		6.2E-04	n	
				1.0E-04	X					1	0.1		Toluenediamine, 3,4-	496-72-0	6.3E+00	n	8.2E+01	n					2.0E+00	n		6.2E-04	n	
				5.0E-03	P					1	0.1		Toluic Acid, p-	99-94-5	3.2E+02	n	4.1E+03	n					9.0E+01	n		2.3E-02	n	

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = OW; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; c = cancer; n = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded; V = volatile; M = mutagen.

Toxicity and Chemical-specific Information													Contaminant		Screening Levels												Protection of Groundwater SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tap Water (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
1.6E-02	P	5.1E-05	C							1	0.1		Toluidine, o- (Methylaniline, 2-)	95-53-4	3.4E+01	c	1.4E+02	c	5.5E-02	c	2.4E-01	c	4.7E+00	c		2.0E-03	c	
3.0E-02	P			4.0E-03	X					1	0.1		Toluidine, p-	106-49-0	1.8E+01	c*	7.7E+01	c*					2.5E+00	c*		1.1E-03	c*	
				3.0E+00	P			V		1		3.4E-01	Total Petroleum Hydrocarbons (Aliphatic High)	E1790670	2.3E+05	nms	3.5E+06	nms					6.0E+04	n		2.4E+03	n	
				5.0E-03	P	4.0E-01	P	V		1		1.1E+02	Total Petroleum Hydrocarbons (Aliphatic Low)	E1790666	2.5E+02	ns	1.9E+03	ns	4.2E+02	n	1.8E+03	n	2.8E+01	n		2.0E-02	n	
				1.0E-02	X	1.0E-01	P	V		1		6.9E+00	Total Petroleum Hydrocarbons (Aliphatic Medium)	E1790668	9.6E+01	ns	4.4E+02	ns	1.0E+02	n	4.4E+02	n	1.0E+02	n		1.5E+00	n	
				3.0E-04	P	2.0E-06	P		M	1	0.13		Total Petroleum Hydrocarbons (Aromatic High)	E1790676	1.8E+01	n	2.2E+02	n	2.1E-03	n	8.8E-03	n	6.0E+00	n		7.1E+00	n	
				1.0E-02	P	6.0E-02	P	V		1		2.3E+02	Total Petroleum Hydrocarbons (Aromatic Medium)	E1790674	3.0E+02	ns	1.7E+03	ns	6.3E+01	n	2.6E+02	n	5.7E+01	n		8.3E-02	n	
1.1E+00	I	3.2E-04	I	9.0E-05	P					1	0.1		Toxaphene	8001-35-2	4.9E-01	c*	2.1E+00	c*	8.8E-03	c	3.8E-02	c	7.1E-02	c*	3.0E+00	1.1E-02	c*	4.6E-01
				3.0E-05	X					1	0.1		Toxaphene, Weathered	E1841606	1.9E+00	n	2.5E+01	n					6.0E-01	n		9.3E-02	n	
				7.5E-03	I					1	0.1		Tralomethrin	66841-25-6	4.7E+02	n	6.2E+03	n					1.5E+02	n		5.8E+01	n	
				3.0E-04	A			V		1			Tri-n-butyltin	688-73-3	2.3E+01	n	3.5E+02	n					3.7E+00	n		8.2E-02	n	
				8.0E+01	X					1	0.1		Triacetin	102-76-1	5.1E+06	nm	6.6E+07	nm					1.6E+06	n		4.5E+02	n	
				3.4E-02	O					1	0.1		Triadimefon	43121-43-3	2.1E+03	n	2.8E+04	n					6.3E+02	n		5.0E-01	n	
7.2E-02	O			2.5E-02	O			V		1			Triallate	2303-17-5	9.7E+00	c	4.6E+01	c					4.7E-01	c		1.0E-03	c	
				1.0E-02	I					1	0.1		Triasulfuron	82097-50-5	6.3E+02	n	8.2E+03	n					2.0E+02	n		2.1E-01	n	
				8.0E-03	I					1	0.1		Tribenuron-methyl	101200-48-0	5.1E+02	n	6.6E+03	n					1.6E+02	n		6.1E-02	n	
				5.0E-03	I			V		1			Tribromobenzene, 1,2,4-	615-54-3	3.9E+02	n	5.8E+03	n					4.5E+01	n		6.4E-02	n	
				9.0E-03	X					1	0.1		Tribromophenol, 2,4,6-	118-79-6	5.7E+02	n	7.4E+03	n					1.2E+02	n		2.2E-01	n	
				2.0E-04	O					1	0.1		Tribufos	78-48-8	1.3E+01	n	1.6E+02	n					5.7E-01	n		2.8E-03	n	
9.0E-03	P			1.0E-02	P					1	0.1		Tributyl Phosphate	126-73-8	6.0E+01	c*	2.6E+02	c*					5.2E+00	c*		2.5E-02	c*	
				3.0E-04	P					1	0.1		Tributyltin Compounds	E1790679	1.9E+01	n	2.5E+02	n					6.0E+00	n				
				3.0E-04	I					1	0.1		Tributyltin Oxide	56-35-9	1.9E+01	n	2.5E+02	n					5.7E+00	n		2.9E+02	n	
										1	0.1		Trichloramine	10025-85-1											4.0E+03(G)			
				3.0E+01	I	5.0E+00	P	V		1		9.1E+02	Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	6.7E+03	ns	2.8E+04	ns	5.2E+03	n	2.2E+04	n	1.0E+04	n		2.6E+01	n	
7.0E-02	I			2.0E-02	I					1	0.1		Trichloroacetic Acid	76-03-9	7.8E+00	c	3.3E+01	c					1.1E+00	c	6.0E+01(G)	2.2E-04	c	1.2E-02
2.9E-02	H									1	0.1		Trichloroaniline HCl, 2,4,6-	33663-50-2	1.9E+01	c	7.9E+01	c					2.7E+00	c		7.4E-03	c	
7.0E-03	X			3.0E-05	X					1	0.1		Trichloroaniline, 2,4,6-	634-93-5	1.9E+00	n	2.5E+01	n					4.0E-01	n		3.6E-03	n	
				8.0E-04	X			V		1			Trichlorobenzene, 1,2,3-	87-61-6	6.3E+01	n	9.3E+02	n					7.0E+00	n		2.1E-02	n	
2.9E-02	P			1.0E-02	I	2.0E-03	P	V		1		4.0E+02	Trichlorobenzene, 1,2,4-	120-82-1	2.4E+01	c**	1.1E+02	c**	2.1E+00	n	8.8E+00	n	1.2E+00	c**	7.0E+01	3.4E-03	c**	2.0E-01
				2.0E+00	I	5.0E+00	I	V		1		6.4E+02	Trichloroethane, 1,1,1-	71-55-6	8.1E+03	ns	3.6E+04	ns	5.2E+03	n	2.2E+04	n	8.0E+03	n	2.0E+02	2.8E+00	n	7.0E-02
5.7E-02	I	1.6E-05	I	4.0E-03	I	2.0E-04	X	V		1		2.2E+03	Trichloroethane, 1,1,2-	79-00-5	1.1E+00	c**	5.0E+00	c**	1.8E-01	c**	7.7E-01	c**	2.8E-01	c**	5.0E+00	8.9E-05	c**	1.6E-03
4.6E-02	I	4.1E-06	I	5.0E-04	I	2.0E-03	I	V	M	1		6.9E+02	Trichloroethylene	79-01-6	9.4E-01	c**	6.0E+00	c**	4.8E-01	c**	3.0E+00	c**	4.9E-01	c**	5.0E+00	1.8E-04	c**	1.8E-03
				3.0E-01	I			V		1		1.2E+03	Trichlorofluoromethane	75-69-4	2.3E+04	ns	3.5E+05	nms					5.2E+03	n		3.3E+00	n	
				1.0E-01	I					1	0.1		Trichlorophenol, 2,4,5-	95-95-4	6.3E+03	n	8.2E+04	n					1.2E+03	n		4.0E+00	n	
1.1E-02	I	3.1E-06	I	1.0E-03	P					1	0.1		Trichlorophenol, 2,4,6-	88-06-2	4.9E+01	c**	2.1E+02	c**	9.1E-01	c	4.0E+00	c	4.1E+00	c**		4.0E-03	c**	
				1.0E-02	I					1	0.1		Trichlorophenoxyacetic Acid, 2,4,5-	93-76-5	6.3E+02	n	8.2E+03	n					1.6E+02	n		6.8E-02	n	
				8.0E-03	I					1	0.1		Trichlorophenoxypropionic acid, -2,4,5	93-72-1	5.1E+02	n	6.6E+03	n					1.1E+02	n	5.0E+01	6.1E-02	n	2.8E-02
				5.0E-03	I			V		1		1.3E+03	Trichloropropane, 1,1,2-	598-77-6	3.9E+02	n	5.8E+03	ns					8.8E+01	n		3.5E-02	n	
3.0E+01	I			4.0E-03	I	3.0E-04	I	V	M	1		1.4E+03	Trichloropropane, 1,2,3-	96-18-4	5.1E-03	c	1.1E-01	c	3.1E-01	n	1.3E+00	n	7.5E-04	c		3.2E-07	c	
				3.0E-03	X	3.0E-04	P	V		1		3.1E+02	Trichloropropene, 1,2,3-	96-19-5	7.3E-01	n	3.1E+00	n	3.1E-01	n	1.3E+00	n	6.2E-01	n		3.1E-04	n	
				2.0E-02	A					1	0.1		Tricresyl Phosphate (TCP)	1330-78-5	1.3E+03	n	1.6E+04	n					1.6E+02	n		1.5E+01	n	
				3.0E-03	I					1	0.1		Tridiphane	58138-08-2	1.9E+02	n	2.5E+03	n					1.8E+01	n		1.3E-01	n	
						7.0E-03	I	V		1		2.8E+04	Triethylamine	121-44-8	1.2E+02	n	4.8E+02	n	7.3E+00	n	3.1E+01	n	1.5E+01	n		4.4E-03	n	
				2.0E+00	P					1	0.1		Triethylene Glycol	112-27-6	1.3E+05	nm	1.6E+06	nm					4.0E+04	n		8.8E+00	n	
						2.0E+01	P	V		1		4.8E+03	Trifluoroethane, 1,1,1-	420-46-2	1.5E+04	ns	6.2E+04	ns	2.1E+04	n	8.8E+04	n	4.2E+04	n		1.3E+02	n	
7.7E-03	I			7.5E-03	I			V		1			Trifluralin	1582-09-8	9.0E+01	c**	4.2E+02	c*					2.6E+00	c*		8.4E-02	c*	
2.0E-02	P			1.0E-02	P					1	0.1		Trimethyl Phosphate	512-56-1	2.7E+01	c*	1.1E+02	c*					3.9E+00	c*		8.6E-04	c*	
				1.0E-02	I	6.0E-02	I	V		1		2.9E+02	Trimethylbenzene, 1,2,3-	526-73-8	3.4E+02	ns	2.0E+03	ns	6.3E+01	n	2.6E+02	n	5.5E+01	n		8.1E-02	n	
				1.0E-02	I	6.0E-02	I	V		1		2.2E+02	Trimethylbenzene, 1,2,4-	95-63-6	3.0E+02	ns	1.8E+03	ns	6.3E+01	n	2.6E+02	n	5.6E+01	n		8.1E-02	n	
				1.0E-02	I	6.0E-02	I	V		1		1.8E+02	Trimethylbenzene, 1,3,5-	108-67-8	2.7E+02	ns	1.5E+03	ns	6.3E+01	n	2.6E+02	n	6.0E+01	n		8.7E-02	n	
				1.0E-02	X			V		1		3.0E+01	Trimethylpentene, 2,4,4-	25167-70-8	7.8E+02	ns	1.2E+04	ns					3.8E+01	n		1.3E-01	n	
				3.0E-02	I					1	0.019		Trinitrobenzene, 1,3,5-	99-35-4	2.2E+03	n	3.2E+04	n					5.9E+02	n		2.1E+00	n	
3.0E-02	I			5.0E-04	I					1	0.032		Trinitrotoluene, 2,4,6-	118-96-7	2.1E+01	c**	9.6E+01	c**					2.5E+00	c**		1.5E-02	c**	
				2.0E-02	P					1	0.1		Triphenylphosphine Oxide	791-28-6	1.3E+03	n	1.6E+04	n					3.6E+02	n		1.5E+00	n	
				2.0E-02	A					1	0.1		Tris(1,3-Dichloro-2-propyl) Phosphate	13674-87-8	1.3E+03	n	1.6E+04	n					3.6E+02	n		8.0E+00	n	
				1.0E-02	X					1	0.1		Tris(1-chloro-2-propyl)phosphate	13674-84-5	6.3E+02	n	8.2E+03	n					1.9E+02	n		6.5E-01	n	
2.3E+00	C	6.6E-04	C					V		1		4.7E+02	Tris(2,3-dibromopropyl)phosphate	126-72-7	2.8E-01	c	1.3E+00	c	4.3E-03	c	1.9E-02	c	6.8E-03	c		1.3E-04	c	
2.0E-02	P			7.0E-03	P					1	0.1		Tris(2-chloroethyl)phosphate	115-96-8	2.7E+01	c*	1.1E+02	c*					3.8E+00	c*		3.8E-03	c*	
3.2E-03	P			1.0E-01	P					1	0.1		Tris(2-ethylhexyl)phosphate	78-42-2	1.7E+02	c*	7.2E+02	c					2.4E+01	c*		1.2E+02	c*	
				8.0E-04	P					1			Tungsten	7440-33-7	6.3E+01	n	9.3E+02	n					1.6E+01	n		2.4E+00	n	
				2.0E-04	A	4.0E-05	A			1			Uranium	7440-61-1	1.6E+01	n	2.3E+02	n	4.2E-02	n	1.8E-01	n	4.0E+00	n	3.0E+01	1.8E+00	n	1.4E+01
1.0E+00	C	2.9E-04	C						M	1	0.1		Urethane	51-79-6	1.2E-01	c	2.3E+00	c	3.5E-03	c	4.2E-02	c	2.5E-02	c		5.6E-06	c	
		8.3E-03	P	9.0E-03	I	7.0E-06	P			0.026			Vanadium Pentoxide	1314-62-1	4.6E+02	c**	2.0E+03	c**	3.4E-04	c*	1.5E-03	c*	1.5E+02	n				
				5.0E-03	G	1.0E-04	A			0.026			Vanadium and Compounds	7440-62-2	3.9E+02	n	5.8E+03	n	1.0E-01	n	4.4E-01	n	8.6E+01	n		8.6E+01	n	
				1.0E-03	I			V		1			Vernolate	1929-77-7	7.8E+01	n	1.2E+03	n					1.1E+01	n		8.9E-03	n	
				1.2E-03	O					1	0.1		Vinclozolin	50471-44-8	7.6E+01	n	9.8E+02	n					2.1E+01	n		1.6E-02	n	
				1.0E+00	H	2.0E-01	I	V		1		2.8E+03	Vinyl Acetate	108-05-4	9.1E+02	n	3.8E+03	ns	2.1E+02	n	8.8E+02	n	4.1E+02	n		8.7E-02	n	
		1.5E-05	P			3.0E-03	I	V		1		2.5E+03	Vinyl Bromide	593-60-2	2.6E-01	c*	1.1E+00	c*	1.9E-01	c*	8.2E-01	c*	3.7E-01	c*		1.1E-04	c*	
7.2E-01	I	4.4E-06	I	3.0E-03	I	1.0E-01	I	V	M	1		3.9E+03	Vinyl Chloride	75-01-4	5.9E-02	c	1.7E+00	c	1.7E-01	c	2.8E+00	c	1.9E-02	c	2.0E+00	6.5E-06	c	6.9E-04
				3.0E-04	I					1	0.1		Warfarin	81-81-2	1.9E+01	n	2.5E+02	n					5.6E+00	n		5.9E-03	n	
				2.0E-01	G	1.0E-01	G	V		1		3.9E+02	Xylene, m-	108-38-3	5.5E+02	ns	2.4E+03	ns	1.0E+02	n	4.4E+02	n	1.9E+02	n		1.9E-01	n	
				2.0E-01	G	1.0E-01	G	V		1		4.3E+02	Xylene, o-	95-47-6	6.4E+02	ns	2.8E+03	ns	1.0E+02	n	4.4E+02	n	1.9E+02	n		1.9E-01	n	
				2.0E-01	G	1.0E-01	G	V		1		3.9E+02	Xylene, p-	106-42-3	5.6E+02	ns	2.4E+03	ns	1.0E+02	n	4.4E+02	n	1.9E+02	n		1.9E-01	n	
				2.0E-01	I	1.0E-01	I	V		1		2.6E+02	Xylenes	1330-20-7	5.8E+02	ns	2.5E+03	ns	1.0E+02	n	4.4E+02	n	1.9E+02	n	1.0E+04	1.9E-01	n	9.9E+00
				3.0E-04	I					1			Zinc Phosphide	1314-84-7	2.3E+01	n	3.5E+02	n					6.0E+00	n				
				3.0E-01	I					1			Zinc and Compounds	7440-66-6	2.3E+04	n	3.5E+05	nm					6.0E+03	n		3.7E+02	n	
				5.0E-02	I					1	0.1		Zineb	12122-67-7	3.2E+03	n	4.1E+04	n					9.9E+02	n		2.9E+00	n	
				8.0E-05	X					1			Zirconium	7440-67-7	6.3E+00	n	9.3E+01	n					1.6E+00	n		4.8E+00	n	

Commonwealth of Virginia

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

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Travis A. Voyles
Secretary of Natural and Historic Resources

Michael S. Rolband, PE, PWD, PWS Emeritus
Director
(804) 698-4020

April 19, 2023

Mr. Len DiIoia
Radford Army Ammunition Plant
Route 114, P.O. Box 1
Radford, Virginia 24143-0100

VIA ELECTRONIC MAIL

Re: Annual Groundwater Monitoring Report for Hazardous Waste Management Units 5 & 16 Radford Army Ammunitions Plant Route 114, Radford, Virginia 24141 EPA ID#: VA1210020730

Dear Mr. DiIoia:

This letter acknowledges the receipt and review of the 2022 Annual Groundwater Monitoring Report (Report) for Hazardous Waste Management Units (HWMU) 5 & 16 dated December 2022, submitted to the Virginia Department of Environmental Quality (Department or DEQ), Office of Remediation Programs (ORP) by BAE Systems on behalf of the Radford Army Ammunitions Plant (RFAAP).

The Department has no comment and accepts the Report as complete. Further, the Department concurs that the laboratory survey for a lower detection limit for 2-propanol has been reasonably competed by RFAAP and that further inquiry into this issue is no longer required. RFAAP may continue to use the permit specified detection limit of 50 micrograms per liter (ug/L) for 2-propanol for future monitoring events.

If you have any questions regarding this correspondence, you may contact me at 703-232-4200 or by email at Kurt.Kochan@deq.virginia.gov.

Sincerely,

Kurt W. Kochan
Office of Remediation Programs

cc: RFAAP Correspondence File
Tara Mason, Ashby Scott, DEQ-CO
Melissa Lincoln, BAE
Mike Lawless, DAA

BAE SYSTEMS

ORDNANCE SYSTEMS INC.
Radford Army Ammunition Plant
4050 Pepper's Ferry Road
Radford Virginia 24141

June 26, 2023

Mr. Kurt Kochan
Office of Remediation Programs
Virginia Department of Environmental Quality
1111 East Main Street, Suite 1400
Richmond, Virginia 23219

Subject: Semiannual and Annual Corrective Action Groundwater Monitoring Event Notification – HWMU-5
Semiannual Detection Notification – HWMU-16
Post Closure Care Permit HWMUs 5 & 16
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

Dear Mr. Kochan:

The following information pertains to routine detection notification for the recent semiannual groundwater monitoring event for Hazardous Waste Management Units (HWMUs) 5 and 16.

Groundwater Monitoring Event Notification - HWMU-5 and HWMU-16

During Second Quarter 2023, BAE Systems, Ordnance Systems Inc. (BAE) completed semiannual groundwater monitoring for HWMUs 5 and 16 located at the Radford Army Ammunition Plant (RFAAP) in Radford, Virginia. The Second Quarter 2023 event served as the semiannual and annual Corrective Action (CA) groundwater monitoring events for HWMU-5 conducted in accordance with the *Final Hazardous Waste Post-Closure Care Permit for HWMUs 5 and 16* (reissued August 16, 2014). The Second Quarter 2023 groundwater monitoring event also served as the semiannual Compliance monitoring event for HWMU-16. The Second Quarter 2023 groundwater monitoring event was conducted using revised detection limits (DLs) and quantitation limits (QLs), where applicable, as specified in the Class 1 Permit Modification approved by the Virginia Department of Environmental Quality (VDEQ) in electronic correspondence dated May 5, 2021. Additionally, HWMU-16 total cobalt data were evaluated using the revised alternate source demonstration (ASD) for total cobalt in groundwater at HWMU-16 approved by the VDEQ in electronic correspondence dated September 13, 2021. The following information summarizes the findings of the Second Quarter 2023 semiannual monitoring activities at each Unit.

HWMU-5

For this event, all wells in the CA groundwater monitoring network were sampled for the constituents listed in Appendix J to Permit Attachment 2 (Groundwater Corrective Action Targeted Constituents - GPS and Semiannual Monitoring List for HWMU-5). The CA groundwater monitoring network for HWMU-5 consists of upgradient well 5W8B, point of compliance (POC) wells 5W5B, 5W7B, 5WC21, 5WC22, and 5WC23, and plume monitoring well 5W12A. During Second Quarter 2023, groundwater samples collected from all of the wells in the CA groundwater monitoring network were analyzed for the CA Targeted Constituents: trichloroethene (TCE) and its daughter products 1,1-dichloroethene (1,1-DCE), *cis*-1,2-dichloroethene (*c*DCE), *trans*-1,2-dichloroethene (*t*DCE), and vinyl chloride (VC). Additionally, samples collected from all of the wells in the CA groundwater monitoring network were analyzed for total cobalt, which was added to the list of CA Targeted Constituents as directed by the VDEQ on May 4, 2011.

TCE was detected in POC wells 5WC22 and 5WC23 at concentrations of 1.6 ug/l and 1.8 ug/l, respectively, which are less than the groundwater protection standard (GPS) of 5 ug/l. TCE was detected in POC well 5WC21 at a concentration less than the QL of 1 ug/l.

Total cobalt was detected in POC wells 5WC21 and 5WC22 at concentrations of 25 ug/l and 12 ug/l, respectively, which are greater than the GPS of 7 ug/l. Total cobalt was detected in POC wells 5W7B and 5WC23 at concentrations less than the QL of 5 ug/l.

TCE and total cobalt were not detected in any of the other wells in the CA groundwater monitoring network. Additionally, TCE daughter products were not detected in any of the wells comprising the CA groundwater monitoring network.

This event also served as the annual monitoring event in which the POC wells at HWMU-5 were sampled for the constituents listed in Appendix K to Permit Attachment 2 (Groundwater Corrective Action Annual Monitoring List). Annual monitoring for the constituents listed in Appendix K is required in order to evaluate whether additional hazardous constituents that are not the targets for the current CA (e.g., TCE and its daughter products) are present at concentrations greater than their respective GPSs. No other additional hazardous constituents that are not targets for the current CA for the Unit were detected at concentrations greater than their respective GPS during Second Quarter 2023.

A footnote presented in Appendix K to Permit Attachment 2 indicates that verification is required for constituents detected at concentrations less than the QL if their associated GPSs are 1) based on background values equal to the QL, and 2) are greater than the applicable risk-based concentrations (i.e., VDEQ Alternate Concentration Limit (ACL) or USEPA Regional Screening Level (RSL)). In these instances, verification must be conducted using an alternate low-level analytical method in order to confirm or refute the observed initial detections if the QL achievable by that method is less than, or equal to, the ACL or RSL for the subject constituent. If a concentration greater than the low-level analytical method QL is observed above the ACL or RSL, then a revised background concentration will be established using the low-level analytical method, if appropriate, and the GPS for that constituent will be updated, if warranted. This applies to p-nitroaniline (a.k.a, 4-nitroaniline) which has a GPS based on a background value equal to the permit-specified QL. P-nitroaniline was not detected at or above the laboratory method detection limit and no further action is needed.

HWMU-16

In accordance with the Permit, the groundwater data from the POC wells at HWMU-16 were compared to the established GPS for the Unit listed in Appendix G of Permit Attachment 3 (modified to add 1,1-dichloroethene in Class 1 Permit Modification approved September 12, 2014; modified to add tetrahydrofuran in Class 1 Permit Modification approved December 1, 2016; modified to add vinyl chloride in Class 1 Permit Modification approved May 5, 2021). The following constituents were detected in the POC wells for HWMU 16 at concentrations greater than their respective GPS:

- Total cobalt was detected in POC wells 16MW9 and 16WC1A at concentrations of 6.0 ug/l, and 18 ug/l, respectively, which are greater than the Permit-specified GPS of 5 ug/l. As directed by the VDEQ in electronic correspondence dated October 26, 2018, RFAAP also compared the total cobalt concentrations in POC wells 16MW9 and 16WC1A to the latest (effective January 12, 2023) ACL for cobalt of 6 ug/l. Additionally, the total cobalt data were evaluated using the revised ASD for total cobalt in groundwater at HWMU-16 for POC wells 16MW9, 16WC1A, and 16WC1B approved by the VDEQ in electronic correspondence dated September 13, 2021. Based on the conclusions of the VDEQ-approved ASD, the Second Quarter 2023 total cobalt concentrations detected in POC wells 16MW9 and 16WC1A appear to be consistent with natural variation in local groundwater and are not indicative of a release from the Unit. Therefore, a verification event will not be conducted for the Second Quarter 2023 total cobalt concentrations detected in POC wells 16MW9 and 16WC1A. As well, based on VDEQ correspondence dated September 13, 2021, a separate ASD will not be required. Total cobalt was not detected at concentrations greater than the Permit-specified GPS or the latest VDEQ ACL in the other POC wells during Second Quarter 2023.

No other constituents were detected in the upgradient well or in the POC wells at concentrations greater than their respective GPS during Second Quarter 2023.

The following constituents were detected at concentrations greater than their respective background concentrations in plume monitoring wells:

- Total barium was detected in plume monitoring wells 16-2, 16-3, 16-5 and 16Spring at concentrations of 230 ug/l, 820 ug/l, 180 ug/l, and 230 ug/l, respectively, which are greater than the site-specific background concentration of 175.4 ug/l. However, these concentrations are less than the USEPA maximum contaminant level (MCL) drinking water standard for barium of 2,000 ug/l. Higher total barium concentrations in downgradient plume monitoring wells relative to background at HWMU-16 may be the result of natural variations in trace element distribution in groundwater. As illustrated in the boring logs for the compliance network monitoring wells (Appendix H of Permit Attachment 3), upgradient well 16C1 is screened in limestone while downgradient plume monitoring wells (16-2, 16-3, and 16-5) and former plume well (now piezometer) 16-1 are screened in shale and fault breccia. Such differing lithologic formations would be expected to contain very different trace element distributions. Therefore, no further action regarding the Second Quarter 2023 total barium concentrations detected in plume monitoring wells 16-2, 16-3, 16-5 and 16Spring is recommended at this time.

Total barium was detected in plume monitoring well 16WC2B at a concentration of 120 ug/l, which is less than the site-specific background concentration of 175.4 ug/l. No other constituents were detected in the plume monitoring wells at concentrations greater than their respective Permit-specified QLs.

Complete details regarding the Second Quarter 2023 monitoring event (field data, laboratory data, and data validation reports) will be forwarded to the VDEQ in the forthcoming *Semiannual Groundwater Monitoring Report for Hazardous Waste Management Units 5 and 16, Second Quarter 2023*, which is due by August 15, 2023.

If you have any questions or concerns, please contact me at 540/639-7087 (Melissa.Lincoln@baesystems.com).

Sincerely,

Melissa Lincoln

Digitally signed by Melissa Lincoln
Date: 2023.06.26 11:06:27 -04'00'

Melissa Lincoln
Environmental Specialist
BAE Systems, Ordnance Systems Inc.

Coordination: DIIOIA.LEONARD.LOUIS.JR.1258338509

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Date: 2023.06.26 13:25:51 -04'00'

L. DiIoia

cc: Nikki Herschler, VDEQ-BRRO
Tara Mason, Ashby Scott, VDEQ-CO
L. DiIoia, Army Staff
Sheree Andrews, BAE Staff
Mike Lawless, TRC, Engineers, Inc. (formerly Draper Aden Associates)
Janet Frazier, TRC, Engineers, Inc. (formerly Draper Aden Associates)
William Mason-Deese, TRC, Engineers, Inc. (formerly Draper Aden Associates)

Env. File

Concerning the following:

CY 2023 Second Quarter Semiannual Monitoring Event
Hazardous Waste Management Units 5 – Corrective Action Groundwater Monitoring
Hazardous Waste Management Unit 16 – Compliance Groundwater Monitoring
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE: HUMPHREYS.ADRIEN.GERMAINE.1181439641 Digitally signed by HUMPHREYS.ADRIEN.GERMAINE.1181439641 Date: 2023.06.26 15:22:10 -04'00'

PRINTED NAME: Adrien G. Humphreys
TITLE: Lieutenant Colonel, US Army
Commanding

SIGNATURE: Kirk Johnson Digitally signed by Kirk Johnson Date: 2023.06.26 13:45:20 -04'00'

PRINTED NAME: Kirk Johnson
TITLE: General Manager
BAE Systems

ORDNANCE SYSTEMS INC.
Radford Army Ammunition Plant
4050 Pepper's Ferry Road
Radford Virginia 24141

August 9, 2023

Mr. Kurt Kochan
Office of Remediation Programs
Virginia Department of Environmental Quality
1111 East Main Street, Suite 1400
Richmond, Virginia 23218

Subject: Semiannual Groundwater Monitoring Report –
HWMU-5 and HWMU-16
Post Closure Care Permit HWMUs 5 & 16
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

Dear Mr. Kochan:

The Hazardous Waste Management Units (HWMUs) 5 & 16 Semiannual Groundwater Monitoring Report for Second Quarter 2023 can be accessed at:

File 1 of 3 - RPT - 23 07126- 2Qtr 2023 SA GW Monitoring Report Units 5-16

https://adhocftp.trccompanies.com:443/AHT/AHT_UI/public/#/password?package=qziQ7bI%2fWGnyuH0uat4%2b3c1jC23tVPq1ThJKJlgs3ADrwl8bZeZRaoD3TGKljuT5Q9v4fjoITbGWzV88yePv%2bPH%2byMNajcpiyHAC%2bbuGQYo%3d

File 2 of 3 - RPT - 23 07126- 2Qtr 2023 SA GWM Report Units 5-16 - App B Lab Data 1of 2

https://adhocftp.trccompanies.com:443/AHT/AHT_UI/public/#/password?package=oZigLf6PY3dFFLGgmFWDmxuvSPmh%2bc1iLpIk0Sf9ZBt9gZGgE0jfi89OVSHAwNJ1DQYDn4QKALMii8hVauCwvxYQCaYCuW9uArW0Khby2u0%3d

File 3 of 3 - RPT - 23 07126- 2Qtr 2023 SA GWM Report Units 5-16 - App B Lab Data 2of 2

https://adhocftp.trccompanies.com:443/AHT/AHT_UI/public/#/password?package=kpbBn6JxQnRLEqTAqYhhkTrES3fiTOR4666yYPNHQL0zuNvfm9htAuk5Ag%2flbG6XbfvOrDyyAwnsgE%2bMc%2bCvyn6mC7gIUGp2MR5yFGjui5E%3d

The above links are valid for 30 days. This report meets the requirements of the Semiannual Groundwater Monitoring Report for Second Quarter 2023 for the Post-Closure Care Permit for HWMU 5 and 16 at RFAAP.

23-0900-119
Lincoln

If you have any questions or concerns, please contact me at 540/639-7087 (Melissa.lincoln@baesystems.com).

Sincerely,

Melissa Lincoln

Digitally signed by Melissa Lincoln
Date: 2023.08.09 16:46:56 -04'00'

Melissa Lincoln
Environmental Specialist
BAE Systems, Ordnance Systems Inc.

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Date: 2023.08.10 09:40:55 -04'00'

L. DiIoia

cc: Nikki Herschler, VDEQ- BRRO
Tara Mason, Ashby Scott, VDEQ-CO
L. DiIoia, Army Staff
Mike Lawless, TRC Engineers, Inc (formerly Draper Aden Associates)
Janet C. Frazier, TRC Engineers, Inc (formerly Draper Aden Associates)
William Mason-Deese, TRC Engineers, Inc (formerly Draper Aden Associates)
Env. File

Concerning the following:

CY 2023 Second Quarter Semiannual Groundwater Monitoring Event
Hazardous Waste Management Units 5 – Correction Action Groundwater Monitoring
Hazardous Waste Management Unit 16 – Compliance Groundwater Monitoring
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE: DAVIE.ROBERT.N.III.1066962306 Digitally signed by DAVIE.ROBERT.N.III.1066962306 Date: 2023.08.10 15:49:59 -04'00'

PRINTED NAME: Adrien G. Humphreys
TITLE: Lieutenant Colonel, US Army
Commanding

SIGNATURE: Kirk Johnson Digitally signed by Kirk Johnson Date: 2023.08.10 11:50:53 -04'00'

PRINTED NAME: Kirk Johnson
TITLE: General Manager
BAE Systems

Commonwealth of Virginia

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

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P.O. Box 1105, Richmond, Virginia 23218
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Travis A. Voyles
Secretary of Natural and Historic Resources

Michael S. Rolband, PE, PWD, PWS Emeritus
Director
(804) 698-4020

August 16, 2023

VIA ELECTRONIC MAIL
Ms. Melissa Lincoln
Interim Environmental Manager
BAE Systems, Ordnance Systems, Inc.
Radford Army Ammunition Plant
4050 Pepper's Ferry Road
Radford, Virginia 24141

Re: Renewal Application for Reissuance of Facility's Post-Closure Care Permit
Radford Army Ammunition Plant, Radford, VA
EPA ID No.VA1210020730

Dear Ms. Andrews:

On July 17, 2014, the Department of Environmental Quality's (DEQ) Office of Financial Responsibility and Waste Programs (OFRWP) issued a Hazardous Waste Management Permit for Post-Closure Care (Permit) to the Radford Army Ammunition Plant (RAAP), Radford, VA facility under EPA ID No. VA1210020730. The Permit became effective on August 16, 2014, and will expire on August 16, 2024.

In accordance with the Virginia Hazardous Waste Management Regulations (VHWMR), 9 VAC 20-60-270, and as incorporated by reference, under 40 CFR Part 270, §270.10(h*), Any hazardous waste management (HWM) facility with an effective permit shall submit a new application at least 180 days before the expiration date of the effective permit, unless permission for a later date has been granted by the Director. (The Director shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)*

Therefore, the DEQ is requesting that RAAP submit the Part A and Part B of the RCRA Hazardous Waste Permit Application (Application) no later than February 16, 2024, unless the RAAP facility requests permission from the Director to submit the application at a later date. Please remember that the application cannot be submitted later than the expiration date of the existing Permit.

Please submit the Application to this Office in the form of two hard copies, an electronic copy in PDF format and an electronic copy in Microsoft WORD format, and submit the Application to the EPA, Region III and the DEQ's Blue Ridge Regional Office in the electronic PDF format. Please be advised that the DEQ requires all sections of the Application to be in an electronic format, including drawings. The DEQ does not have the capability to copy large drawings, i.e., anything over 11 inches by 17 inches. Paper copying is required to Public Notice the draft permit when it is distributed to those who don't have e-mail access and upon final renewal of the permit.

Please submit a check or money order payable to the "Treasurer of Virginia." for the permit application fee of $56,180.00 required under 9VAC 20-60-1285. Permit processing by this Office is not authorized unless the fee has been received.

Please include with the check or money order a copy of the letter transmitting the permit application submittal to the DEQ. The permit application payment should be mailed to the following address:

Department of Environmental Quality
Receipts Control
P. O. Box 1104
Richmond, Virginia 23218

Please submit the permit application, along with a copy of the check or money order, to the attention of Mr. Ashby Scott, Hazardous Waste Permit Writer, Office of Financial Responsibility and Waste Programs, at 1111 East Main St., Suite 1400, Richmond, Virginia, 23219, or at P.O. Box 1105, Richmond, Virginia, 23218.

If you have any questions concerning this letter or would like to arrange for a pre-application meeting, please contact me at (804) 350-5623 or by email at Ashby.Scott@deq.virginia.gov.

Sincerely,

Ashby R. Scott
Hazardous Waste Permit Writer
Office of Financial Responsibility and
Waste Programs

cc: Jacqueline Morrison, EPA, Region III (3LC50)
Nikki Herschler, Rebecca Wright – DEQ, BRRO
Leslie Romanchik, Tara Mason, Kurt Kochan, Brian Burton, Kim Hughes – DEQ, CO
Central Office Hazardous Waste File – DEQ, CO

Leonard Diioia, Radford Army Ammunition Plant

ORDNANCE SYSTEMS INC.
Radford Army Ammunition Plant
P.O. Box 1
Radford, VA 24143
Telephone (540) 639-7631
Fax (540) 639-8588

October 2, 2023

Mr. Kurt Kochan
Office of Remediation Programs
Virginia Department of Environmental Quality
1111 East Main Street, Suite 1400
Richmond, Virginia 23218

Subject: Semiannual Corrective Action Groundwater Monitoring Event Notification – HWMU-5
Semiannual Compliance Monitoring and Annual Detection Notification – HWMU-16
Post Closure Care Permit HWMUs 5 & 16
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

Dear Mr. Kochan:

The following information pertains to routine detection notification for the recent groundwater monitoring event for Hazardous Waste Management Units (HWMUs) 5 and 16 located at the Radford Army Ammunition Plant (RFAAP) in Radford, Virginia.

Groundwater Monitoring Event Notification - HWMU-5 and HWMU-16

During Third Quarter 2023, BAE Systems, Ordnance Systems Inc. (BAE) completed groundwater monitoring for HWMUs 5 and 16 in accordance with the *Final Hazardous Waste Post-Closure Care Permit for HWMUs 5 and 16* (reissued August 16, 2014). The Third Quarter 2023 event served as the semiannual Corrective Action (CA) groundwater monitoring event for HWMU-5 and the semiannual compliance monitoring event for HWMU-16. The Third Quarter 2023 groundwater monitoring event also served as the annual monitoring event under 40 CFR 264 Appendix IX for HWMU-16. The laboratory analytical data packages for this event were received on September 25, 2023. The Third Quarter 2023 groundwater monitoring event was conducted using revised detection limits (DLs) and quantitation limits (QLs), where applicable, as specified in the Class 1 Permit Modification approved by the Virginia Department of Environmental Quality (VDEQ) in electronic correspondence dated May 5, 2021. Additionally, HWMU-16 total cobalt data were evaluated using the revised alternate source demonstration (ASD) for total cobalt in groundwater at HWMU-16 approved by the VDEQ in electronic correspondence dated September 13, 2021. The following information summarizes the findings of the Third Quarter 2023 semiannual activities at each Unit.

HWMU-5

For this event, all wells in the CA groundwater monitoring network were sampled for the constituents listed in Appendix J to Permit Attachment 2 (Groundwater Corrective Action Targeted Constituents - GPS and Semiannual Monitoring List for HWMU-5). The CA groundwater monitoring network for HWMU-5 consists of upgradient well 5W8B, point of compliance (POC) wells 5W5B, 5W7B, 5WC21, 5WC22, and 5WC23, and plume monitoring well 5W12A. During Third Quarter 2023, groundwater samples collected from all of the wells in the CA groundwater monitoring network were analyzed for the CA Targeted Constituents: trichloroethene (TCE) and its daughter products 1,1-dichloroethene (1,1-DCE), *cis*-1,2-dichloroethene (*c*DCE), *trans*-1,2-dichloroethene (*t*DCE), and vinyl chloride (VC). Additionally, samples collected from all of the wells in the CA groundwater monitoring network were analyzed for total cobalt, which was added to the list of CA Targeted Constituents as directed by the VDEQ on May 4, 2011.

TCE was detected in POC wells 5WC22 and 5WC23 at concentrations of 1.6 ug/l and 1.7 ug/l respectively, which are less than the GPS of 5 ug/l. TCE was detected in POC well 5WC21 at a concentration less than the QL of 1 ug/l.

Total cobalt was detected in POC wells 5WC21 and 5WC22 at concentrations of 27 ug/l and 26 ug/l, respectively, which are greater than the GPS of 7 ug/l. Total cobalt was detected in POC well 5W7B at a concentration of 6.7 ug/l which is less than the GPS.

TCE and total cobalt were not detected in any of the other wells in the CA groundwater monitoring network. Additionally, the TCE daughter products were not detected in any of the wells comprising the CA groundwater monitoring network.

As stated in the Annual Groundwater Monitoring Reports for the Unit for calendar years 2015 through 2022, TCE remedial endpoints have been achieved. During Second and Third Quarters 2023, TCE was not detected at concentrations greater than its GPS in any of the wells comprising the CA groundwater monitoring network for HWMU-5. Additionally, no daughter products of TCE were detected in any of the wells comprising the CA groundwater monitoring network for HWMU-5; therefore, TCE remedial objectives continue to be met. However, total cobalt continued to be detected at concentrations greater than its GPS during Second and Third Quarters 2023.

No changes to the continuation of the groundwater CA program are anticipated at this time. An evaluation of the effectiveness of the Corrective Action will be presented in the forthcoming Annual Groundwater Monitoring Report for Units 5 and 16, which is due to the VDEQ on March 1, 2024.

HWMU-16

In accordance with the Permit, the groundwater data from the POC wells at HWMU-16 were compared to the established GPS for the Unit listed in Appendix G of Permit Attachment 3 (modified to add 1,1-dichloroethene, tetrahydrofuran, and vinyl chloride in Class 1 Permit Modifications approved September 12, 2014, December 1, 2016, and May 5, 2021, respectively). The following constituents were detected in the POC wells for HWMU-16 at concentrations greater than their respective GPS:

- Total cobalt was detected in POC wells 16MW9 and 16WC1A at concentrations of 5.7 ug/l and 15 ug/l, respectively, which are greater than the GPS of 5 ug/l. As directed by the VDEQ in electronic correspondence dated October 26, 2018, RFAAP also compared the total cobalt concentrations detected in POC well 16MW9 and 16WC1A to the latest (effective January 12, 2023) VDEQ Alternate Concentration Limit (ACL) for cobalt of 6 ug/l. Additionally, the total cobalt data were evaluated using the revised ASD for total cobalt in groundwater at HWMU-16 for POC wells 16MW9, 16WC1A, and 16WC1B approved by the VDEQ in electronic correspondence dated September 13, 2021. Based on the conclusions of the VDEQ-approved ASD, the Third Quarter 2023 total cobalt concentrations detected in POC wells 16MW9 and 16WC1A appear to be consistent with natural variation in local groundwater and are not indicative of a release from the Unit. Therefore, a verification event will not be conducted for the Third Quarter 2023 total cobalt concentrations detected in POC wells 16MW9 and 16WC1A. As well, based on VDEQ correspondence dated September 13, 2021, a separate ASD will not be required.

No other constituents were detected in the upgradient well or in the POC wells at concentrations greater than their respective GPS during Third Quarter 2023.

The following constituents were detected at concentrations at or above their respective background concentrations in plume monitoring wells:

- Total barium was detected in plume monitoring wells 16-2, 16-3, 16-5, and 16Spring at concentrations of 240 ug/l, 800 ug/l, 180 ug/l, and 220 ug/l, respectively, which are greater than the site-specific background concentration of 175.4 ug/l. However, these concentrations are less than the USEPA maximum contaminant level (MCL) drinking water standard for barium of 2,000 ug/l. Higher total barium concentrations in downgradient plume monitoring wells relative to background at HWMU-16 may be the result of natural variations in trace element distribution in groundwater. As illustrated in the boring logs for the compliance network monitoring wells (Appendix H of Permit Attachment 3), upgradient well 16C1 is screened in limestone while downgradient plume monitoring wells (16-2, 16-3, and 16-5) are screened in shale and fault breccia. Such differing lithologic formations would be expected to contain very different trace element distributions. Therefore, no further action regarding the Third Quarter 2023 total barium

concentrations detected in plume monitoring wells 16-2, 16-3, 16-5 and 16Spring is recommended at this time.

Total barium was detected in plume monitoring well 16WC2B at a concentration of 120 ug/l, which is less than the site-specific background concentration of 175.4 ug/l. No other constituents were detected in the plume monitoring wells at concentrations greater than their respective Permit-specified QLs.

This event also served as the annual monitoring event in which the upgradient and POC wells at HWMU-16 were sampled for the 40 CFR Part 264 Appendix IX constituents listed in Appendix I of Permit Attachment 1. As presented in the table below, during the Third Quarter 2023 event, two Appendix IX constituents (total silver in POC well 16WC1B and cyanide in POC well 16MW9 and upgradient well 16C1) were initially detected at or above the respective Permit-specified MDLs. **A verification event will be conducted on October 5, 2023**, to confirm or refute the initial detections of total silver in POC well 16WC1B and cyanide in POC well 16MW9.

Well Location	July 26-27, 2023 Initial Result (ug/l)	Lab QL (ug/l)	Lab MDL (ug/l)	Permit QL (ug/l)	Permit MDL (ug/l)
Silver, Total					
16WC1B	0.34 J	2.0	0.3	2.0	0.3
Cyanide, Total					
16C1	7.5 J	20	5	20	5
16MW9	6.7 J	20	5	20	5

Note: MDL denotes method detection limit.
J denotes analyte detected less than the quantitation limit (QL) and concentration is estimated.
U denotes not detected at or above the MDL.

A verification sample will not be collected from upgradient well 16C1, as monitoring well 16C1 is the background well rather than a POC well. Sampling of upgradient well 16C1 for Appendix IX constituents is not required per the Permit; therefore, cyanide will be added to the groundwater compliance monitoring list for HWMU-16 **only** if it is verified in POC well 16MW9.

In correspondence dated June 12, 2019, the VDEQ authorized continued use of the historical laboratory DL of 50 ug/l for 2-propanol during annual monitoring of the constituents listed in Appendix I of Permit Attachment 1. However, VDEQ requested an annual survey of laboratories maintaining 2-propanol accreditation under the VELAP for a period of at least three (3) years (i.e., 2020, 2021, 2022) to verify that the lower DL of 18 ug/l for 2-propanol reported by ELLE of Lancaster, Pennsylvania during the Second Quarter 2019 monitoring event cannot be routinely achieved by other VELAP accredited laboratories. VDEQ also requested including this survey as an appendix in subsequent annual reports. A summary of the requested 2-propanol survey was presented in the 2022 Annual report. In correspondence dated April 19, 2023, the VDEQ accepted the survey as complete and authorized continued use of the historical laboratory DL of 50 ug/l for 2-propanol for future monitoring events.

To summarize, **verification event samples will be collected from POC wells 16WC1B and 16MW9** on October 5, 2023, to confirm or refute the initial reported detections discussed above.

Complete details regarding the Third Quarter 2023 monitoring event (field data, laboratory data, and data validation reports) will be forwarded to the VDEQ in the forthcoming *Semiannual Groundwater Monitoring Report for Hazardous Waste Management Units 5 and 16, Third Quarter 2023*, which will be combined with the 2023 Annual Groundwater Monitoring Report for the Units as directed by VDEQ on May 4, 2011. The 2023 Annual Groundwater Monitoring Report is due to VDEQ by March 1, 2024.

If you have any questions or concerns, please contact me at 540/639-7087 (Melissa.lincoln@baesystems.com).

Sincerely,

Melissa Lincoln

Digitally signed by Melissa Lincoln
Date: 2023.10.02 10:59:42 -04'00'

Melissa Lincoln
Environmental Specialist
BAE Systems, Ordnance Systems Inc.

Coordination: DIIOIA.LEONARD.LOUIS.JR.1258338509

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Date: 2023.10.02 12:48:15 -04'00'

L. DiIoia

cc: Nikki Herschler, VDEQ-BRRO
Tara Mason, Ashby Scott, VDEQ-CO
L. DiIoia, Army Staff
Mike Lawless, TRC Engineers, Inc (formerly Draper Aden Associates)
Janet C. Frazier, TRC Engineers, Inc (formerly Draper Aden Associates)
Will Mason-Deese, TRC Engineers, Inc (formerly Draper Aden Associates)
Env. File

Concerning the following:

CY 2023 Third Quarter Semiannual and Annual Monitoring Event
Hazardous Waste Management Units 5 – Corrective Action Groundwater Monitoring
Hazardous Waste Management Unit 16 – Compliance Groundwater Monitoring
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE: HUMPHREYS.ADRIEN.GERMAINE.1181439641 Digitally signed by HUMPHREYS.ADRIEN.GERMAINE.1181439641 Date: 2023.10.03 09:09:44 -04'00'

PRINTED NAME: Adrian G. Humphreys
TITLE: Lieutenant Colonel, US Army
Commanding

SIGNATURE: William T Yates Digitally signed by William T Yates Date: 2023.10.03 06:50:16 -04'00'

PRINTED NAME: William (Tom) Yates
TITLE: Interim General Manager
BAE Systems

BAE SYSTEMS

ORDNANCE SYSTEMS INC.
Radford Army Ammunition Plant
P.O. Box 1
Radford, VA 24143
Telephone (540) 639-7631
Fax (540) 639-8588

October 20, 2023

Mr. Kurt Kochan
Office of Remediation Programs
Virginia Department of Environmental Quality
1111 East Main Street, Suite 1400
Richmond, Virginia 23219

Subject: Verification Event Notification – HWMU-16
Post Closure Care Permit HWMUs 5 & 16
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

Dear Mr. Kochan:

During Third Quarter 2023, BAE Systems, Ordnance Systems Inc. (BAE) completed semiannual groundwater monitoring for HWMUs 5 and 16 located at the Radford Army Ammunition Plant (RFAAP) in Radford, Virginia. The Third Quarter 2023 groundwater monitoring event also served as the annual monitoring event under 40 CFR 264 Appendix IX for HWMU-16.

Initial results of the Third Quarter 2023 groundwater monitoring event at HWMU-16 indicated additional Appendix IX constituents total silver and cyanide were detected at estimated concentrations greater than their respective permit detection limits (DLs) in point of compliance (POC) wells 16WC1B and 16MW9, respectively.

POC well 16WC1B was originally sampled on July 26, 2023 and POC well 16MW9 was sampled on July 27, 2023. Final sample results from the original monitoring event were received on September 25, 2023. Permit Section V.J.2.e states "The Permittees may resample within (60) days from date of the original sampling and repeat the analysis for the detected Appendix IX to 40 CFR 264 constituent." Laboratory results for the Third Quarter 2023 groundwater monitoring event were received on day 60 from the original sampling event. This delay in receipt of laboratory results is attributed to the complexity of the recent permit modification requirements associated with the annual Appendix IX monitoring event. For this event, four laboratories are contracted in order to meet permit quantitation limits (QLs) and permit DLs for numerous and diverse Appendix IX constituents of concern.

The subsequent verification event to confirm or refute the total silver result in POC well 16WC1B and cyanide result in POC well 16MW9 was conducted on October 5, 2023. During the October 5, 2023, verification monitoring event, POC well 16WC1A was mistakenly sampled instead of POC well 16WC1B. POC 16WC1B was subsequently sampled for total silver on October 18, 2023. Final cyanide results for POC well 16MW9 were received on October 18, 2023.

Below summarizes the cyanide verification event results. Verification sampling results indicated that cyanide was not detected at or above the permit DL in POC well 16MW9 or the blind field duplicate for 16MW9, and no additional action is required. The 16WC1B total silver verification sample result remains pending and will be submitted under a separate notification letter following data receipt.

Well Location	Third Qtr 2023 Initial Event (July 27, 2023) Result (ug/l)	October 5, 2023 Verification Event Result (ug/l)	Permit Detection Limit (ug/l)	Lab Detection Limit (ug/l)	Laboratory
Cyanide					
16MW9	6.7 J	ND ND (blind duplicate)	5	5	Eurofins, Lancaster, PA (ELLE)

Note: Initial sampling event July 27, 2023 for 16MW9
ND Denotes analyte not detected at or above the detection limit (DL).
J Denotes analyte detected less than the quantitation limit (QL) and concentration is estimated.

Complete details regarding the Third Quarter 2023 monitoring event (field data, laboratory data, and data validation reports) will be forwarded to the Virginia Department of Environmental Quality (VDEQ) in the forthcoming *Semiannual Groundwater Monitoring Report for Hazardous Waste Management Units 5 and 16, Third Quarter 2023*, which will be combined with the 2023 Annual Groundwater Monitoring Report for the Units as directed by VDEQ on May 4, 2011. The 2023 Annual Groundwater Monitoring Report is due to VDEQ by March 1, 2024.

If you have any questions or concerns, please contact me at 540/639-7087 (melissa.lincoln@baesystems.com).

Sincerely,

Melissa Lincoln

Digitally signed by Melissa Lincoln
Date: 2023.10.20 10:58:09 -04'00'

Melissa Lincoln
Environmental Specialist
BAE Systems, Ordnance Systems Inc.

Coordination: DIIOIA.LEONARD.LOUIS.JR.1258338509

Digitally signed by DIIOIA.LEONARD.LOUIS.JR.1258338509
Date: 2023.10.23 07:24:59 -04'00'

L. DiIoia

cc: Nikki Herschler, VDEQ-BRRO
Tara Mason, Ashby Scott, VDEQ-CO
L. DiIoia, Army Staff
Mike Lawless, TRC Engineers, Inc. (formerly Draper Aden Associates)
Janet C. Frazier, TRC Engineers, Inc. (formerly Draper Aden Associates)
Will Mason-Deese, TRC Engineers, Inc. (formerly Draper Aden Associates)
Env. File

Concerning the following:

CY 2023 Third Quarter Semiannual and Annual Monitoring Event – Verification Event
Hazardous Waste Management Units 5 – Corrective Action Groundwater Monitoring
Hazardous Waste Management Unit 16 – Compliance Groundwater Monitoring
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE: HUMPHREYS.ADRIEN.GERMAINE.1181439641 Digitally signed by HUMPHREYS.ADRIEN.GERMAINE.1181439641 Date: 2023.10.31 07:33:37 -04'00'

PRINTED NAME: Adrian G. Humphreys
TITLE: Lieutenant Colonel, US Army
Commanding

SIGNATURE: William T Yates Digitally signed by William T Yates Date: 2023.10.30 15:43:54 -04'00'

PRINTED NAME: William (Tom) Yates
TITLE: Interim General Manager
BAE Systems

ORDNANCE SYSTEMS INC.
Radford Army Ammunition Plant
P.O. Box 1
Radford, VA 24143
Telephone (540) 639-7631
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October 30, 2023

Mr. Kurt Kochan
Office of Remediation Programs
Virginia Department of Environmental Quality
1111 East Main Street, Suite 1400
Richmond, Virginia 23219

Subject: Verification Event Notification – HWMU-16
Post Closure Care Permit HWMUs 5 & 16
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

Dear Mr. Kochan:

During Third Quarter 2023, BAE Systems, Ordnance Systems Inc. (BAE) completed semiannual groundwater monitoring for HWMUs 5 and 16 located at the Radford Army Ammunition Plant (RFAAP) in Radford, Virginia. The Third Quarter 2023 groundwater monitoring event also served as the annual monitoring event under 40 CFR 264 Appendix IX for HWMU-16.

Initial results of the Third Quarter 2023 groundwater monitoring event at HWMU-16 indicated additional Appendix IX constituents total silver and cyanide were detected at estimated concentrations greater than their respective permit detection limits (DLs) in point of compliance (POC) wells 16WC1B and 16MW9, respectively.

The subsequent verification event to confirm or refute the total silver result in POC well 16WC1B and the cyanide result in POC well 16MW9 was conducted on October 5, 2023. During the October 5, 2023, verification monitoring event, POC well 16WC1A was mistakenly sampled instead of POC well 16WC1B. POC well 16WC1B was subsequently sampled for total silver on October 18, 2023. Final cyanide results for POC well 16MW9 were reported to VDEQ on October 25, 2023, and no additional action was required. Final total silver results for POC well 16WC1B were received on October 27, 2023.

Below summarizes the total silver verification event results. Verification sampling results confirm the presence of total silver in POC well 16WC1B at an estimated concentration of 0.59 J ug/l; therefore, the original estimated total silver concentration of 0.34 J ug/l in POC well 16WC1B is confirmed. **RFAAP will submit a Class 1 Permit Modification to add total silver to the Groundwater Monitoring Compliance list for HWMU-16.**

Well Location	Third Qtr 2023 Initial Event (July 26, 2023) Result (ug/l)	October 18, 2023 Verification Event Result (ug/l)	Permit Detection Limit (ug/l)	Lab Detection Limit (ug/l)	Laboratory
Total Silver					
16WC1B	0.34 J	0.59 J 0.62 J (blind duplicate)	0.3	0.3	Eurofins, Lancaster, PA (ELLE)

Notes: ND denotes analyte not detected at or above the detection limit (DL).
J denotes analyte detected less than the quantitation limit (QL) and concentration is estimated.

The Permit requires collection of four quarters of monitoring data from a Unit's upgradient well(s) to establish background values for newly detected Appendix IX constituents. Please note that the Compliance Monitoring List for HWMU-16 previously included total silver when the Permit was issued in 2002. The background value for total silver presented in the Permit at that time was calculated based on the laboratory method detection limit (MDL) rather than

quantitation limit (QL) as presented in the August 1999 Groundwater Quality Assessment Report that was included in the Post-Closure Care Permit Application Part B for the Unit. The VDEQ removed total silver from the Compliance Monitoring List for HWMU-16 due to lack of detection with approval of the Class 3 Permit Modification dated September 27, 2011; however, annual monitoring for total silver continued with the annual monitoring of constituents listed in 40 CFR Appendix IX. Therefore, RFAAP has collected total silver data from HWMW-16 upgradient monitoring well 16C1 during the past 21 annual Appendix IX groundwater monitoring events (2003-2023). Total silver has never been detected at or above the Permit-specified QL in upgradient well 16C1 during the Compliance Monitoring Program; therefore, in lieu of quarterly background monitoring, we propose to use these data to redefine the background value for total silver as the Permit-specified QL of 2 ug/l. Additionally, there is no USEPA Maximum Contaminant Level (MCL) for total silver; therefore, we propose to use the latest (effective January 12, 2023) VDEQ Alternate Concentration Limit (ACL) for total silver of 94 ug/l as the Groundwater Protection Standard (GPS).

In summary, in accordance with Permit Condition V.J.2.i.(3)(c), total silver will be added to the HWMU-16 Compliance Monitoring List (Appendix E of Permit Attachment 3). Additionally, since the constituent is listed in Appendix VIII to 40 CFR, as required by the Permit, total silver will be added to the Groundwater Protection Standard (GPS) list (Appendix G of Permit Attachment 3). **A Class 1 Permit Modification to add total silver to the Groundwater Monitoring Compliance list for HWMU-16 will be submitted to VDEQ.**

Complete details regarding the Third Quarter 2023 monitoring event (field data, laboratory data, and data validation reports) will be forwarded to the VDEQ in the forthcoming *Semiannual Groundwater Monitoring Report for Hazardous Waste Management Units 5 and 16, Third Quarter 2023*, which will be combined with the 2023 Annual Groundwater Monitoring Report for the Units as directed by VDEQ on May 4, 2011. The 2023 Annual Groundwater Monitoring Report is due to VDEQ by March 1, 2024.

If you have any questions or concerns, please contact me at 540/639-7087 (melissa.lincoln@baesystems.com).

Sincerely,

Melissa Lincoln

Digitally signed by Melissa Lincoln
Date: 2023.10.30 16:27:50 -04'00'

Melissa Lincoln
Environmental Specialist
BAE Systems, Ordnance Systems Inc.

Coordination: DIIOIA.LEONARD.LOUIS.JR.1258338509

Digitally signed by DIIOIA.LEONARD.LOUIS.JR.1258338509
Date: 2023.10.31 07:00:39 -04'00'

L. DiIoia

cc: Nikki Herschler, VDEQ-BRRO
Tara Mason, Ashby Scott, VDEQ-CO
L. DiIoia, Army Staff
Mike Lawless, TRC Engineers, Inc. (formerly Draper Aden Associates)
Janet C. Frazier, TRC Engineers, Inc. (formerly Draper Aden Associates)
Will Mason-Deese, TRC Engineers, Inc. (formerly Draper Aden Associates)
Env. File

Concerning the following:

CY 2023 Third Quarter Semiannual and Annual Monitoring Event
Verification Event (October 18, 2023)
Hazardous Waste Management Units 5 – Corrective Action Groundwater Monitoring
Hazardous Waste Management Unit 16 – Compliance Groundwater Monitoring
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE: HUMPHREYS.ADRIEN.GERMAINE.1181439641 Digitally signed by HUMPHREYS.ADRIEN.GERMAINE.1181439641 Date: 2023.11.03 09:32:54 -04'00'

PRINTED NAME: Adrian G. Humphreys
TITLE: Lieutenant Colonel, US Army
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SIGNATURE: William T Yates Digitally signed by William T Yates Date: 2023.10.31 07:47:28 -04'00'

PRINTED NAME: William (Tom) Yates
TITLE: Interim General Manager
BAE Systems

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = OW; R = ORD; N = WI; W = TEF applied; E = RPF applied; G = see user's guide; c = cancer; n = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded; V = volatile; M = mutagen.

Toxicity and Chemical-specific Information													Contaminant		Screening Levels										Protection of Groundwater SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tap Water (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
				3.0E-04	O					1	0.1		Acephate	30560-19-1	1.9E+01	n	2.5E+02	n					6.0E+00	n		1.3E-03	n	
		2.2E-06	I			9.0E-03	I	V		1		1.1E+05	Acetaldehyde	75-07-0	1.1E+01	c**	4.9E+01	c**	1.3E+00	c**	5.6E+00	c**	2.6E+00	c**		5.2E-04	c**	
				2.0E-02	I					1	0.1		Acetochlor	34256-82-1	1.3E+03	n	1.6E+04	n					3.5E+02	n		2.8E-01	n	
				9.0E-01	I			V		1		1.1E+05	Acetone	67-64-1	7.0E+04	n	1.1E+06	nms					1.8E+04	n		3.7E+00	n	
						2.0E-03	X			1	0.1		Acetone Cyanohydrin	75-86-5	2.8E+06	nm	1.2E+07	nm	2.1E+00	n	8.8E+00	n						
						6.0E-02	I	V		1		1.3E+05	Acetonitrile	75-05-8	8.1E+02	n	3.4E+03	n	6.3E+01	n	2.6E+02	n	1.3E+02	n		2.6E-02	n	
				1.0E-01	I			V		1		2.5E+03	Acetophenone	98-86-2	7.8E+03	ns	1.2E+05	nms					1.9E+03	n		5.8E-01	n	
3.8E+00	C	1.3E-03	C							1	0.1		Acetylaminofluorene, 2-	53-96-3	1.4E-01	c	6.0E-01	c	2.2E-03	c	9.4E-03	c	1.6E-02	c		7.5E-05	c	
				5.0E-04	I	2.0E-05	I	V		1		2.3E+04	Acrolein	107-02-8	1.4E-01	n	6.0E-01	n	2.1E-02	n	8.8E-02	n	4.2E-02	n		8.4E-06	n	
5.0E-01	I	1.0E-04	I	2.0E-03	I	6.0E-03	I		M	1	0.1		Acrylamide	79-06-1	2.4E-01	c	4.6E+00	c	1.0E-02	c	1.2E-01	c	5.0E-02	c		1.1E-05	c	
				5.0E-01	I	2.0E-04	P	V		1		1.1E+05	Acrylic Acid	79-10-7	2.0E+01	n	8.3E+01	n	2.1E-01	n	8.8E-01	n	4.2E-01	n		8.5E-05	n	
5.4E-01	I	6.8E-05	I	1.0E-03	H	2.0E-03	I	V		1		1.1E+04	Acrylonitrile	107-13-1	2.5E-01	c*	1.1E+00	c*	4.1E-02	c*	1.8E-01	c*	5.2E-02	c*		1.1E-05	c*	
						6.0E-03	P			1	0.1		Adiponitrile	111-69-3	8.5E+06	nm	3.6E+07	nm	6.3E+00	n	2.6E+01	n						
5.6E-02	C			1.0E-02	I					1	0.1		Alachlor	15972-60-8	9.7E+00	c*	4.1E+01	c					1.1E+00	c	2.0E+00	8.7E-04	c	1.6E-03
				1.0E-03	I					1	0.1		Aldicarb	116-06-3	6.3E+01	n	8.2E+02	n					2.0E+01	n	3.0E+00	4.9E-03	n	7.5E-04
				1.0E-03	I					1	0.1		Aldicarb Sulfone	1646-88-4	6.3E+01	n	8.2E+02	n					2.0E+01	n	2.0E+00	4.4E-03	n	4.4E-04
										1	0.1		Aldicarb sulfoxide	1646-87-3											4.0E+00			8.8E-04
1.7E+01	I	4.9E-03	I	3.0E-05	I			V		1			Aldrin	309-00-2	3.9E-02	c*	1.8E-01	c	5.7E-04	c	2.5E-03	c	9.2E-04	c		1.5E-04	c	
				4.0E-03	P	1.0E-04	X	V		1		1.1E+05	Allyl Alcohol	107-18-6	3.5E+00	n	1.5E+01	n	1.0E-01	n	4.4E-01	n	2.1E-01	n		4.2E-05	n	
2.1E-02	C	6.0E-06	C			1.0E-03	I	V		1		1.4E+03	Allyl Chloride	107-05-1	7.2E-01	c**	3.2E+00	c**	4.7E-01	c**	2.0E+00	c**	7.3E-01	c**		2.3E-04	c**	
				1.0E+00	P	5.0E-03	P			1			Aluminum	7429-90-5	7.7E+04	n	1.1E+06	nm	5.2E+00	n	2.2E+01	n	2.0E+04	n		3.0E+04	n	
				4.0E-04	I					1			Aluminum Phosphide	20859-73-8	3.1E+01	n	4.7E+02	n					8.0E+00	n				
				9.0E-03	I					1	0.1		Ametryn	834-12-8	5.7E+02	n	7.4E+03	n					1.5E+02	n		1.6E-01	n	
2.1E+01	C	6.0E-03	C							1	0.1		Aminobiphenyl, 4-	92-67-1	2.6E-02	c	1.1E-01	c	4.7E-04	c	2.0E-03	c	3.0E-03	c		1.5E-05	c	
				8.0E-02	P					1	0.1		Aminophenol, m-	591-27-5	5.1E+03	n	6.6E+04	n					1.6E+03	n		6.1E-01	n	
				4.0E-03	X					1	0.1		Aminophenol, o-	95-55-6	2.5E+02	n	3.3E+03	n					7.9E+01	n		3.0E-02	n	
				2.0E-02	P					1	0.1		Aminophenol, p-	123-30-8	1.3E+03	n	1.6E+04	n					4.0E+02	n		1.5E-01	n	
				2.5E-03	I					1	0.1		Amitraz	33089-61-1	1.6E+02	n	2.1E+03	n					8.2E+00	n		4.2E+00	n	
						5.0E-01	I	V		1			Ammonia	7664-41-7					5.2E+02	n	2.2E+03	n						
				2.0E-03	X					1	0.1		Ammonium Picrate	131-74-8	1.3E+02	n	1.6E+03	n					4.0E+01	n		1.9E-01	n	
				2.0E-01	I					1			Ammonium Sulfamate	7773-06-0	1.6E+04	n	2.3E+05	nm					4.0E+03	n				
						3.0E-03	X	V		1		1.4E+04	Amyl Alcohol, tert-	75-85-4	8.2E+01	n	3.4E+02	n	3.1E+00	n	1.3E+01	n	6.3E+00	n		1.3E-03	n	
5.7E-03	I	1.6E-06	C	7.0E-03	P	1.0E-03	I			1	0.1		Aniline	62-53-3	9.5E+01	c**	4.0E+02	c*	1.0E+00	n	4.4E+00	n	1.3E+01	c*		4.6E-03	c*	
4.0E-02	P			2.0E-03	X					1	0.1		Anthraquinone, 9,10-	84-65-1	1.4E+01	c**	5.7E+01	c*					1.4E+00	c*		1.4E-02	c*	
				4.0E-04	I	3.0E-04	A			0.15			Antimony (metallic)	7440-36-0	3.1E+01	n	4.7E+02	n	3.1E-01	n	1.3E+00	n	7.8E+00	n	6.0E+00	3.5E-01	n	2.7E-01
				5.0E-04	H					0.15			Antimony Pentoxide	1314-60-9	3.9E+01	n	5.8E+02	n					9.7E+00	n				
				4.0E-04	H					0.15			Antimony Tetroxide	1332-81-6	3.1E+01	n	4.7E+02	n					7.8E+00	n				
						2.0E-04	I			0.15			Antimony Trioxide	1309-64-4	2.8E+05	nm	1.2E+06	nm	2.1E-01	n	8.8E-01	n						
1.5E+00	I	4.3E-03	I	3.0E-04	I	1.5E-05	C			1	0.03		Arsenic, Inorganic	7440-38-2	6.8E-01	c*G	3.0E+00	cG	6.5E-04	c*	2.9E-03	c*	5.2E-02	c	1.0E+01	1.5E-03	c	2.9E-01
				3.5E-06	C	5.0E-05	I			1			Arsine	7784-42-1	2.7E-01	n	4.1E+00	n	5.2E-02	n	2.2E-01	n	7.0E-02	n				
										1			Asbestos (units in fibers)	1332-21-4											7.0E+06(G)			
				3.6E-01	O					1	0.1		Asulam	3337-71-1	2.3E+04	n	3.0E+05	nm					7.2E+03	n		1.8E+00	n	
2.3E-01	C			3.0E-03	A					1	0.1		Atrazine	1912-24-9	2.4E+00	c*	1.0E+01	c					3.0E-01	c	3.0E+00	2.0E-04	c	1.9E-03
8.8E-01	C	2.5E-04	C							1	0.1		Auramine	492-80-8	6.2E-01	c	2.6E+00	c	1.1E-02	c	4.9E-02	c	7.8E-02	c		7.1E-04	c	
				4.0E-04	I					1	0.1		Avermectin B1	65195-55-3	2.5E+01	n	3.3E+02	n					8.0E+00	n		1.4E+01	n	
				3.0E-03	A	1.0E-02	A			1	0.1		Azinphos-methyl	86-50-0	1.9E+02	n	2.5E+03	n	1.0E+01	n	4.4E+01	n	5.6E+01	n		1.7E-02	n	
1.1E-01	I	3.1E-05	I					V		1			Azobenzene	103-33-3	5.6E+00	c	2.6E+01	c	9.1E-02	c	4.0E-01	c	1.2E-01	c		9.3E-04	c	
				1.0E+00	P	7.0E-06	P			1	0.1		Azodicarbonamide	123-77-3	8.6E+03	n	4.0E+04	n	7.3E-03	n	3.1E-02	n	2.0E+04	n		6.8E+00	n	
				2.0E-01	I	5.0E-04	H			0.07			Barium	7440-39-3	1.5E+04	n	2.2E+05	nm	5.2E-01	n	2.2E+00	n	3.8E+03	n	2.0E+03	1.6E+02	n	8.2E+01
				5.0E-03	O			V		1			Benfluralin	1861-40-1	3.9E+02	n	5.8E+03	n					2.8E+01	n		9.4E-01	n	
				5.0E-02	I					1	0.1		Benomyl	17804-35-2	3.2E+03	n	4.1E+04	n					9.7E+02	n		8.5E-01	n	
				2.0E-01	I					1	0.1		Bensulfuron-methyl	83055-99-6	1.3E+04	n	1.6E+05	nm					3.9E+03	n		1.0E+00	n	
				3.0E-02	I					1	0.1		Bentazon	25057-89-0	1.9E+03	n	2.5E+04	n					5.7E+02	n		1.2E-01	n	
4.0E-03	P			1.0E-01	I			V		1		1.2E+03	Benzaldehyde	100-52-7	1.7E+02	c*	8.2E+02	c					1.9E+01	c		4.1E-03	c	
5.5E-02	I	7.8E-06	I	4.0E-03	I	3.0E-02	I	V		1		1.8E+03	Benzene	71-43-2	1.2E+00	c*	5.1E+00	c*	3.6E-01	c*	1.6E+00	c*	4.6E-01	c*	5.0E+00	2.3E-04	c*	2.6E-03
1.0E-01	X			3.0E-04	X					1	0.1		Benzenediamine-2-methyl sulfate, 1,4-	6369-59-1	5.4E+00	c**	2.3E+01	c*					7.8E-01	c**		2.2E-04	c**	
				1.0E-03	P			V		1		1.3E+03	Benzenethiol	108-98-5	7.8E+01	n	1.2E+03	n					1.7E+01	n		1.1E-02	n	
2.3E+02	I	6.7E-02	I	3.0E-03	I				M	1	0.1		Benzidine	92-87-5	5.3E-04	c	1.0E-02	c	1.5E-05	c	1.8E-04	c	1.1E-04	c		2.8E-07	c	
				4.0E+00	I					1	0.1		Benzoic Acid	65-85-0	2.5E+05	nm	3.3E+06	nm					7.5E+04	n		1.5E+01	n	
1.3E+01	I							V		1		3.2E+02	Benzotrichloride	98-07-7	5.3E-02	c	2.5E-01	c					3.0E-03	c		6.6E-06	c	
				1.0E-01	P					1	0.1		Benzyl Alcohol	100-51-6	6.3E+03	n	8.2E+04	n					2.0E+03	n		4.8E-01	n	
1.7E-01	I	4.9E-05	C	2.0E-03	P	1.0E-03	P	V		1		1.5E+03	Benzyl Chloride	100-44-7	1.1E+00	c*	4.8E+00	c*	5.7E-02	c*	2.5E-01	c*	8.9E-02	c*		9.8E-05	c*	
		2.4E-03	I	2.0E-03	I	2.0E-05	I			0.007			Beryllium and compounds	7440-41-7	1.6E+02	n	2.3E+03	n	1.2E-03	c*	5.1E-03	c*	2.5E+01	n	4.0E+00	1.9E+01	n	3.2E+00
				9.0E-03	P					1	0.1		Bifenox	42576-02-3	5.7E+02	n	7.4E+03	n					1.0E+02	n		7.6E-01	n	
				1.5E-02	I					1	0.1		Biphenthrin	82657-04-3	9.5E+02	n	1.2E+04	n					3.0E+02	n		1.4E+03	n	
8.0E-03	I			5.0E-01	I	4.0E-04	X	V		1			Biphenyl, 1,1'-	92-52-4	4.7E+01	n	2.0E+02	n	4.2E-01	n	1.8E+00	n	8.3E-01	n		8.7E-03	n	
				4.0E-02	I			V		1		1.0E+03	Bis(2-chloro-1-methylethyl) ether	108-60-1	3.1E+03	ns	4.7E+04	ns					7.1E+02	n		2.6E-01	n	
				3.0E-03	P					1	0.1		Bis(2-chloroethoxy)methane	111-91-1	1.9E+02	n	2.5E+03	n					5.9E+01	n		1.3E-02	n	
1.1E+00	I	3.3E-04	I					V		1		5.1E+03	Bis(2-chloroethyl)ether	111-44-4	2.3E-01	c	1.0E+00	c	8.5E-03	c	3.7E-02	c	1.4E-02	c		3.6E-06	c	
2.2E+02	I	6.2E-02	I					V		1		4.2E+03	Bis(chloromethyl)ether	542-88-1	8.3E-05	c	3.6E-04	c	4.5E-05	c	2.0E-04	c	7.2E-05	c		1.7E-08	c	
				5.0E-02	I					1	0.1		Bisphenol A	80-05-7	3.2E+03	n	4.1E+04	n					7.7E+02	n		5.8E+01	n	
				2.0E-01	I	2.0E-02	H			1			Boron And Borates Only	7440-42-8	1.6E+04	n	2.3E+05	nm	2.1E+01	n	8.8E+01	n	4.0E+03	n		1.3E+01	n	
				2.0E+00	P	2.0E-02	P	V		1			Boron Trichloride	10294-34-5	1.6E+05	nm	2.3E+06	nm	2.1E+01	n	8.8E+01	n	4.2E+01	n				
				4.0E-02	C	1.3E-02	C	V		1			Boron Trifluoride	7637-07-2	3.1E+03	n	4.7E+04	n	1.4E+01	n	5.7E+01	n	2.6E+01	n				
7.0E-01	I	1.4E-04	C	4.0E-03	I					1			Bromate	15541-45-4	9.9E-01	c	4.7E+00	c	2.0E-02	c	8.8E-02	c	1.1E-01	c	1.0E+01	8.5E-04	c	7.7E-02
				1.0E-04	X	6.0E-05	X	V		1		2.4E+03	Bromo-2-chloroethane, 1-	107-04-0	3.5E-01	n	1.5E+00	n	6.3E-02	n	2.6E-01	n	1.2E-01	n		3.3E-05	n	
				3.0E-04	X			V		1		9.0E+02	Bromo-3-fluorobenzene, 1-	1073-06-9	2.3E+01	n	3.5E+02	n					4.9E+00	n		4.7E-03	n	
				3.0E-04	X			V		1		3.2E+02	Bromo-4-fluorobenzene, 1-	460-00-4	2.3E+01	n	3.5E+02	ns					4.6E+00	n		4.4E-03	n	
				1.7E-03	C					1	0.1		Bromoacetic acid	79-08-3	1.1E+02	n	1.4E+03	n					3.4E+01	n	6.0E+01(G)	6.9E-03	n	1.2E-02
				8.0E-03	I	6.0E-02	I	V		1		6.8E+02	Bromobenzene	108-86-1	2.9E+02	n	1.8E+03	ns	6.3E+01	n	2.6E+02	n	6.2E+01	n		4.2E-02	n	

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Toxicity and Chemical-specific Information														Contaminant		Screening Levels										Protection of Groundwater SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tap Water (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
						4.0E-02	X	V		1		4.0E+03	Bromochloromethane	74-97-5	1.5E+02	n	6.3E+02	n	4.2E+01	n	1.8E+02	n	8.3E+01	n		2.1E-02	n	
6.2E-02	I	3.7E-05	C	8.0E-03	P			V		1		9.3E+02	Bromodichloromethane	75-27-4	2.9E-01	c	1.3E+00	c	7.6E-02	c	3.3E-01	c	1.3E-01	c	8.0E+01(G)	3.6E-05	c	2.2E-02
7.9E-03	I	1.1E-06	I	2.0E-02	I			V		1		9.2E+02	Bromoform	75-25-2	1.9E+01	c*	8.6E+01	c	2.6E+00	c	1.1E+01	c	3.3E+00	c	8.0E+01(G)	8.7E-04	c	2.1E-02
				1.4E-03	I	5.0E-03	I	V		1		3.6E+03	Bromomethane	74-83-9	6.8E+00	n	3.0E+01	n	5.2E+00	n	2.2E+01	n	7.5E+00	n		1.9E-03	n	
				5.0E-03	H			V		1			Bromophos	2104-96-3	3.9E+02	n	5.8E+03	n					3.5E+01	n		1.5E-01	n	
		3.7E-06	C			1.0E-01	A	V		1		9.7E+02	Bromopropane, 1-	106-94-5	1.6E+00	c	7.1E+00	c	7.6E-01	c	3.3E+00	c	1.5E+00	c		4.6E-04	c	
1.0E-01	O			1.5E-02	O					1	0.1		Bromoxynil	1689-84-5	5.3E+00	c	2.2E+01	c					6.1E-01	c		5.2E-04	c	
1.0E-01	O			1.5E-02	O			V		1			Bromoxynil Octanoate	1689-99-2	6.7E+00	c	3.2E+01	c					2.4E-01	c		2.1E-03	c	
6.0E-01	C	3.0E-05	I			2.0E-03	I	V		1		6.7E+02	Butadiene, 1,3-	106-99-0	7.6E-02	c*	3.3E-01	c*	9.4E-02	c*	4.1E-01	c*	7.1E-02	c*		3.9E-05	c*	
				1.0E-01	I			V		1		7.6E+03	Butanol, N-	71-36-3	7.8E+03	ns	1.2E+05	nms					2.0E+03	n		4.1E-01	n	
5.0E-04	I			4.0E-01	I	5.0E+00	I	V		1			Butyl Alcohol, t-	75-65-0	1.4E+03	c*	6.5E+03	c*	5.2E+03	n	2.2E+04	n	1.5E+02	c*		3.2E-02	c*	
				2.0E+00	P	3.0E+01	P	V		1		2.1E+04	Butyl alcohol, sec-	78-92-2	1.3E+05	nms	1.5E+06	nms	3.1E+04	n	1.3E+05	n	2.4E+04	n		5.0E+00	n	
				5.0E-02	I			V		1			Butylate	2008-41-5	3.9E+03	n	5.8E+04	n					4.6E+02	n		4.5E-01	n	
2.0E-04	C	5.7E-08	C							1	0.1		Butylated hydroxyanisole	25013-16-5	2.7E+03	c	1.1E+04	c	4.9E+01	c	2.2E+02	c	1.5E+02	c		2.9E-01	c	
3.6E-03	P			3.0E-01	P					1	0.1		Butylated hydroxytoluene	128-37-0	1.5E+02	c	6.4E+02	c					3.4E+00	c		1.0E-01	c	
				5.0E-02	P			V		1		1.1E+02	Butylbenzene, n-	104-51-8	3.9E+03	ns	5.8E+04	ns					1.0E+03	n		3.2E+00	n	
				1.0E-01	X			V		1		1.5E+02	Butylbenzene, sec-	135-98-8	7.8E+03	ns	1.2E+05	nms					2.0E+03	n		5.9E+00	n	
				1.0E-01	X			V		1		1.8E+02	Butylbenzene, tert-	98-06-6	7.8E+03	ns	1.2E+05	nms					6.9E+02	n		1.6E+00	n	
				2.0E-02	A					1	0.1		Cacodylic Acid	75-60-5	1.3E+03	n	1.6E+04	n					4.0E+02	n		1.1E-01	n	
		1.8E-03	I	1.0E-04	A	1.0E-05	A			0.025	0.001		Cadmium (Diet)	7440-43-9	7.1E+00	n	1.0E+02	n	1.6E-03	c**	6.8E-03	c**						
		1.8E-03	I	1.0E-04	A	1.0E-05	A			0.05	0.001		Cadmium (Water)	7440-43-9					1.6E-03	c**	6.8E-03	c**	1.8E+00	n	5.0E+00	1.4E-01	n	3.8E-01
				5.0E-01	I	2.2E-03	C			1	0.1		Caprolactam	105-60-2	3.1E+04	n	4.0E+05	nm	2.3E+00	n	9.6E+00	n	9.9E+03	n		2.5E+00	n	
1.5E-01	C	4.3E-05	C	2.0E-03	I					1	0.1		Captafol	2425-06-1	3.6E+00	c*	1.5E+01	c	6.5E-02	c	2.9E-01	c	4.0E-01	c*		7.1E-04	c*	
2.3E-03	C	6.6E-07	C	1.3E-01	I					1	0.1		Captan	133-06-2	2.4E+02	c*	1.0E+03	c	4.3E+00	c	1.9E+01	c	3.1E+01	c*		2.2E-02	c*	
				1.0E-01	I					1	0.1		Carbaryl	63-25-2	6.3E+03	n	8.2E+04	n					1.8E+03	n		1.7E+00	n	
				5.0E-03	I					1	0.1		Carbofuran	1563-66-2	3.2E+02	n	4.1E+03	n					9.4E+01	n	4.0E+01	3.7E-02	n	1.6E-02
				1.0E-01	I	7.0E-01	I	V		1		7.4E+02	Carbon Disulfide	75-15-0	7.7E+02	ns	3.5E+03	ns	7.3E+02	n	3.1E+03	n	8.1E+02	n		2.4E-01	n	
7.0E-02	I	6.0E-06	I	4.0E-03	I	1.0E-01	I	V		1		4.6E+02	Carbon Tetrachloride	56-23-5	6.5E-01	c	2.9E+00	c	4.7E-01	c	2.0E+00	c	4.6E-01	c	5.0E+00	1.8E-04	c	1.9E-03
						1.0E-01	P	V		1		5.9E+03	Carbonyl Sulfide	463-58-1	6.7E+01	n	2.8E+02	n	1.0E+02	n	4.4E+02	n	2.1E+02	n		5.1E-01	n	
				1.0E-02	I					1	0.1		Carbosulfan	55285-14-8	6.3E+02	n	8.2E+03	n					5.1E+01	n		1.2E+00	n	
				1.0E-01	I					1	0.1		Carboxin	5234-68-4	6.3E+03	n	8.2E+04	n					1.9E+03	n		1.0E+00	n	
						9.0E-04	I			1			Ceric oxide	1306-38-3	1.3E+06	nm	5.4E+06	nm	9.4E-01	n	3.9E+00	n						
				1.0E-01	I			V		1			Chloral Hydrate	302-17-0	7.8E+03	n	1.2E+05	nm					2.0E+03	n		4.0E-01	n	
				1.5E-02	I					1	0.1		Chloramben	133-90-4	9.5E+02	n	1.2E+04	n					2.9E+02	n		7.0E-02	n	
										1	0.1		Chloramines, Organic	E701235											4.0E+03(G)			
4.0E-01	H									1	0.1		Chloranil	118-75-2	1.3E+00	c	5.7E+00	c					1.8E-01	c		1.5E-04	c	
				5.0E-04	G			V		1	0.04		Chlordane (alpha)	5103-71-9	3.6E+01	n	5.0E+02	n					3.6E+00	n		4.9E-01	n	
				5.0E-04	G			V		1	0.04		Chlordane (gamma)	5103-74-2	3.6E+01	n	5.0E+02	n					1.0E+01	n		1.4E+00	n	
3.5E-01	I	1.0E-04	I	5.0E-04	I	7.0E-04	I	V		1	0.04		Chlordane (technical mixture)	12789-03-6	1.7E+00	c*	7.7E+00	c*	2.8E-02	c*	1.2E-01	c*	2.0E-02	c*	2.0E+00	2.7E-03	c*	2.7E-01
1.0E+01	I	4.6E-03	C	3.0E-04	I					1	0.1		Chlordecone (Kepone)	143-50-0	5.4E-02	c	2.3E-01	c	6.1E-04	c	2.7E-03	c	3.5E-03	c		1.2E-04	c	
				7.0E-04	A					1	0.1		Chlorfenvinphos	470-90-6	4.4E+01	n	5.7E+02	n					1.1E+01	n		3.1E-02	n	
				9.0E-02	O					1	0.1		Chlorimuron, Ethyl-	90982-32-4	5.7E+03	n	7.4E+04	n					1.8E+03	n		6.0E-01	n	
				1.0E-01	I	1.5E-04	A	V		1		2.8E+03	Chlorine	7782-50-5	1.8E-01	n	7.8E-01	n	1.5E-01	n	6.4E-01	n	3.0E-01	n	4.0E+03(G)	1.5E-04	n	2.0E+00
				3.0E-02	I	2.0E-04	I	V		1			Chlorine Dioxide	10049-04-4	2.3E+03	n	3.4E+04	n	2.1E-01	n	8.8E-01	n	4.2E-01	n	8.0E+02(G)			
				3.0E-02	I					1			Chlorite (Sodium Salt)	7758-19-2	2.3E+03	n	3.5E+04	n					6.0E+02	n	1.0E+03			
						5.0E+01	I	V		1		1.2E+03	Chloro-1,1-difluoroethane, 1-	75-68-3	5.4E+04	ns	2.3E+05	nms	5.2E+04	n	2.2E+05	n	1.0E+05	n		5.2E+01	n	
		3.0E-04	I	2.0E-02	H	2.0E-02	I	V		1		7.9E+02	Chloro-1,3-butadiene, 2- (Chloroprene)	126-99-8	1.0E-02	c	4.4E-02	c	9.4E-03	c	4.1E-02	c	1.9E-02	c		9.8E-06	c	
4.6E-01	H									1	0.1		Chloro-2-methylaniline HCl, 4-	3165-93-3	1.2E+00	c	5.0E+00	c					1.7E-01	c		1.5E-04	c	
1.0E-01	P	7.7E-05	C	3.0E-03	X					1	0.1		Chloro-2-methylaniline, 4-	95-69-2	5.4E+00	c*	2.3E+01	c	3.6E-02	c	1.6E-01	c	7.0E-01	c*		4.0E-04	c*	
2.7E-01	X							V		1		1.2E+04	Chloroacetaldehyde, 2-	107-20-0	2.6E+00	c	1.2E+01	c					2.9E-01	c		5.8E-05	c	
				3.5E-03	C					1	0.1		Chloroacetic Acid	79-11-8	2.2E+02	n	2.9E+03	n					7.0E+01	n	6.0E+01(G)	1.4E-02	n	1.2E-02
						3.0E-05	I			1	0.1		Chloroacetophenone, 2-	532-27-4	4.3E+04	n	1.8E+05	nm	3.1E-02	n	1.3E-01	n						
2.0E-01	P			5.0E-04	P					1	0.1		Chloroaniline, p-	106-47-8	2.7E+00	c*	1.1E+01	c*					3.7E-01	c*		1.6E-04	c*	
				2.0E-02	I	5.0E-02	P	V		1		7.6E+02	Chlorobenzene	108-90-7	2.8E+02	n	1.3E+03	ns	5.2E+01	n	2.2E+02	n	7.8E+01	n	1.0E+02	5.3E-02	n	6.8E-02
				1.0E-01	X					1	0.1		Chlorobenzene sulfonic acid, p-	98-66-8	6.3E+03	n	8.2E+04	n					2.0E+03	n		4.7E-01	n	
1.1E-01	C	3.1E-05	C	2.0E-02	I					1	0.1		Chlorobenzilate	510-15-6	4.9E+00	c	2.1E+01	c	9.1E-02	c	4.0E-01	c	3.1E-01	c		1.0E-03	c	
				3.0E-02	X					1	0.1		Chlorobenzoic Acid, p-	74-11-3	1.9E+03	n	2.5E+04	n					5.1E+02	n		1.3E-01	n	
		8.6E-06	C	3.0E-03	P	3.0E-01	P	V		1		2.9E+02	Chlorobenzotrifluoride, 4-	98-56-6	2.2E+00	c*	9.6E+00	c	3.3E-01	c	1.4E+00	c	6.5E-01	c*		2.3E-03	c*	
				4.0E-02	P			V		1		7.3E+02	Chlorobutane, 1-	109-69-3	3.1E+03	ns	4.7E+04	ns					6.4E+02	n		2.6E-01	n	
						5.0E+01	I	V		1		1.7E+03	Chlorodifluoromethane	75-45-6	4.9E+04	ns	2.1E+05	nms	5.2E+04	n	2.2E+05	n	1.0E+05	n		4.3E+01	n	
				2.0E-02	P			V		1		1.1E+05	Chloroethanol, 2-	107-07-3	1.6E+03	n	2.3E+04	n					4.0E+02	n		8.1E-02	n	
3.1E-02	C	2.3E-05	I	1.0E-02	I	9.8E-02	A	V		1		2.5E+03	Chloroform	67-66-3	3.2E-01	c	1.4E+00	c	1.2E-01	c	5.3E-01	c	2.2E-01	c	8.0E+01(G)	6.1E-05	c	2.2E-02
						9.0E-02	I	V		1		1.3E+03	Chloromethane	74-87-3	1.1E+02	n	4.6E+02	n	9.4E+01	n	3.9E+02	n	1.9E+02	n		4.9E-02	n	
2.4E+00	C	6.9E-04	C					V		1		9.3E+03	Chloromethyl Methyl Ether	107-30-2	2.0E-02	c	8.9E-02	c	4.1E-03	c	1.8E-02	c	6.5E-03	c		1.4E-06	c	
3.0E-01	P			3.0E-03	P	1.0E-05	X			1	0.1		Chloronitrobenzene, o-	88-73-3	1.8E+00	c	7.7E+00	c	1.0E-02	n	4.4E-02	n	2.4E-01	c		2.2E-04	c	
6.0E-02	P			7.0E-04	P	2.0E-03	P			1	0.1		Chloronitrobenzene, p-	100-00-5	9.0E+00	c**	3.8E+01	c*	2.1E+00	n	8.8E+00	n	1.2E+00	c*		1.1E-03	c*	
				5.0E-03	I			V		1		2.7E+04	Chlorophenol, 2-	95-57-8	3.9E+02	n	5.8E+03	n					9.1E+01	n		8.9E-02	n	
						4.0E-04	C	V		1		6.2E+02	Chloropicrin	76-06-2	2.0E+00	n	8.2E+00	n	4.2E-01	n	1.8E+00	n	8.3E-01	n		2.5E-04	n	
1.7E-02	C			1.5E-02	I					1	0.1		Chlorothalonil	1897-45-6	3.2E+01	c*	1.4E+02	c*					4.0E+00	c*		9.0E-03	c*	
				2.0E-02	I			V		1		9.1E+02	Chlorotoluene, o-	95-49-8	1.6E+03	ns	2.3E+04	ns					2.4E+02	n		2.3E-01	n	
				2.0E-02	X			V		1		2.5E+02	Chlorotoluene, p-	106-43-4	1.6E+03	ns	2.3E+04	ns					2.5E+02	n		2.4E-01	n	
2.4E+02	C	6.9E-02	C							1	0.1		Chlorozotocin	54749-90-5	2.3E-03	c	9.6E-03	c	4.1E-05	c	1.8E-04	c	3.2E-04	c		7.1E-08	c	
				5.0E-03	O					1	0.1		Chlorpropham	101-21-3	3.2E+02	n	4.1E+03	n					7.1E+01	n		6.4E-02	n	
				1.0E-03	A					1	0.1		Chlorpyrifos	2921-88-2	6.3E+01	n	8.2E+02	n					8.4E+00	n		1.2E-01	n	
				1.0E-02	H					1	0.1		Chlorpyrifos Methyl	5598-13-0	6.3E+02	n	8.2E+03	n					1.2E+02	n		5.4E-01	n	
				5.0E-02	O					1	0.1		Chlorsulfuron	64902-72-3	3.2E+03	n	4.1E+04	n					9.9E+02	n		8.3E-01	n	
				1.0E-02	I					1	0.1		Chlorthal-dimethyl	1861-32-1	6.3E+02	n	8.2E+03	n					1.2E+02	n		1.5E-01	n	
				8.0E-04	H					1	0.1		Chlorthiophos	60238-56-4	5.1E+01	n	6.6E+02	n					2.8E+00	n		7.3E-02	n	
						6.0E-05	C			1			Chromium(III) (Soluble Compounds)	16065-83-1	8.5E+04	n	3.6E+05	nm	6.3E-02	n	2.6E-01	n						
				1.5E+00	I					0.013			Chromium(III), Insoluble Salts	16065-83-1	1.2E+05	nm	1.8E+06	nm					2.2E+04	n		4.0E+07	n	

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = OW; R = ORD; N = WI; W = TEF applied; E = RPF applied; G = see user's guide; c = cancer; n = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded; V = volatile; M = mutagen.

Toxicity and Chemical-specific Information														Contaminant		Screening Levels										Protection of Groundwater SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tap Water (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
5.0E-01	C	8.4E-02	G	3.0E-03	I	1.0E-04	I		M	0.025			Chromium(VI)	18540-29-9	3.0E-01	c	6.3E+00	c	1.2E-05	c	1.5E-04	c	3.5E-02	c		6.7E-04	c	
										0.013			Chromium, Total	7440-47-3											1.0E+02			1.8E+05
				1.3E-02	I					1	0.1		Clofentezine	74115-24-5	8.2E+02	n	1.1E+04	n					2.3E+02	n		1.4E+01	n	
		9.0E-03	P	3.0E-04	P	6.0E-06	P			1			Cobalt	7440-48-4	2.3E+01	n	3.5E+02	n	3.1E-04	c*	1.4E-03	c*	6.0E+00	n		2.7E-01	n	
		6.2E-04	I					V	M	1			Coke Oven Emissions	E649830					1.6E-03	c	2.0E-02	c						
				4.0E-02	H					1			Copper	7440-50-8	3.1E+03	n	4.7E+04	n					8.0E+02	n	1.3E+03	2.8E+01	n	4.6E+01
				5.0E-02	I	6.0E-01	C			1	0.1		Cresol, m-	108-39-4	3.2E+03	n	4.1E+04	n	6.3E+02	n	2.6E+03	n	9.3E+02	n		7.4E-01	n	
				5.0E-02	I	6.0E-01	C			1	0.1		Cresol, o-	95-48-7	3.2E+03	n	4.1E+04	n	6.3E+02	n	2.6E+03	n	9.3E+02	n		7.5E-01	n	
				2.0E-02	P	6.0E-01	C			1	0.1		Cresol, p-	106-44-5	1.3E+03	n	1.6E+04	n	6.3E+02	n	2.6E+03	n	3.7E+02	n		3.0E-01	n	
				1.0E-01	A					1	0.1		Cresol, p-chloro-m-	59-50-7	6.3E+03	n	8.2E+04	n					1.4E+03	n		1.7E+00	n	
				1.0E-01	A	6.0E-01	C			1	0.1		Cresols	1319-77-3	6.3E+03	n	8.2E+04	n	6.3E+02	n	2.6E+03	n	1.5E+03	n		1.3E+00	n	
1.9E+00	H			1.0E-03	P			V		1		1.7E+04	Crotonaldehyde, trans-	123-73-9	3.7E-01	c	1.7E+00	c					4.0E-02	c		8.2E-06	c	
				1.0E-01	I	4.0E-01	I	V		1		2.7E+02	Cumene	98-82-8	1.9E+03	ns	9.9E+03	ns	4.2E+02	n	1.8E+03	n	4.5E+02	n		7.4E-01	n	
2.2E-01	C	6.3E-05	C							1	0.1		Cupferron	135-20-6	2.5E+00	c	1.0E+01	c	4.5E-02	c	1.9E-01	c	3.5E-01	c		6.1E-04	c	
8.4E-01	H			2.0E-03	H					1	0.1		Cyanazine	21725-46-2	6.5E-01	c	2.7E+00	c					8.8E-02	c		4.1E-05	c	
													Cyanides															
				1.0E-03	I	9.0E-03	C			1			~Calcium Cyanide	592-01-8	7.8E+01	n	1.2E+03	n	9.4E+00	n	3.9E+01	n	2.0E+01	n				
				5.0E-03	I					1			~Copper Cyanide	544-92-3	3.9E+02	n	5.8E+03	n					1.0E+02	n				
				6.0E-04	I	8.0E-04	G	V		1		9.5E+05	~Cyanide (CN-)	57-12-5	2.3E+01	n	1.5E+02	n	8.3E-01	n	3.5E+00	n	1.5E+00	n	2.0E+02	1.5E-02	n	2.0E+00
				1.0E-03	I			V		1			~Cyanogen	460-19-5	7.8E+01	n	1.2E+03	n					2.0E+01	n				
				9.0E-02	I			V		1			~Cyanogen Bromide	506-68-3	7.0E+03	n	1.1E+05	nm					1.8E+03	n				
				5.0E-02	I			V		1			~Cyanogen Chloride	506-77-4	3.9E+03	n	5.8E+04	n					1.0E+03	n				
				6.0E-04	I	8.0E-04	I	V		1		1.0E+07	~Hydrogen Cyanide	74-90-8	2.3E+01	n	1.5E+02	n	8.3E-01	n	3.5E+00	n	1.5E+00	n		1.5E-02	n	
				2.0E-03	I	9.0E-03	C			1			~Potassium Cyanide	151-50-8	1.6E+02	n	2.3E+03	n	9.4E+00	n	3.9E+01	n	4.0E+01	n				
				5.0E-03	I					0.04			~Potassium Silver Cyanide	506-61-6	3.9E+02	n	5.8E+03	n					8.2E+01	n				
				1.0E-01	I					0.04			~Silver Cyanide	506-64-9	7.8E+03	n	1.2E+05	nm					1.8E+03	n				
				1.0E-03	I	9.0E-03	C			1			~Sodium Cyanide	143-33-9	7.8E+01	n	1.2E+03	n	9.4E+00	n	3.9E+01	n	2.0E+01	n	2.0E+02			
				2.0E-04	P					1			~Thiocyanates	E1790665	1.6E+01	n	2.3E+02	n					4.0E+00	n				
				2.0E-04	X			V		1			~Thiocyanic Acid	463-56-9	1.6E+01	n	2.3E+02	n					4.0E+00	n				
				5.0E-02	I					1			~Zinc Cyanide	557-21-1	3.9E+03	n	5.8E+04	n					1.0E+03	n				
						6.0E+00	I	V		1		1.2E+02	Cyclohexane	110-82-7	6.5E+03	ns	2.7E+04	ns	6.3E+03	n	2.6E+04	n	1.3E+04	n		1.3E+01	n	
2.0E-02	X			2.0E-02	X					1	0.1		Cyclohexane, 1,2,3,4,5-pentabromo-6-chloro-	87-84-3	2.7E+01	c*	1.1E+02	c					2.8E+00	c		1.6E-02	c	
				5.0E+00	I	7.0E-01	P	V		1		5.1E+03	Cyclohexanone	108-94-1	2.8E+04	ns	1.3E+05	nms	7.3E+02	n	3.1E+03	n	1.4E+03	n		3.4E-01	n	
				5.0E-03	P	1.0E+00	X	V		1		2.8E+02	Cyclohexene	110-83-8	3.1E+02	ns	3.1E+03	ns	1.0E+03	n	4.4E+03	n	7.0E+01	n		4.6E-02	n	
				2.0E-01	I			V		1		2.9E+05	Cyclohexylamine	108-91-8	1.6E+04	n	2.3E+05	nm					3.8E+03	n		1.0E+00	n	
				2.5E-02	I					1	0.1		Cyfluthrin	68359-37-5	1.6E+03	n	2.1E+04	n					1.2E+02	n		3.1E+01	n	
				5.0E-01	O					1	0.1		Cyromazine	66215-27-8	3.2E+04	n	4.1E+05	nm					9.9E+03	n		2.5E+00	n	
				3.0E-02	I					1	0.1		Dalapon	75-99-0	1.9E+03	n	2.5E+04	n					6.0E+02	n	2.0E+02	1.2E-01	n	4.1E-02
1.8E-02	C	5.1E-06	C	1.5E-01	I					1	0.1		Daminozide	1596-84-5	3.0E+01	c	1.3E+02	c	5.5E-01	c	2.4E+00	c	4.3E+00	c		9.5E-04	c	
7.0E-04	I			7.0E-03	I					1	0.1		Decabromodiphenyl ether, 2,2',3,3',4,4',5,5',6,6'- (BDE-209)	1163-19-5	4.4E+02	n	3.3E+03	c**					1.1E+02	c**		6.2E+01	c**	
				4.0E-05	I					1	0.1		Demeton	8065-48-3	2.5E+00	n	3.3E+01	n					4.2E-01	n				
1.2E-03	I			6.0E-01	I					1	0.1		Di(2-ethylhexyl)adipate	103-23-1	4.5E+02	c*	1.9E+03	c					6.5E+01	c	4.0E+02	4.7E+00	c	2.9E+01
6.1E-02	H									1	0.1		Diallate	2303-16-4	8.9E+00	c	3.8E+01	c					5.4E-01	c		8.0E-04	c	
				7.0E-04	A					1	0.1		Diazinon	333-41-5	4.4E+01	n	5.7E+02	n					1.0E+01	n		6.5E-02	n	
8.0E-01	P	6.0E-03	P	2.0E-04	P	2.0E-04	I	V	M	1		9.8E+02	Dibromo-3-chloropropane, 1,2-	96-12-8	5.3E-03	c	6.4E-02	c	1.7E-04	c	2.0E-03	c	3.3E-04	c	2.0E-01	1.4E-07	c	8.6E-05
2.5E-01	C			3.0E-04	C					1	0.1		Dibromoacetic acid	631-64-1	2.2E+00	c**	9.2E+00	c*					3.1E-01	c*	6.0E+01(G)	6.3E-05	c*	1.2E-02
				4.0E-04	X			V		1		1.6E+02	Dibromobenzene, 1,3-	108-36-1	3.1E+01	n	4.7E+02	ns					5.3E+00	n		5.1E-03	n	
				1.0E-02	I			V		1			Dibromobenzene, 1,4-	106-37-6	7.8E+02	n	1.2E+04	n					1.3E+02	n		1.2E-01	n	
8.4E-02	I			2.0E-02	I			V		1		8.0E+02	Dibromochloromethane	124-48-1	8.3E+00	c	3.9E+01	c					8.7E-01	c	8.0E+01(G)	2.3E-04	c	2.1E-02
2.0E+00	I	6.0E-04	I	9.0E-03	I	9.0E-03	I	V		1		1.3E+03	Dibromoethane, 1,2-	106-93-4	3.6E-02	c	1.6E-01	c	4.7E-03	c	2.0E-02	c	7.5E-03	c	5.0E-02	2.1E-06	c	1.4E-05
						4.0E-03	X	V		1		2.8E+03	Dibromomethane (Methylene Bromide)	74-95-3	2.4E+01	n	9.9E+01	n	4.2E+00	n	1.8E+01	n	8.3E+00	n		2.1E-03	n	
				3.0E-04	P					1	0.1		Dibutyltin Compounds	E1790661	1.9E+01	n	2.5E+02	n					6.0E+00	n				
				3.0E-02	I					1	0.1		Dicamba	1918-00-9	1.9E+03	n	2.5E+04	n					5.7E+02	n		1.5E-01	n	
										1	0.1		Dichloramine	3400-09-7											4.0E+03(G)			
		4.2E-03	P					V		1		5.5E+02	Dichloro-2-butene, 1,4-	764-41-0	2.1E-03	c	9.4E-03	c	6.7E-04	c	2.9E-03	c	1.3E-03	c		6.6E-07	c	
		4.2E-03	P					V		1		5.2E+02	Dichloro-2-butene, cis-1,4-	1476-11-5	7.4E-03	c	3.2E-02	c	6.7E-04	c	2.9E-03	c	1.3E-03	c		6.2E-07	c	
		4.2E-03	P					V		1		7.6E+02	Dichloro-2-butene, trans-1,4-	110-57-6	7.4E-03	c	3.2E-02	c	6.7E-04	c	2.9E-03	c	1.3E-03	c		6.2E-07	c	
5.0E-02	I			4.0E-03	I					1	0.1		Dichloroacetic Acid	79-43-6	1.1E+01	c*	4.6E+01	c*					1.5E+00	c*	6.0E+01(G)	3.1E-04	c*	1.2E-02
				9.0E-02	I	2.0E-01	H	V		1		3.8E+02	Dichlorobenzene, 1,2-	95-50-1	1.8E+03	ns	9.3E+03	ns	2.1E+02	n	8.8E+02	n	3.0E+02	n	6.0E+02	3.0E-01	n	5.8E-01
5.4E-03	C	1.1E-05	C	7.0E-02	A	8.0E-01	I	V		1			Dichlorobenzene, 1,4-	106-46-7	2.6E+00	c	1.1E+01	c	2.6E-01	c	1.1E+00	c	4.8E-01	c	7.5E+01	4.6E-04	c	7.2E-02
4.5E-01	I	3.4E-04	C							1	0.1		Dichlorobenzidine, 3,3'-	91-94-1	1.2E+00	c	5.1E+00	c	8.3E-03	c	3.6E-02	c	1.3E-01	c		8.2E-04	c	
				9.0E-03	X					1	0.1		Dichlorobenzophenone, 4,4'-	90-98-2	5.7E+02	n	7.4E+03	n					7.8E+01	n		4.7E-01	n	
				2.0E-01	I	1.0E-01	X	V		1		8.5E+02	Dichlorodifluoromethane	75-71-8	8.7E+01	n	3.7E+02	n	1.0E+02	n	4.4E+02	n	2.0E+02	n		3.0E-01	n	
2.4E-01	I	6.9E-05	C	5.0E-04	A					1	0.1		Dichlorodiphenyldichloroethane, p,p`- (DDD)	72-54-8	2.3E+00	c*	9.6E+00	c*	4.1E-02	c	1.8E-01	c	3.2E-02	c*		7.5E-03	c*	
3.4E-01	I	9.7E-05	C	5.0E-04	A			V		1			Dichlorodiphenyldichloroethylene, p,p`- (DDE)	72-55-9	2.0E+00	c*	9.3E+00	c*	2.9E-02	c	1.3E-01	c	4.6E-02	c		1.1E-02	c	
3.4E-01	I	9.7E-05	I	5.0E-04	I					1	0.03		Dichlorodiphenyltrichloroethane, p,p`- (DDT)	50-29-3	1.9E+00	c*	8.5E+00	c*	2.9E-02	c	1.3E-01	c	2.3E-01	c*		7.7E-02	c*	
5.7E-03	C	1.6E-06	C	2.0E-01	P			V		1		1.7E+03	Dichloroethane, 1,1-	75-34-3	3.6E+00	c	1.6E+01	c	1.8E+00	c	7.7E+00	c	2.8E+00	c		7.8E-04	c	
9.1E-02	I	2.6E-05	I	6.0E-03	X	7.0E-03	P	V		1		3.0E+03	Dichloroethane, 1,2-	107-06-2	4.6E-01	c*	2.0E+00	c*	1.1E-01	c*	4.7E-01	c*	1.7E-01	c*	5.0E+00	4.8E-05	c*	1.4E-03
				5.0E-02	I	2.0E-01	I	V		1		1.2E+03	Dichloroethylene, 1,1-	75-35-4	2.3E+02	n	1.0E+03	n	2.1E+02	n	8.8E+02	n	2.8E+02	n	7.0E+00	1.0E-01	n	2.5E-03
				2.0E-03	I	4.0E-02	X	V		1		2.4E+03	Dichloroethylene, cis-1,2-	156-59-2	6.3E+01	n	3.7E+02	n	4.2E+01	n	1.8E+02	n	2.5E+01	n	7.0E+01	7.4E-03	n	2.1E-02
				2.0E-02	I	4.0E-02	X	V		1		1.9E+03	Dichloroethylene, trans-1,2-	156-60-5	7.0E+01	n	3.0E+02	n	4.2E+01	n	1.8E+02	n	6.8E+01	n	1.0E+02	2.1E-02	n	3.1E-02
				3.0E-03	I					1	0.1		Dichlorophenol, 2,4-	120-83-2	1.9E+02	n	2.5E+03	n					4.6E+01	n		2.3E-02	n	
				1.0E-02	I					1	0.05		Dichlorophenoxy Acetic Acid, 2,4-	94-75-7	7.0E+02	n	9.6E+03	n					1.7E+02	n	7.0E+01	4.5E-02	n	1.8E-02
3.7E-02	P	3.7E-06	P	4.0E-02	P	4.0E-03	I	V		1		1.4E+03	Dichloropropane, 1,2-	78-87-5	2.5E+00	c**	1.1E+01	c**	7.6E-01	c**	3.3E+00	c**	8.5E-01	c**	5.0E+00	2.8E-04	c**	1.7E-03
				2.0E-02	P			V		1		1.5E+03	Dichloropropane, 1,3-	142-28-9	1.6E+03	ns	2.3E+04	ns					3.7E+02	n		1.3E-01	n	
				3.0E-03	I					1	0.1		Dichloropropanol, 2,3-	616-23-9	1.9E+02	n	2.5E+03	n					5.9E+01	n		1.3E-02	n	
1.0E-01	I	4.0E-06	I	3.0E-02	I	2.0E-02	I	V		1		1.6E+03	Dichloropropene, 1,3-	542-75-6	1.8E+00	c*	8.2E+00	c*	7.0E-01	c*	3.1E+00	c*	4.7E-01	c*		1.7E-04	c*	
2.9E-01	I	8.3E-05	C	5.0E-04	I	5.0E-04	I			1	0.1		Dichlorvos	62-73-7	1.9E+00	c*	7.9E+00	c*	3.4E-02	c*	1.5E-01	c*	2.6E-01	c*		8.1E-05	c*	
				3.0E-05	O					1	0.1		Dicrotophos	141-66-2	1.9E+00	n	2.5E+01	n					6.0E-01	n		1.4E-04	n	
				8.0E-02	P	3.0E-04	X	V		1		2.6E+02	Dicyclopentadiene	77-73-6	1.3E+00	n	5.4E+00	n	3.1E-01	n	1.3E+00	n	6.3E-01	n		2.2E-03	n	

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = OW; R = ORD; N = WI; W = TEF applied; E = RPF applied; G = see user's guide; c = cancer; n = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded; V = volatile; M = mutagen.

Toxicity and Chemical-specific Information													Contaminant		Screening Levels										Protection of Groundwater SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tap Water (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
1.6E+01	I	4.6E-03	I	5.0E-05	I					1	0.1		Dieldrin	60-57-1	3.4E-02	c*	1.4E-01	c	6.1E-04	c	2.7E-03	c	1.8E-03	c		7.1E-05	c	
		3.0E-04	C			5.0E-03	I			1	0.1		Diesel Engine Exhaust	E17136615					9.4E-03	c	4.1E-02	c						
				2.0E-03	P	2.0E-04	P			1	0.1		Diethanolamine	111-42-2	1.3E+02	n	1.6E+03	n	2.1E-01	n	8.8E-01	n	4.0E+01	n		8.1E-03	n	
				3.0E-02	P	1.0E-04	P			1	0.1		Diethylene Glycol Monobutyl Ether	112-34-5	1.9E+03	n	2.4E+04	n	1.0E-01	n	4.4E-01	n	6.0E+02	n		1.3E-01	n	
				6.0E-02	P	3.0E-04	P			1	0.1		Diethylene Glycol Monoethyl Ether	111-90-0	3.8E+03	n	4.8E+04	n	3.1E-01	n	1.3E+00	n	1.2E+03	n		2.4E-01	n	
				1.0E-03	P			V		1		1.1E+05	Diethylformamide	617-84-5	7.8E+01	n	1.2E+03	n					2.0E+01	n		4.1E-03	n	
3.5E+02	C	1.0E-01	C							1	0.1		Diethylstilbestrol	56-53-1	1.6E-03	c	6.6E-03	c	2.8E-05	c	1.2E-04	c	5.1E-05	c		2.8E-05	c	
				8.3E-02	O					1	0.1		Difenzoquat	43222-48-6	5.2E+03	n	6.8E+04	n					1.7E+03	n		2.6E+02	n	
				2.0E-02	I					1	0.1		Diflubenzuron	35367-38-5	1.3E+03	n	1.6E+04	n					2.9E+02	n		3.3E-01	n	
						4.0E+01	I	V		1		1.4E+03	Difluoroethane, 1,1-	75-37-6	4.8E+04	ns	2.0E+05	nms	4.2E+04	n	1.8E+05	n	8.3E+04	n		2.8E+01	n	
						3.0E+01	X	V		1		6.9E+02	Difluoropropane, 2,2-	420-45-1	2.4E+04	ns	1.0E+05	ns	3.1E+04	n	1.3E+05	n	6.3E+04	n		1.4E+02	n	
4.4E-02	C	1.3E-05	C					V		1			Dihydrosafrole	94-58-6	9.9E+00	c	4.5E+01	c	2.2E-01	c	9.4E-01	c	3.0E-01	c		1.9E-04	c	
						7.0E-01	P	V		1		2.3E+03	Diisopropyl Ether	108-20-3	2.2E+03	n	9.4E+03	ns	7.3E+02	n	3.1E+03	n	1.5E+03	n		3.7E-01	n	
				8.0E-02	I			V		1		5.3E+02	Diisopropyl Methylphosphonate	1445-75-6	6.3E+03	ns	9.3E+04	ns					1.6E+03	n		4.5E-01	n	
				2.2E-02	O					1	0.1		Dimethipin	55290-64-7	1.4E+03	n	1.8E+04	n					4.4E+02	n		9.6E-02	n	
				2.2E-03	O					1	0.1		Dimethoate	60-51-5	1.4E+02	n	1.8E+03	n					4.4E+01	n		9.9E-03	n	
1.6E+00	P	1.4E-01	C							1	0.1		Dimethoxybenzidine, 3,3'-	119-90-4	3.3E-01	c	1.4E+00	c	2.0E-05	c	8.8E-05	c	4.7E-02	c		5.8E-05	c	
1.7E-03	P			6.0E-02	P					1	0.1		Dimethyl methylphosphonate	756-79-6	3.2E+02	c*	1.4E+03	c*					4.6E+01	c*		9.6E-03	c*	
4.6E+00	C	1.3E-03	C							1	0.1		Dimethylamino azobenzene [p-]	60-11-7	1.2E-01	c	5.0E-01	c	2.2E-03	c	9.4E-03	c	5.0E-03	c		2.1E-05	c	
5.8E-01	H									1	0.1		Dimethylaniline HCl, 2,4-	21436-96-4	9.4E-01	c	4.0E+00	c					1.3E-01	c		1.2E-04	c	
2.0E-01	P			2.0E-03	X					1	0.1		Dimethylaniline, 2,4-	95-68-1	2.7E+00	c*	1.1E+01	c					3.7E-01	c		2.1E-04	c	
2.7E-02	P			2.0E-03	I			V		1		8.3E+02	Dimethylaniline, N,N-	121-69-7	2.6E+01	c**	1.2E+02	c*					2.5E+00	c*		9.0E-04	c*	
1.1E+01	P									1	0.1		Dimethylbenzidine, 3,3'-	119-93-7	4.9E-02	c	2.1E-01	c					6.5E-03	c		4.3E-05	c	
				1.0E-01	P	3.0E-02	I	V		1		1.1E+05	Dimethylformamide	68-12-2	2.6E+03	n	1.5E+04	n	3.1E+01	n	1.3E+02	n	6.1E+01	n		1.2E-02	n	
				1.0E-04	X	2.0E-06	X	V		1		1.7E+05	Dimethylhydrazine, 1,1-	57-14-7	5.7E-02	n	2.4E-01	n	2.1E-03	n	8.8E-03	n	4.2E-03	n		9.3E-07	n	
5.5E+02	C	1.6E-01	C					V		1		1.9E+05	Dimethylhydrazine, 1,2-	540-73-8	8.8E-04	c	4.1E-03	c	1.8E-05	c	7.7E-05	c	2.8E-05	c		6.5E-09	c	
				2.0E-02	I					1	0.1		Dimethylphenol, 2,4-	105-67-9	1.3E+03	n	1.6E+04	n					3.6E+02	n		4.2E-01	n	
				6.0E-04	I					1	0.1		Dimethylphenol, 2,6-	576-26-1	3.8E+01	n	4.9E+02	n					1.1E+01	n		1.3E-02	n	
				1.0E-03	I					1	0.1		Dimethylphenol, 3,4-	95-65-8	6.3E+01	n	8.2E+02	n					1.8E+01	n		2.1E-02	n	
4.5E-02	C	1.3E-05	C					V		1		4.7E+02	Dimethylvinylchloride	513-37-1	1.1E+00	c	4.8E+00	c	2.2E-01	c	9.4E-01	c	3.3E-01	c		1.1E-04	c	
				8.0E-05	X					1	0.1		Dinitro-o-cresol, 4,6-	534-52-1	5.1E+00	n	6.6E+01	n					1.5E+00	n		2.6E-03	n	
				2.0E-03	I					1	0.1		Dinitro-o-cyclohexyl Phenol, 4,6-	131-89-5	1.3E+02	n	1.6E+03	n					2.3E+01	n		7.7E-01	n	
				4.0E-04	X	2.0E-03	X			1	0.1		Dinitroaniline, 3,5-	618-87-1	2.5E+01	n	3.3E+02	n	2.1E+00	n	8.8E+00	n	7.7E+00	n		4.1E-03	n	
				1.0E-04	P					1	0.1		Dinitrobenzene, 1,2-	528-29-0	6.3E+00	n	8.2E+01	n					1.9E+00	n		1.8E-03	n	
				1.0E-04	I					1	0.1		Dinitrobenzene, 1,3-	99-65-0	6.3E+00	n	8.2E+01	n					2.0E+00	n		1.8E-03	n	
				1.0E-04	P					1	0.1		Dinitrobenzene, 1,4-	100-25-4	6.3E+00	n	8.2E+01	n					2.0E+00	n		1.8E-03	n	
				2.0E-03	I					1	0.1		Dinitrophenol, 2,4-	51-28-5	1.3E+02	n	1.6E+03	n					3.9E+01	n		4.4E-02	n	
6.8E-01	I									1	0.1		Dinitrotoluene Mixture, 2,4/2,6-	E1615210	8.0E-01	c	3.4E+00	c					1.1E-01	c		1.5E-04	c	
3.1E-01	C	8.9E-05	C	2.0E-03	I					1	0.102		Dinitrotoluene, 2,4-	121-14-2	1.7E+00	c*	7.4E+00	c	3.2E-02	c	1.4E-01	c	2.4E-01	c		3.2E-04	c	
1.5E+00	P			3.0E-04	X					1	0.099		Dinitrotoluene, 2,6-	606-20-2	3.6E-01	c*	1.5E+00	c					4.9E-02	c		6.7E-05	c	
				1.0E-04	X					1	0.006		Dinitrotoluene, 2-Amino-4,6-	35572-78-2	7.7E+00	n	1.1E+02	n					1.9E+00	n		1.5E-03	n	
				1.0E-04	X					1	0.009		Dinitrotoluene, 4-Amino-2,6-	19406-51-0	7.7E+00	n	1.1E+02	n					1.9E+00	n		1.5E-03	n	
4.5E-01	X			9.0E-04	X					1	0.1		Dinitrotoluene, Technical grade	25321-14-6	1.2E+00	c*	5.1E+00	c					1.0E-01	c		1.4E-04	c	
				1.0E-03	I					1	0.1		Dinoseb	88-85-7	6.3E+01	n	8.2E+02	n					1.5E+01	n	7.0E+00	1.3E-01	n	6.2E-02
1.0E-01	I	5.0E-06	I	3.0E-02	I	3.0E-02	I	V		1		1.2E+05	Dioxane, 1,4-	123-91-1	5.3E+00	c	2.4E+01	c	5.6E-01	c*	2.5E+00	c*	4.6E-01	c		9.4E-05	c	
													Dioxins															
6.2E+03	I	1.3E+00	I							1	0.03		~Hexachlorodibenzo-p-dioxin, Mixture	34465-46-8	1.0E-04	c	4.7E-04	c	2.2E-06	c	9.4E-06	c	1.3E-05	c		1.7E-05	c	
1.3E+05	C	3.8E+01	C	7.0E-10	I	4.0E-08	C	V		1	0.03		~TCDD, 2,3,7,8-	1746-01-6	4.8E-06	c*	2.2E-05	c*	7.4E-08	c	3.2E-07	c	1.2E-07	c	3.0E-05	5.9E-08	c	1.5E-05
				3.0E-02	I					1	0.1		Diphenamid	957-51-7	1.9E+03	n	2.5E+04	n					5.3E+02	n		5.2E+00	n	
						4.0E-04	X	V		1			Diphenyl Ether	101-84-8	3.4E+01	n	1.4E+02	n	4.2E-01	n	1.8E+00	n	8.3E-01	n		3.4E-03	n	
				8.0E-04	X					1	0.1		Diphenyl Sulfone	127-63-9	5.1E+01	n	6.6E+02	n					1.5E+01	n		3.6E-02	n	
				1.0E-01	O					1	0.1		Diphenylamine	122-39-4	6.3E+03	n	8.2E+04	n					1.3E+03	n		2.3E+00	n	
8.0E-01	I	2.2E-04	I							1	0.1		Diphenylhydrazine, 1,2-	122-66-7	6.8E-01	c	2.9E+00	c	1.3E-02	c	5.6E-02	c	7.8E-02	c		2.5E-04	c	
				2.2E-03	I					1	0.1		Diquat	2764-72-9	1.4E+02	n	1.8E+03	n					4.0E+01	n	2.0E+01	3.3E-01	n	1.7E-01
7.4E+00	C	2.1E-03	C							1	0.1		Direct Black 38	1937-37-7	7.3E-02	c	3.1E-01	c	1.3E-03	c	5.8E-03	c	1.1E-02	c		5.1E+00	c	
7.4E+00	C	2.1E-03	C							1	0.1		Direct Blue 6	2602-46-2	7.3E-02	c	3.1E-01	c	1.3E-03	c	5.8E-03	c	1.1E-02	c		1.7E+01	c	
6.7E+00	C	1.9E-03	C							1	0.1		Direct Brown 95	16071-86-6	8.1E-02	c	3.4E-01	c	1.5E-03	c	6.5E-03	c	1.2E-02	c		1.6E-01	c	
				4.0E-05	I					1	0.1		Disulfoton	298-04-4	2.5E+00	n	3.3E+01	n					5.0E-01	n		9.4E-04	n	
				1.0E-02	I			V		1			Dithiane, 1,4-	505-29-3	7.8E+02	n	1.2E+04	n					2.0E+02	n		9.7E-02	n	
				2.0E-03	I					1	0.1		Diuron	330-54-1	1.3E+02	n	1.6E+03	n					3.6E+01	n		1.5E-02	n	
				2.0E-02	O					1	0.1		Dodine	2439-10-3	1.3E+03	n	1.6E+04	n					4.0E+02	n		2.1E+00	n	
				5.0E-02	O			V		1			EPTC	759-94-4	3.9E+03	n	5.8E+04	n					7.5E+02	n		4.0E-01	n	
				6.0E-03	I			V		1			Endosulfan	115-29-7	4.7E+02	n	7.0E+03	n					1.0E+02	n		1.4E+00	n	
				6.0E-03	P					1	0.1		Endosulfan Sulfate	1031-07-8	3.8E+02	n	4.9E+03	n					1.1E+02	n		2.1E+00	n	
				2.0E-02	I					1	0.1		Endothall	145-73-3	1.3E+03	n	1.6E+04	n					3.8E+02	n	1.0E+02	9.1E-02	n	2.4E-02
				3.0E-04	I					1	0.1		Endrin	72-20-8	1.9E+01	n	2.5E+02	n					2.3E+00	n	2.0E+00	9.2E-02	n	8.1E-02
9.9E-03	I	1.2E-06	I	6.0E-03	P	1.0E-03	I	V		1		1.1E+04	Epichlorohydrin	106-89-8	1.9E+01	n	8.2E+01	n	1.0E+00	n	4.4E+00	n	2.0E+00	n		4.5E-04	n	
						2.0E-02	I	V		1		1.5E+04	Epoxybutane, 1,2-	106-88-7	1.6E+02	n	6.7E+02	n	2.1E+01	n	8.8E+01	n	4.2E+01	n		9.2E-03	n	
				4.0E-02	P					1	0.1		Ethanol, 2-(2-methoxyethoxy)-	111-77-3	2.5E+03	n	3.3E+04	n					8.0E+02	n		1.6E-01	n	
				5.0E-03	I					1	0.1		Ethephon	16672-87-0	3.2E+02	n	4.1E+03	n					1.0E+02	n		2.1E-02	n	
				5.0E-04	I					1	0.1		Ethion	563-12-2	3.2E+01	n	4.1E+02	n					4.3E+00	n		8.5E-03	n	
				1.0E-01	P	6.0E-02	P	V		1		2.4E+04	Ethoxyethanol Acetate, 2-	111-15-9	2.6E+03	n	1.4E+04	n	6.3E+01	n	2.6E+02	n	1.2E+02	n		2.5E-02	n	
				9.0E-02	P	4.0E-02	P	V		1		1.1E+05	Ethoxyethanol, 2-	110-80-5	2.6E+03	n	1.5E+04	n	4.2E+01	n	1.8E+02	n	8.0E+01	n		1.6E-02	n	
				7.0E-01	P	7.0E-02	P	V		1		1.1E+04	Ethyl Acetate	141-78-6	6.2E+02	n	2.6E+03	n	7.3E+01	n	3.1E+02	n	1.4E+02	n		3.1E-02	n	
				5.0E-03	P	8.0E-03	P	V		1		2.5E+03	Ethyl Acrylate	140-88-5	4.7E+01	n	2.1E+02	n	8.3E+00	n	3.5E+01	n	1.4E+01	n		3.2E-03	n	
						4.0E+00	P	V		1		2.1E+03	Ethyl Chloride (Chloroethane)	75-00-3	5.4E+03	ns	2.3E+04	ns	4.2E+03	n	1.8E+04	n	8.3E+03	n		2.4E+00	n	
				2.0E-01	I			V		1		1.0E+04	Ethyl Ether	60-29-7	1.6E+04	ns	2.3E+05	nms					3.9E+03	n		8.8E-01	n	
						3.0E-01	P	V		1		1.1E+03	Ethyl Methacrylate	97-63-2	1.8E+03	ns	7.6E+03	ns	3.1E+02	n	1.3E+03	n	6.3E+02	n		1.5E-01	n	
		8.0E-08	I	1.0E+00	I	4.0E+01	I	V		1		2.9E+03	Ethyl Tertiary Butyl Ether (ETBE)	637-92-3	1.3E+02	c	5.6E+02	c	3.5E+01	c	1.5E+02	c	7.0E+01	c		1.7E-02	c	
				1.0E-05	I					1	0.1		Ethyl-p-nitrophenyl Phosphonate	2104-64-5	6.3E-01	n	8.2E+00	n					8.9E-02	n		2.8E-03	n	

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = OW; R = ORD; N = WI; W = TEF applied; E = RPF applied; G = see user's guide; c = cancer; n = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded; V = volatile; M = mutagen.

Toxicity and Chemical-specific Information														Contaminant		Screening Levels										Protection of Groundwater SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tap Water (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
1.1E-02	C	2.5E-06	C	5.0E-02	P	1.0E+00	I	V		1		4.8E+02	Ethylbenzene	100-41-4	5.8E+00	c	2.5E+01	c	1.1E+00	c	4.9E+00	c	1.5E+00	c	7.0E+02	1.7E-03	c	7.8E-01
				7.0E-02	P					1	0.1		Ethylene Cyanohydrin	109-78-4	4.4E+03	n	5.7E+04	n					1.4E+03	n		2.8E-01	n	
				9.0E-02	P			V		1		1.9E+05	Ethylene Diamine	107-15-3	7.0E+03	n	1.1E+05	nm					1.8E+03	n		4.1E-01	n	
				8.0E-01	A	4.0E-01	C			1	0.1		Ethylene Glycol	107-21-1	5.1E+04	n	6.6E+05	nm	4.2E+02	n	1.8E+03	n	1.6E+04	n		3.2E+00	n	
				1.0E-01	I	1.6E+00	I			1	0.1		Ethylene Glycol Monobutyl Ether	111-76-2	6.3E+03	n	8.2E+04	n	1.7E+03	n	7.0E+03	n	2.0E+03	n		4.1E-01	n	
3.1E-01	C	3.0E-03	I			3.0E-02	C	V	M	1		1.2E+05	Ethylene Oxide	75-21-8	2.0E-03	c	2.5E-02	c	3.4E-04	c	4.1E-03	c	6.7E-04	c		1.4E-07	c	
4.5E-02	C	1.3E-05	C	8.0E-05	I					1	0.1		Ethylene Thiourea	96-45-7	5.1E+00	n	5.1E+01	c**	2.2E-01	c	9.4E-01	c	1.6E+00	n		3.6E-04	n	
6.5E+01	C	1.9E-02	C					V		1		1.5E+05	Ethyleneimine	151-56-4	2.7E-03	c	1.2E-02	c	1.5E-04	c	6.5E-04	c	2.4E-04	c		5.2E-08	c	
				3.0E+00	I					1	0.1		Ethylphthalyl Ethyl Glycolate	84-72-0	1.9E+05	nm	2.5E+06	nm					5.8E+04	n		1.3E+02	n	
				2.5E-04	I					1	0.1		Fenamiphos	22224-92-6	1.6E+01	n	2.1E+02	n					4.4E+00	n		4.3E-03	n	
				2.5E-02	I					1	0.1		Fenpropathrin	39515-41-8	1.6E+03	n	2.1E+04	n					6.4E+01	n		2.9E+00	n	
				2.5E-02	I					1	0.1		Fenvalerate	51630-58-1	1.6E+03	n	2.1E+04	n					5.0E+02	n		3.2E+02	n	
				1.3E-02	I					1	0.1		Fluometuron	2164-17-2	8.2E+02	n	1.1E+04	n					2.4E+02	n		1.9E-01	n	
				4.0E-02	C	1.3E-02	C			1			Fluoride	16984-48-8	3.1E+03	n	4.7E+04	n	1.4E+01	n	5.7E+01	n	8.0E+02	n	4.0E+03	1.2E+02	n	6.0E+02
				6.0E-02	I	1.3E-02	C			1			Fluorine (Soluble Fluoride)	7782-41-4	4.7E+03	n	7.0E+04	n	1.4E+01	n	5.7E+01	n	1.2E+03	n	4.0E+03	1.8E+02	n	6.0E+02
				8.0E-02	I					1	0.1		Fluridone	59756-60-4	5.1E+03	n	6.6E+04	n					1.4E+03	n		1.6E+02	n	
				4.0E-02	O					1	0.1		Flurprimidol	56425-91-3	2.5E+03	n	3.3E+04	n					6.9E+02	n		3.1E+00	n	
				2.0E-03	O					1	0.1		Flusilazole	85509-19-9	1.3E+02	n	1.6E+03	n					3.1E+01	n		5.1E+00	n	
				5.0E-01	O					1	0.1		Flutolanil	66332-96-5	3.2E+04	n	4.1E+05	nm					7.9E+03	n		4.2E+01	n	
				1.0E-02	I					1	0.1		Fluvalinate	69409-94-5	6.3E+02	n	8.2E+03	n					2.0E+02	n		2.9E+02	n	
				9.0E-02	O					1	0.1		Folpet	133-07-3	5.7E+03	n	7.4E+04	n					1.6E+03	n		3.9E-01	n	
				1.0E-02	O					1	0.1		Fomesafen	72178-02-0	6.3E+02	n	8.2E+03	n					1.9E+02	n		6.3E-01	n	
				2.0E-03	I					1	0.1		Fonofos	944-22-9	1.3E+02	n	1.6E+03	n					2.4E+01	n		4.7E-02	n	
2.1E-02	C	1.3E-05	I	2.0E-01	I	9.8E-03	A	V		1		4.2E+04	Formaldehyde	50-00-0	1.1E+01	c*	5.0E+01	c*	2.2E-01	c*	9.4E-01	c*	3.9E-01	c*		7.8E-05	c*	
				9.0E-01	P	3.0E-04	X	V		1		1.1E+05	Formic Acid	64-18-6	2.9E+01	n	1.2E+02	n	3.1E-01	n	1.3E+00	n	6.3E-01	n		1.3E-04	n	
				2.5E+00	O					1	0.1		Fosetyl-AL	39148-24-8	1.6E+05	nm	2.1E+06	nm					5.0E+04	n		6.6E+02	n	
													Furans															
				1.0E-03	X			V		1			~Dibenzofuran	132-64-9	7.8E+01	n	1.2E+03	n					7.9E+00	n		1.5E-01	n	
				1.0E-03	I			V		1		6.2E+03	~Furan	110-00-9	7.8E+01	n	1.2E+03	n					1.9E+01	n		7.3E-03	n	
				9.0E-01	I	2.0E+00	I	V		1		1.7E+05	~Tetrahydrofuran	109-99-9	1.8E+04	n	9.5E+04	n	2.1E+03	n	8.8E+03	n	3.4E+03	n		7.5E-01	n	
3.8E+00	H									1	0.1		Furazolidone	67-45-8	1.4E-01	c	6.0E-01	c					2.0E-02	c		3.9E-05	c	
				3.0E-03	I	5.0E-02	H	V		1		1.0E+04	Furfural	98-01-1	2.1E+02	n	2.6E+03	n	5.2E+01	n	2.2E+02	n	3.8E+01	n		8.1E-03	n	
1.5E+00	C	4.3E-04	C							1	0.1		Furium	531-82-8	3.6E-01	c	1.5E+00	c	6.5E-03	c	2.9E-02	c	5.1E-02	c		6.8E-05	c	
3.0E-02	I	8.6E-06	C							1	0.1		Furmecyclox	60568-05-0	1.8E+01	c	7.7E+01	c	3.3E-01	c	1.4E+00	c	1.1E+00	c		1.2E-03	c	
				6.0E-03	O					1	0.1		Glufosinate, Ammonium	77182-82-2	3.8E+02	n	4.9E+03	n					1.2E+02	n		2.6E-02	n	
				1.0E-01	A	8.0E-05	C			1	0.1		Glutaraldehyde	111-30-8	6.0E+03	n	7.0E+04	n	8.3E-02	n	3.5E-01	n	2.0E+03	n		4.0E-01	n	
				4.0E-04	I	1.0E-03	X	V		1		1.1E+05	Glycidaldehyde	765-34-4	2.3E+01	n	2.1E+02	n	1.0E+00	n	4.4E+00	n	1.7E+00	n		3.3E-04	n	
				1.0E-01	I					1	0.1		Glyphosate	1071-83-6	6.3E+03	n	8.2E+04	n					2.0E+03	n	7.0E+02	8.8E+00	n	3.1E+00
				1.0E-02	X			V		1			Guanidine	113-00-8	7.8E+02	n	1.2E+04	n					2.0E+02	n		4.5E-02	n	
				2.0E-02	P					1	0.1		Guanidine Chloride	50-01-1	1.3E+03	n	1.6E+04	n					4.0E+02	n				
				3.0E-02	X					1	0.1		Guanidine Nitrate	506-93-4	1.9E+03	n	2.5E+04	n					6.0E+02	n		1.5E-01	n	
				5.0E-05	I					1	0.1		Haloxyfop, Methyl	69806-40-2	3.2E+00	n	4.1E+01	n					7.6E-01	n		8.4E-03	n	
4.5E+00	I	1.3E-03	I	1.0E-04	A			V		1			Heptachlor	76-44-8	1.3E-01	c*	6.3E-01	c	2.2E-03	c	9.4E-03	c	1.4E-03	c	4.0E-01	1.2E-04	c	3.3E-02
9.1E+00	I	2.6E-03	I	1.3E-05	I			V		1			Heptachlor Epoxide	1024-57-3	7.0E-02	c*	3.3E-01	c*	1.1E-03	c	4.7E-03	c	1.4E-03	c*	2.0E-01	2.8E-05	c*	4.1E-03
						3.0E-03	X	V		1		2.1E+02	Heptanal, n-	111-71-7	2.4E+01	n	1.0E+02	n	3.1E+00	n	1.3E+01	n	6.3E+00	n		1.4E-03	n	
				3.0E-04	X	4.0E-01	P	V		1		5.8E+01	Heptane, N-	142-82-5	2.2E+01	n	2.9E+02	ns	4.2E+02	n	1.8E+03	n	6.0E+00	n		4.8E-02	n	
				2.0E-03	I			V		1			Hexabromobenzene	87-82-1	1.6E+02	n	2.3E+03	n					4.0E+01	n		2.3E-01	n	
				2.0E-04	I					1	0.1		Hexabromodiphenyl ether, 2,2',4,4',5,5'- (BDE-153)	68631-49-2	1.3E+01	n	1.6E+02	n					4.0E+00	n				
1.6E+00	I	4.6E-04	I	1.0E-05	P			V		1			Hexachlorobenzene	118-74-1	2.1E-01	c**	9.6E-01	c*	6.1E-03	c	2.7E-02	c	9.8E-03	c*	1.0E+00	1.2E-04	c*	1.3E-02
7.8E-02	I	2.2E-05	I	1.0E-03	P			V		1		1.7E+01	Hexachlorobutadiene	87-68-3	1.2E+00	c*	5.3E+00	c	1.3E-01	c	5.6E-01	c	1.4E-01	c*		2.7E-04	c*	
6.3E+00	I	1.8E-03	I							1	0.1		Hexachlorocyclohexane, Alpha-	319-84-6	8.6E-02	c	3.6E-01	c	1.6E-03	c	6.8E-03	c	7.2E-03	c		4.2E-05	c	
1.8E+00	I	5.3E-04	I							1	0.1		Hexachlorocyclohexane, Beta-	319-85-7	3.0E-01	c	1.3E+00	c	5.3E-03	c	2.3E-02	c	2.5E-02	c		1.5E-04	c	
1.1E+00	C	3.1E-04	C	3.0E-04	I					1	0.04		Hexachlorocyclohexane, Gamma- (Lindane)	58-89-9	5.7E-01	c*	2.5E+00	c	9.1E-03	c	4.0E-02	c	4.2E-02	c*	2.0E-01	2.4E-04	c*	1.2E-03
1.8E+00	I	5.1E-04	I							1	0.1		Hexachlorocyclohexane, Technical	608-73-1	3.0E-01	c	1.3E+00	c	5.5E-03	c	2.4E-02	c	2.5E-02	c		1.5E-04	c	
				6.0E-03	I	2.0E-04	I	V		1		1.6E+01	Hexachlorocyclopentadiene	77-47-4	1.8E+00	n	7.5E+00	n	2.1E-01	n	8.8E-01	n	4.1E-01	n	5.0E+01	1.3E-03	n	1.6E-01
4.0E-02	I	1.1E-05	C	7.0E-04	I	3.0E-02	I	V		1			Hexachloroethane	67-72-1	1.8E+00	c*	8.0E+00	c*	2.6E-01	c	1.1E+00	c	3.3E-01	c*		2.0E-04	c*	
				3.0E-04	I					1	0.1		Hexachlorophene	70-30-4	1.9E+01	n	2.5E+02	n					6.0E+00	n		8.0E+00	n	
8.0E-02	I			4.0E-03	I					1	0.015		Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	121-82-4	8.3E+00	c*	3.8E+01	c					9.7E-01	c*		3.7E-04	c*	
						1.0E-05	I	V		1		3.4E+03	Hexamethylene Diisocyanate, 1,6-	822-06-0	3.1E+00	n	1.3E+01	n	1.0E-02	n	4.4E-02	n	2.1E-02	n		2.1E-04	n	
						4.0E-04	C			1	0.1		Hexamethylene diisocyanate biuret	4035-89-6	5.7E+05	nm	2.4E+06	nm	4.2E-01	n	1.8E+00	n						
						4.0E-04	C			1	0.1		Hexamethylene diisocyanate isocyanurate	3779-63-3	5.7E+05	nm	2.4E+06	nm	4.2E-01	n	1.8E+00	n						
				4.0E-04	P					1	0.1		Hexamethylphosphoramide	680-31-9	2.5E+01	n	3.3E+02	n					8.0E+00	n		1.8E-03	n	
		2.0E-07	X			6.0E-01	P	V		1		1.4E+02	Hexane, Commercial	E5241997	1.2E+01	c*	5.1E+01	c*	1.4E+01	c*	6.1E+01	c*	2.8E+01	c*		2.0E-01	c*	
						7.0E-01	I	V		1		1.4E+02	Hexane, N-	110-54-3	6.1E+02	ns	2.5E+03	ns	7.3E+02	n	3.1E+03	n	1.5E+03	n		1.0E+01	n	
				2.0E+00	P					1	0.1		Hexanedioic Acid	124-04-9	1.3E+05	nm	1.6E+06	nm					4.0E+04	n		9.9E+00	n	
9.5E-03	P			7.0E-02	P	4.0E-04	P	V		1		2.7E+02	Hexanol, 1-,2-ethyl- (2-Ethyl-1-hexanol)	104-76-7	1.5E+01	n	6.3E+01	n	4.2E-01	n	1.8E+00	n	8.3E-01	n		2.3E-04	n	
				5.0E-03	I	3.0E-02	I	V		1		3.3E+03	Hexanone, 2-	591-78-6	2.0E+02	n	1.3E+03	n	3.1E+01	n	1.3E+02	n	3.8E+01	n		8.8E-03	n	
				3.3E-02	I					1	0.1		Hexazinone	51235-04-2	2.1E+03	n	2.7E+04	n					6.4E+02	n		3.0E-01	n	
				2.5E-02	I					1	0.1		Hexythiazox	78587-05-0	1.6E+03	n	2.1E+04	n					1.1E+02	n		5.0E-01	n	
				1.7E-02	O					1	0.1		Hydramethylnon	67485-29-4	1.1E+03	n	1.4E+04	n					3.4E+02	n		1.2E+05	n	
3.0E+00	I	4.9E-03	I			3.0E-05	P	V		1		1.1E+05	Hydrazine	302-01-2	3.2E-02	c*	1.4E-01	c*	5.7E-04	c*	2.5E-03	c*	1.1E-03	c*		2.2E-07	c*	
3.0E+00	I	4.9E-03	I							1			Hydrazine Sulfate	10034-93-2	2.3E-01	c	1.1E+00	c	5.7E-04	c	2.5E-03	c	2.6E-02	c				
						2.0E-02	I	V		1			Hydrogen Chloride	7647-01-0	2.8E+07	nm	1.2E+08	nm	2.1E+01	n	8.8E+01	n	4.2E+01	n				
				4.0E-02	C	1.4E-02	C	V		1			Hydrogen Fluoride	7664-39-3	3.1E+03	n	4.7E+04	n	1.5E+01	n	6.1E+01	n	2.8E+01	n				
						2.0E-03	I	V		1			Hydrogen Sulfide	7783-06-4	2.8E+06	nm	1.2E+07	nm	2.1E+00	n	8.8E+00	n	4.2E+00	n				
6.0E-02	P			4.0E-02	P					1	0.1		Hydroquinone	123-31-9	9.0E+00	c	3.8E+01	c					1.3E+00	c		8.7E-04	c	
6.1E-02	O			1.1E-01	O					1	0.1		Imazalil	35554-44-0	8.9E+00	c	3.8E+01	c					9.0E-01	c		1.5E-02	c	
				2.5E-01	I					1	0.1		Imazaquin	81335-37-7	1.6E+04	n	2.1E+05	nm					4.9E+03	n		2.4E+01	n	
				2.5E+00	O					1	0.1		Imazethapyr	81335-77-5	1.6E+05	nm	2.1E+06	nm					4.7E+04	n		4.1E+01	n	
				1.0E-02	A					1			Iodine	7553-56-2	7.8E+02	n	1.2E+04	n					2.0E+02	n		1.2E+01	n	

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = OW; R = ORD; N = WI; W = TEF applied; E = RPF applied; G = see user's guide; c = cancer; n = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded; V = volatile; M = mutagen.

Toxicity and Chemical-specific Information														Contaminant		Screening Levels										Protection of Groundwater SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tap Water (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
				4.0E-02	I					1	0.1		Iprodione	36734-19-7	2.5E+03	n	3.3E+04	n					7.4E+02	n		2.2E-01	n	
				7.0E-01	P					1			Iron	7439-89-6	5.5E+04	n	8.2E+05	nm					1.4E+04	n		3.5E+02	n	
				3.0E-01	I	4.0E-01	X	V		1		1.0E+04	Isobutyl Alcohol	78-83-1	7.8E+03	n	4.3E+04	ns	4.2E+02	n	1.8E+03	n	7.3E+02	n		1.5E-01	n	
9.5E-04	I			2.0E-01	I	2.0E+00	C			1	0.1		Isophorone	78-59-1	5.7E+02	c*	2.4E+03	c*	2.1E+03	n	8.8E+03	n	7.8E+01	c*		2.6E-02	c*	
				1.5E-02	I			V		1			Isopropalin	33820-53-0	1.2E+03	n	1.8E+04	n					4.0E+01	n		9.2E-01	n	
				2.0E+00	P	2.0E-01	P	V		1		1.1E+05	Isopropanol	67-63-0	5.6E+03	n	2.4E+04	n	2.1E+02	n	8.8E+02	n	4.1E+02	n		8.4E-02	n	
				1.0E-01	I					1	0.1		Isopropyl Methyl Phosphonic Acid	1832-54-8	6.3E+03	n	8.2E+04	n					2.0E+03	n		4.3E-01	n	
				5.0E-02	I					1	0.1		Isoxaben	82558-50-7	3.2E+03	n	4.1E+04	n					7.3E+02	n		2.0E+00	n	
						3.0E-01	A	V		1			Jet propulsion fuel 7 (JP-7)	E1737665	4.3E+08	nm	1.8E+09	nm	3.1E+02	n	1.3E+03	n	6.3E+02	n				
				8.0E-03	O					1	0.1		Lactofen	77501-63-4	5.1E+02	n	6.6E+03	n					1.0E+02	n		4.6E+00	n	
				2.0E-04	X					1	0.1		Lactonitrile	78-97-7	1.3E+01	n	1.6E+02	n					4.0E+00	n		8.1E-04	n	
				5.0E-05	P					1			Lanthanum	7439-91-0	3.9E+00	n	5.8E+01	n					1.0E+00	n				
				2.1E-05	P					1	0.1		Lanthanum Acetate Hydrate	100587-90-4	1.3E+00	n	1.7E+01	n					4.2E-01	n				
				1.9E-05	P					1			Lanthanum Chloride Heptahydrate	10025-84-0	1.5E+00	n	2.2E+01	n					3.7E-01	n				
				2.8E-05	P					1			Lanthanum Chloride, Anhydrous	10099-58-8	2.2E+00	n	3.3E+01	n					5.7E-01	n				
				1.6E-05	P					1			Lanthanum Nitrate Hexahydrate	10277-43-7	1.3E+00	n	1.9E+01	n					3.2E-01	n				
													Lead Compounds															
8.5E-03	C	1.2E-05	C							1			~Lead Phosphate	7446-27-7	8.2E+01	c	3.8E+02	c	2.3E-01	c	1.0E+00	c	9.1E+00	c				
2.1E-01	C	8.0E-05	C							1	0.1		~Lead acetate	301-04-2	2.6E+00	c	1.1E+01	c	3.5E-02	c	1.5E-01	c	3.7E-01	c		7.5E-05	c	
										1			~Lead and Compounds	7439-92-1	4.0E+02	G	8.0E+02	G	1.5E-01	G			1.5E+01	G	1.5E+01			1.4E+01
3.8E-02	C	1.1E-05	C							1	0.1		~Lead subacetate	1335-32-6	1.4E+01	c	6.0E+01	c	2.6E-01	c	1.1E+00	c	2.1E+00	c		4.5E-04	c	
				1.0E-07	I			V		1		2.4E+00	~Tetraethyl Lead	78-00-2	7.8E-03	n	1.2E-01	n					1.3E-03	n		4.7E-06	n	
				5.0E-06	P			V		1		3.8E+02	Lewisite	541-25-3	3.9E-01	n	5.8E+00	n					9.0E-02	n		3.8E-05	n	
				7.7E-03	O					1	0.1		Linuron	330-55-2	4.9E+02	n	6.3E+03	n					1.3E+02	n		1.1E-01	n	
				2.0E-03	P					1			Lithium	7439-93-2	1.6E+02	n	2.3E+03	n					4.0E+01	n		1.2E+01	n	
				5.0E-04	I					1	0.1		MCPA	94-74-6	3.2E+01	n	4.1E+02	n					7.5E+00	n		2.0E-03	n	
				4.4E-02	O					1	0.1		MCPB	94-81-5	2.8E+03	n	3.6E+04	n					6.5E+02	n		2.6E-01	n	
				1.0E-03	I					1	0.1		MCPP	93-65-2	6.3E+01	n	8.2E+02	n					1.6E+01	n		4.7E-03	n	
				2.0E-02	I					1	0.1		Malathion	121-75-5	1.3E+03	n	1.6E+04	n					3.9E+02	n		1.0E-01	n	
				1.0E-01	I	7.0E-04	C			1	0.1		Maleic Anhydride	108-31-6	6.3E+03	n	8.0E+04	n	7.3E-01	n	3.1E+00	n	1.9E+03	n		3.8E-01	n	
				5.0E-01	I					1	0.1		Maleic Hydrazide	123-33-1	3.2E+04	n	4.1E+05	nm					1.0E+04	n		2.1E+00	n	
				1.0E-04	P					1	0.1		Malononitrile	109-77-3	6.3E+00	n	8.2E+01	n					2.0E+00	n		4.1E-04	n	
				3.0E-02	H					1	0.1		Mancozeb	8018-01-7	1.9E+03	n	2.5E+04	n					5.4E+02	n		7.6E-01	n	
				5.0E-03	I					1	0.1		Maneb	12427-38-2	3.2E+02	n	4.1E+03	n					9.8E+01	n		1.4E-01	n	
				1.4E-01	I	5.0E-05	I			1			Manganese (Diet)	7439-96-5					5.2E-02	n	2.2E-01	n						
				2.4E-02	G	5.0E-05	I			0.04			Manganese (Non-diet)	7439-96-5	1.8E+03	n	2.6E+04	n	5.2E-02	n	2.2E-01	n	4.3E+02	n		2.8E+01	n	
				9.0E-05	H					1	0.1		Mephosfolan	950-10-7	5.7E+00	n	7.4E+01	n					1.8E+00	n		2.6E-03	n	
				3.0E-02	I					1	0.1		Mepiquat Chloride	24307-26-4	1.9E+03	n	2.5E+04	n					6.0E+02	n		2.0E-01	n	
1.1E-02	P			4.0E-03	P					1	0.1		Mercaptobenzothiazole, 2-	149-30-4	4.9E+01	c**	2.1E+02	c*					6.3E+00	c*		1.8E-02	c*	
													Mercury Compounds															
				3.0E-04	I	3.0E-04	G			0.07			~Mercuric Chloride (and other Mercury salts)	7487-94-7	2.3E+01	n	3.5E+02	n	3.1E-01	n	1.3E+00	n	5.7E+00	n	2.0E+00			
						3.0E-04	I	V		1		3.1E+00	~Mercury (elemental)	7439-97-6	1.1E+01	ns	4.6E+01	ns	3.1E-01	n	1.3E+00	n	6.3E-01	n	2.0E+00	3.3E-02	n	1.0E-01
				1.0E-04	I					1			~Methyl Mercury	22967-92-6	7.8E+00	n	1.2E+02	n					2.0E+00	n		1.4E+01	n	
				8.0E-05	I					1	0.1		~Phenylmercuric Acetate	62-38-4	5.1E+00	n	6.6E+01	n					1.6E+00	n		5.0E-04	n	
				3.0E-05	I			V		1			Merphos	150-50-5	2.3E+00	n	3.5E+01	n					6.0E-01	n		5.9E-02	n	
				6.0E-02	I					1	0.1		Metalaxyl	57837-19-1	3.8E+03	n	4.9E+04	n					1.2E+03	n		3.3E-01	n	
				1.0E-04	I	3.0E-02	P	V		1		4.6E+03	Methacrylonitrile	126-98-7	7.5E+00	n	1.0E+02	n	3.1E+01	n	1.3E+02	n	1.9E+00	n		4.3E-04	n	
				5.0E-05	I					1	0.1		Methamidophos	10265-92-6	3.2E+00	n	4.1E+01	n					1.0E+00	n		2.1E-04	n	
				2.0E+00	I	2.0E+01	I	V		1		1.1E+05	Methanol	67-56-1	1.2E+05	nms	1.2E+06	nms	2.1E+04	n	8.8E+04	n	2.0E+04	n		4.1E+00	n	
				1.5E-03	O					1	0.1		Methidathion	950-37-8	9.5E+01	n	1.2E+03	n					2.9E+01	n		7.1E-03	n	
				2.5E-02	I					1	0.1		Methomyl	16752-77-5	1.6E+03	n	2.1E+04	n					5.0E+02	n		1.1E-01	n	
4.9E-02	C									1	0.1		Methoxy-5-nitroaniline, 2-	99-59-2	1.1E+01	c	4.7E+01	c					1.5E+00	c		5.3E-04	c	
				5.0E-03	I					1	0.1		Methoxychlor	72-43-5	3.2E+02	n	4.1E+03	n					3.7E+01	n	4.0E+01	2.0E+00	n	2.2E+00
				8.0E-03	P	1.0E-03	P	V		1		1.2E+05	Methoxyethanol Acetate, 2-	110-49-6	1.1E+02	n	5.1E+02	n	1.0E+00	n	4.4E+00	n	2.1E+00	n		4.2E-04	n	
				5.0E-03	P	7.0E-03	P	V		1		1.1E+05	Methoxyethanol, 2-	109-86-4	2.6E+02	n	2.0E+03	n	7.3E+00	n	3.1E+01	n	1.3E+01	n		2.6E-03	n	
				1.0E+00	X			V		1		2.9E+04	Methyl Acetate	79-20-9	7.8E+04	ns	1.2E+06	nms					2.0E+04	n		4.1E+00	n	
						2.0E-02	P	V		1		6.8E+03	Methyl Acrylate	96-33-3	1.5E+02	n	6.1E+02	n	2.1E+01	n	8.8E+01	n	4.2E+01	n		8.9E-03	n	
				6.0E-01	I	5.0E+00	I	V		1		2.8E+04	Methyl Ethyl Ketone (2-Butanone)	78-93-3	2.7E+04	n	1.9E+05	nms	5.2E+03	n	2.2E+04	n	5.6E+03	n		1.2E+00	n	
		1.0E-03	X	1.0E-03	P	2.0E-05	X	V		1		1.8E+05	Methyl Hydrazine	60-34-4	1.4E-01	c**	6.2E-01	c**	2.8E-03	c**	1.2E-02	c**	5.6E-03	c**		1.3E-06	c**	
						3.0E+00	I	V		1		3.4E+03	Methyl Isobutyl Ketone (4-methyl-2-pentanone)	108-10-1	3.3E+04	ns	1.4E+05	nms	3.1E+03	n	1.3E+04	n	6.3E+03	n		1.4E+00	n	
						1.0E-03	C	V		1		1.0E+04	Methyl Isocyanate	624-83-9	4.6E+00	n	1.9E+01	n	1.0E+00	n	4.4E+00	n	2.1E+00	n		5.9E-04	n	
				1.4E+00	I	7.0E-01	I	V		1		2.4E+03	Methyl Methacrylate	80-62-6	4.4E+03	ns	1.9E+04	ns	7.3E+02	n	3.1E+03	n	1.4E+03	n		3.0E-01	n	
				2.5E-04	I					1	0.1		Methyl Parathion	298-00-0	1.6E+01	n	2.1E+02	n					4.5E+00	n		7.4E-03	n	
				6.0E-02	X					1	0.1		Methyl Phosphonic Acid	993-13-5	3.8E+03	n	4.9E+04	n					1.2E+03	n		2.4E-01	n	
				6.0E-03	H	4.0E-02	H	V		1		3.9E+02	Methyl Styrene (Mixed Isomers)	25013-15-4	3.2E+02	n	2.6E+03	ns	4.2E+01	n	1.8E+02	n	2.3E+01	n		3.8E-02	n	
9.9E-02	C	2.8E-05	C							1	0.1		Methyl methanesulfonate	66-27-3	5.5E+00	c	2.3E+01	c	1.0E-01	c	4.4E-01	c	7.9E-01	c		1.6E-04	c	
1.8E-03	C	2.6E-07	C			3.0E+00	I	V		1		8.9E+03	Methyl tert-Butyl Ether (MTBE)	1634-04-4	4.7E+01	c	2.1E+02	c	1.1E+01	c	4.7E+01	c	1.4E+01	c		3.2E-03	c	
				3.0E-04	X					1	0.1		Methyl-1,4-benzenediamine dihydrochloride, 2-	615-45-2	1.9E+01	n	2.5E+02	n					6.0E+00	n		3.6E-03	n	
						3.0E+00	X	V		1		2.5E+03	Methyl-2-Pentanol, 4-	108-11-2	5.4E+04	ns	2.3E+05	nms	3.1E+03	n	1.3E+04	n	6.3E+03	n		1.4E+00	n	
9.0E-03	P			2.0E-02	X					1	0.1		Methyl-5-Nitroaniline, 2-	99-55-8	6.0E+01	c*	2.6E+02	c*					8.2E+00	c*		4.6E-03	c*	
8.3E+00	C	2.4E-03	C							1	0.1		Methyl-N-nitro-N-nitrosoguanidine, N-	70-25-7	6.5E-02	c	2.8E-01	c	1.2E-03	c	5.1E-03	c	9.4E-03	c		3.2E-06	c	
1.3E-01	C	3.7E-05	C							1	0.1		Methylaniline Hydrochloride, 2-	636-21-5	4.2E+00	c	1.8E+01	c	7.6E-02	c	3.3E-01	c	6.0E-01	c		2.6E-04	c	
				1.0E-02	A					1	0.1		Methylarsonic acid	124-58-3	6.3E+02	n	8.2E+03	n					2.0E+02	n		5.8E-02	n	
				2.0E-04	X					1	0.1		Methylbenzene,1-4-diamine monohydrochloride, 2-	74612-12-7	1.3E+01	n	1.6E+02	n					4.0E+00	n				
1.0E-01	X			3.0E-04	X					1	0.1		Methylbenzene-1,4-diamine sulfate, 2-	615-50-9	5.4E+00	c**	2.3E+01	c*					7.8E-01	c**				
2.2E+01	C	6.3E-03	C						M	1	0.1		Methylcholanthrene, 3-	56-49-5	5.5E-03	c	1.0E-01	c	1.6E-04	c	1.9E-03	c	1.1E-03	c		2.2E-03	c	
						9.5E-02	X	V		1		6.8E+01	Methylcyclohexane	108-87-2	9.8E+01	ns	4.1E+02	ns	9.9E+01	n	4.2E+02	n	2.0E+02	n		4.4E-01	n	
2.0E-03	I	1.0E-08	I	6.0E-03	I	6.0E-01	I	V	M	1		3.3E+03	Methylene Chloride	75-09-2	5.7E+01	c**	1.0E+03	c**	1.0E+02	c**	1.2E+03	c**	1.1E+01	c**	5.0E+00	2.9E-03	c**	1.3E-03
1.0E-01	P	4.3E-04	C	2.0E-03	P				M	1	0.1		Methylene-bis(2-chloroaniline), 4,4'-	101-14-4	1.2E+00	c	2.3E+01	c*	2.4E-03	c	2.9E-02	c	1.6E-01	c		1.8E-03	c	
4.6E-02	I	1.3E-05	C							1	0.1		Methylene-bis(N,N-dimethyl) Aniline, 4,4'-	101-61-1	1.2E+01	c	5.0E+01	c	2.2E-01	c	9.4E-01	c	7.0E-01	c		3.9E-03	c	

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = OW; R = ORD; N = WI; W = TEF applied; E = RPF applied; G = see user's guide; c = cancer; n = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded; V = volatile; M = mutagen.

Toxicity and Chemical-specific Information													Contaminant		Screening Levels										Protection of Groundwater SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tap Water (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
1.6E+00	C	4.6E-04	C			2.0E-02	C			1	0.1		Methylenebisbenzenamine, 4,4'-	101-77-9	3.4E-01	c	1.4E+00	c	6.1E-03	c	2.7E-02	c	4.7E-02	c		2.1E-04	c	
						6.0E-04	I			1	0.1		Methylenediphenyl Diisocyanate	101-68-8	8.5E+05	nm	3.6E+06	nm	6.3E-01	n	2.6E+00	n						
				7.0E-02	H			V		1		5.0E+02	Methylstyrene, Alpha-	98-83-9	5.5E+03	ns	8.2E+04	ns					7.8E+02	n		1.2E+00	n	
				1.5E-01	I					1	0.1		Metolachlor	51218-45-2	9.5E+03	n	1.2E+05	nm					2.7E+03	n		3.2E+00	n	
				2.5E-02	I					1	0.1		Metribuzin	21087-64-9	1.6E+03	n	2.1E+04	n					4.9E+02	n		1.5E-01	n	
				2.5E-01	I					1	0.1		Metsulfuron-methyl	74223-64-6	1.6E+04	n	2.1E+05	nm					4.9E+03	n		1.9E+00	n	
		4.5E-06	X	1.0E-02	X	1.0E-01	P	V		1		6.9E+00	Midrange Aliphatic Hydrocarbon Streams	E1790669	6.5E-01	c	2.8E+00	c	6.2E-01	c	2.7E+00	c	1.2E+00	c*		1.8E-02	c*	
				3.0E+00	P			V		1		3.4E-01	Mineral oils	8012-95-1	2.3E+05	nms	3.5E+06	nms					6.0E+04	n		2.4E+03	n	
1.8E+01	C	5.1E-03	C	2.0E-04	I			V		1			Mirex	2385-85-5	3.6E-02	c	1.7E-01	c	5.5E-04	c	2.4E-03	c	8.8E-04	c		6.3E-04	c	
				2.0E-03	I					1	0.1		Molinate	2212-67-1	1.3E+02	n	1.6E+03	n					3.0E+01	n		1.7E-02	n	
				5.0E-03	I	2.0E-03	A			1			Molybdenum	7439-98-7	3.9E+02	n	5.8E+03	n	2.1E+00	n	8.8E+00	n	1.0E+02	n		2.0E+00	n	
				1.0E-01	I					1			Monochloramine	10599-90-3	7.8E+03	n	1.2E+05	nm					2.0E+03	n	4.0E+03(G)			
				2.0E-03	P					1	0.1		Monomethylaniline	100-61-8	1.3E+02	n	1.6E+03	n					3.8E+01	n		1.4E-02	n	
				2.5E-02	I					1	0.1		Myclobutanil	88671-89-0	1.6E+03	n	2.1E+04	n					4.5E+02	n		5.6E+00	n	
				3.0E-04	X					1	0.1		N,N'-Diphenyl-1,4-benzenediamine	74-31-7	1.9E+01	n	2.5E+02	n					3.6E+00	n		3.7E-01	n	
				2.0E-03	I			V		1			Naled	300-76-5	1.6E+02	n	2.3E+03	n					4.0E+01	n		1.8E-02	n	
				3.0E-02	X	1.0E-01	P	V		1			Naphtha, High Flash Aromatic (HFAN)	64742-95-6	2.3E+03	n	3.5E+04	n	1.0E+02	n	4.4E+02	n	1.5E+02	n				
1.8E+00	C	0.0E+00	C							1	0.1		Naphthylamine, 2-	91-59-8	3.0E-01	c	1.3E+00	c					3.9E-02	c		2.0E-04	c	
				1.2E-01	O					1	0.1		Napropamide	15299-99-7	7.6E+03	n	9.8E+04	n					2.0E+03	n		1.3E+01	n	
		2.6E-04	C	1.1E-02	C	1.4E-05	C			1	0.1		Nickel Acetate	373-02-4	6.7E+02	n	8.1E+03	n	1.1E-02	c**	4.7E-02	c**	2.2E+02	n		4.5E-02	n	
		2.6E-04	C	1.1E-02	C	1.4E-05	C			1	0.1		Nickel Carbonate	3333-67-3	6.7E+02	n	8.1E+03	n	1.1E-02	c**	4.7E-02	c**	2.2E+02	n				
		2.6E-04	C	1.1E-02	C	1.4E-05	C	V		1			Nickel Carbonyl	13463-39-3	8.2E+02	n	1.1E+04	n	1.1E-02	c**	4.7E-02	c**	2.2E-02	c**				
		2.6E-04	C	1.1E-02	C	1.4E-05	C			0.04			Nickel Hydroxide	12054-48-7	8.2E+02	n	1.1E+04	n	1.1E-02	c**	4.7E-02	c**	2.0E+02	n				
		2.6E-04	C	1.1E-02	C	2.0E-05	C			0.04			Nickel Oxide	1313-99-1	8.4E+02	n	1.2E+04	n	1.1E-02	c**	4.7E-02	c**	2.0E+02	n				
		2.4E-04	I	1.1E-02	C	1.4E-05	C			0.04			Nickel Refinery Dust	E715532	8.2E+02	n	1.1E+04	n	1.2E-02	c**	5.1E-02	c**	2.2E+02	n		3.2E+01	n	
		2.6E-04	C	2.0E-02	I	1.4E-05	C			0.04			Nickel Soluble Salts	7440-02-0	1.4E+03	n	1.8E+04	n	1.1E-02	c**	4.7E-02	c**	3.9E+02	n		2.6E+01	n	
1.7E+00	C	4.8E-04	I	1.1E-02	C	1.4E-05	C			0.04			Nickel Subsulfide	12035-72-2	4.1E-01	c	1.9E+00	c	5.8E-03	c**	2.6E-02	c**	4.5E-02	c				
9.1E-01	C	2.6E-04	C	1.1E-02	C	1.4E-05	C			1	0.1		Nickelocene	1271-28-9	6.0E-01	c	2.5E+00	c	1.1E-02	c**	4.7E-02	c**	8.6E-02	c				
				1.6E+00	I					1			Nitrate (measured as nitrogen)	14797-55-8	1.3E+05	nm	1.9E+06	nm					3.2E+04	n	1.0E+04			
										1			Nitrate + Nitrite (measured as nitrogen)	E701177											1.0E+04			
				1.0E-01	I					1			Nitrite (measured as nitrogen)	14797-65-0	7.8E+03	n	1.2E+05	nm					2.0E+03	n	1.0E+03			
				1.0E-02	X	5.0E-05	X			1	0.1		Nitroaniline, 2-	88-74-4	6.3E+02	n	8.0E+03	n	5.2E-02	n	2.2E-01	n	1.9E+02	n		8.0E-02	n	
2.0E-02	P			4.0E-03	P	6.0E-03	P			1	0.1		Nitroaniline, 4-	100-01-6	2.7E+01	c**	1.1E+02	c*	6.3E+00	n	2.6E+01	n	3.8E+00	c*		1.6E-03	c*	
		4.0E-05	I	2.0E-03	I	9.0E-03	I	V		1		3.1E+03	Nitrobenzene	98-95-3	5.1E+00	c*	2.2E+01	c*	7.0E-02	c	3.1E-01	c	1.4E-01	c*		9.2E-05	c*	
				3.0E+03	P					1	0.1		Nitrocellulose	9004-70-0	1.9E+08	nm	2.5E+09	nm					6.0E+07	n		1.3E+04	n	
				7.0E-02	H					1	0.1		Nitrofurantoin	67-20-9	4.4E+03	n	5.7E+04	n					1.4E+03	n		6.1E-01	n	
1.3E+00	C	3.7E-04	C							1	0.1		Nitrofurazone	59-87-0	4.2E-01	c	1.8E+00	c	7.6E-03	c	3.3E-02	c	6.0E-02	c		5.4E-05	c	
1.7E-02	P			1.0E-04	P					1	0.1		Nitroglycerin	55-63-0	6.3E+00	n	8.2E+01	n					2.0E+00	n		8.5E-04	n	
				1.0E-01	I					1	0.1		Nitroguanidine	556-88-7	6.3E+03	n	8.2E+04	n					2.0E+03	n		4.8E-01	n	
		8.8E-06	P			5.0E-03	P	V		1		1.8E+04	Nitromethane	75-52-5	5.4E+00	c*	2.4E+01	c*	3.2E-01	c*	1.4E+00	c*	6.4E-01	c*		1.4E-04	c*	
		5.8E-04	X			2.0E-02	I	V		1		4.9E+03	Nitropropane, 2-	79-46-9	6.4E-02	c	2.8E-01	c	4.8E-03	c	2.1E-02	c	9.7E-03	c		2.5E-06	c	
2.7E+01	C	7.7E-03	C						M	1	0.1		Nitroso-N-ethylurea, N-	759-73-9	4.5E-03	c	8.5E-02	c	1.3E-04	c	1.6E-03	c	9.2E-04	c		2.2E-07	c	
1.2E+02	C	3.4E-02	C						M	1	0.1		Nitroso-N-methylurea, N-	684-93-5	1.0E-03	c	1.9E-02	c	3.0E-05	c	3.6E-04	c	2.1E-04	c		4.6E-08	c	
5.4E+00	I	1.6E-03	I					V		1			Nitroso-di-N-butylamine, N-	924-16-3	9.9E-02	c	4.6E-01	c	1.8E-03	c	7.7E-03	c	2.7E-03	c		5.5E-06	c	
7.0E+00	I	2.0E-03	C							1	0.1		Nitroso-di-N-propylamine, N-	621-64-7	7.8E-02	c	3.3E-01	c	1.4E-03	c	6.1E-03	c	1.1E-02	c		8.1E-06	c	
2.8E+00	I	8.0E-04	C							1	0.1		Nitrosodiethanolamine, N-	1116-54-7	1.9E-01	c	8.2E-01	c	3.5E-03	c	1.5E-02	c	2.8E-02	c		5.6E-06	c	
1.5E+02	I	4.3E-02	I						M	1	0.1		Nitrosodiethylamine, N-	55-18-5	8.1E-04	c	1.5E-02	c	2.4E-05	c	2.9E-04	c	1.7E-04	c		6.1E-08	c	
5.1E+01	I	1.4E-02	I	8.0E-06	P	4.0E-05	X	V	M	1		2.4E+05	Nitrosodimethylamine, N-	62-75-9	2.0E-03	c	3.4E-02	c	7.2E-05	c	8.8E-04	c	1.1E-04	c		2.7E-08	c	
4.9E-03	I	2.6E-06	C							1	0.1		Nitrosodiphenylamine, N-	86-30-6	1.1E+02	c	4.7E+02	c	1.1E+00	c	4.7E+00	c	1.2E+01	c		6.7E-02	c	
2.2E+01	I	6.3E-03	C					V		1		1.1E+05	Nitrosomethylethylamine, N-	10595-95-6	2.0E-02	c	9.1E-02	c	4.5E-04	c	1.9E-03	c	7.1E-04	c		2.0E-07	c	
6.7E+00	C	1.9E-03	C							1	0.1		Nitrosomorpholine [N-]	59-89-2	8.1E-02	c	3.4E-01	c	1.5E-03	c	6.5E-03	c	1.2E-02	c		2.8E-06	c	
9.4E+00	C	2.7E-03	C							1	0.1		Nitrosopiperidine [N-]	100-75-4	5.8E-02	c	2.4E-01	c	1.0E-03	c	4.5E-03	c	8.2E-03	c		4.4E-06	c	
2.1E+00	I	6.1E-04	I							1	0.1		Nitrosopyrrolidine, N-	930-55-2	2.6E-01	c	1.1E+00	c	4.6E-03	c	2.0E-02	c	3.7E-02	c		1.4E-05	c	
				1.0E-04	X					1	0.1		Nitrotoluene, m-	99-08-1	6.3E+00	n	8.2E+01	n					1.7E+00	n		1.6E-03	n	
2.2E-01	P			9.0E-04	P			V		1		1.5E+03	Nitrotoluene, o-	88-72-2	3.2E+00	c*	1.5E+01	c*					3.1E-01	c*		3.0E-04	c*	
1.6E-02	P			4.0E-03	P					1	0.1		Nitrotoluene, p-	99-99-0	3.4E+01	c**	1.4E+02	c*					4.3E+00	c*		4.0E-03	c*	
				3.0E-04	X	2.0E-02	P	V		1		6.9E+00	Nonane, n-	111-84-2	1.1E+01	ns	7.2E+01	ns	2.1E+01	n	8.8E+01	n	5.3E+00	n		7.5E-02	n	
				1.5E-03	O					1	0.1		Norflurazon	27314-13-2	9.5E+01	n	1.2E+03	n					2.9E+01	n		1.9E-01	n	
				3.0E-03	I					1	0.1		Octabromodiphenyl Ether	32536-52-0	1.9E+02	n	2.5E+03	n					6.0E+01	n		1.2E+01	n	
				5.0E-02	I					1	0.006		Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	2691-41-0	3.9E+03	n	5.7E+04	n					1.0E+03	n		1.3E+00	n	
				2.0E-03	H					1	0.1		Octamethylpyrophosphoramide	152-16-9	1.3E+02	n	1.6E+03	n					4.0E+01	n		9.6E-03	n	
7.8E-03	O			1.9E-01	O					1	0.1		Oryzalin	19044-88-3	7.0E+01	c	2.9E+02	c					7.9E+00	c		1.5E-02	c	
				5.0E-03	I					1	0.1		Oxadiazon	19666-30-9	3.2E+02	n	4.1E+03	n					4.7E+01	n		4.8E-01	n	
				2.5E-02	I					1	0.1		Oxamyl	23135-22-0	1.6E+03	n	2.1E+04	n					5.0E+02	n	2.0E+02	1.1E-01	n	4.4E-02
7.3E-02	O			4.0E-02	O					1	0.1		Oxyfluorfen	42874-03-3	7.4E+00	c	3.1E+01	c					5.4E-01	c		4.3E-02	c	
				1.3E-02	I					1	0.1		Paclobutrazol	76738-62-0	8.2E+02	n	1.1E+04	n					2.3E+02	n		4.6E-01	n	
				4.5E-03	I					1	0.1		Paraquat Dichloride	1910-42-5	2.8E+02	n	3.7E+03	n					9.0E+01	n		1.2E+00	n	
				6.0E-03	H					1	0.1		Parathion	56-38-2	3.8E+02	n	4.9E+03	n					8.6E+01	n		4.3E-01	n	
				5.0E-02	H			V		1			Pebulate	1114-71-2	3.9E+03	n	5.8E+04	n					5.6E+02	n		4.5E-01	n	
				3.0E-01	O					1	0.1		Pendimethalin	40487-42-1	1.9E+04	n	2.5E+05	nm					1.4E+03	n		1.6E+01	n	
				2.0E-03	I			V		1		3.1E-01	Pentabromodiphenyl Ether	32534-81-9	1.6E+02	ns	2.3E+03	ns					4.0E+01	n		1.7E+00	n	
				1.0E-04	I					1	0.1		Pentabromodiphenyl ether, 2,2',4,4',5- (BDE-99)	60348-60-9	6.3E+00	n	8.2E+01	n					2.0E+00	n		8.7E-02	n	
				8.0E-04	I			V		1			Pentachlorobenzene	608-93-5	6.3E+01	n	9.3E+02	n					3.2E+00	n		2.4E-02	n	
9.0E-02	P							V		1		4.6E+02	Pentachloroethane	76-01-7	7.7E+00	c	3.6E+01	c					6.5E-01	c		3.1E-04	c	
2.6E-01	H			3.0E-03	I			V		1			Pentachloronitrobenzene	82-68-8	2.7E+00	c*	1.3E+01	c					1.2E-01	c		1.5E-03	c	
4.0E-01	I	5.1E-06	C	5.0E-03	I					1	0.25		Pentachlorophenol	87-86-5	1.0E+00	c	4.0E+00	c	5.5E-01	c	2.4E+00	c	4.1E-02	c	1.0E+00	5.7E-05	c	1.4E-03
4.3E-03	X			9.0E-03	P					1	0.1		Pentaerythritol tetranitrate (PETN)	78-11-5	1.3E+02	c**	5.3E+02	c*					1.7E+01	c**		2.6E-02	c**	
				1.0E-04	X					1	0.1		Pentamethylphosphoramide (PMPA)	10159-46-3	6.3E+00	n	8.2E+01	n					2.0E+00	n		4.1E-04	n	
						1.0E+00	P	V		1		3.9E+02	Pentane, n-	109-66-0	8.1E+02	ns	3.4E+03	ns	1.0E+03	n	4.4E+03	n	2.1E+03	n		1.0E+01	n	
													Per- and Polyfluoroalkyl Substances (PFAS)															

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = OW; R = ORD; N = WI; W = TEF applied; E = RPF applied; G = see user's guide; c = cancer; n = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded; V = volatile; M = mutagen.

Toxicity and Chemical-specific Information													Contaminant		Screening Levels										Protection of Groundwater SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tap Water (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
				3.0E-06	D					1	0.1		~Ammonium perfluoro-2-methyl-3-oxahexanoate	62037-80-3	1.9E-01	n	2.5E+00	n					2.1E-02	n		2.2E-05	n	
				1.0E-03	I			V		1		2.7E+02	~Ammonium perfluorobutanoate	10495-86-0	7.8E+01	n	1.2E+03	ns					1.9E+01	n		6.8E-03	n	
				5.0E-04	I					1	0.1		~Ammonium perfluorohexanoate	21615-47-4	3.2E+01	n	4.1E+02	n					7.2E+00	n		1.7E-03	n	
				3.0E-04	R			V		1			~Bis(trifluoromethylsulfonyl)amine (TFSI)	82113-65-3	2.3E+01	n	3.5E+02	n					5.9E+00	n		1.9E-03	n	
				3.0E-06	D			V		1		1.9E+06	~Hexafluoropropylene oxide dimer acid (HFPO-DA)	13252-13-6	2.3E-01	n	3.5E+00	n					1.5E-02	n		1.5E-05	n	
				3.0E-04	R			V		1			~Lithium bis[(trifluoromethyl)sulfonyl]azanide	90076-65-6	2.3E+01	n	3.5E+02	n					6.0E+00	n		1.9E-03	n	
				3.0E-04	P					1	0.1		~Perfluorobutanesulfonate	45187-15-3	1.9E+01	n	2.5E+02	n					6.0E+00	n		3.0E-03	n	
				3.0E-04	P					1	0.1		~Perfluorobutanesulfonic acid (PFBS)	375-73-5	1.9E+01	n	2.5E+02	n					6.0E+00	n		3.0E-03	n	
				1.0E-03	I			V		1		2.6E+03	~Perfluorobutanoate	45048-62-2	7.8E+01	n	1.2E+03	n					1.8E+01	n		6.3E-03	n	
				1.0E-03	I			V		1		2.6E+03	~Perfluorobutanoic acid (PFBA)	375-22-4	7.8E+01	n	1.2E+03	n					1.8E+01	n		6.5E-03	n	
				5.0E-05	N					1	0.1		~Perfluorododecanoic acid (PFDoDA)	307-55-1	3.2E+00	n	4.1E+01	n					1.0E+00	n		1.7E-01	n	
				2.0E-05	A					1	0.1		~Perfluorohexanesulfonate	108427-53-8	1.3E+00	n	1.6E+01	n					3.9E-01	n		1.7E-04	n	
				2.0E-05	A					1	0.1		~Perfluorohexanesulfonic acid (PFHxS)	355-46-4	1.3E+00	n	1.6E+01	n					3.9E-01	n		1.7E-04	n	
				5.0E-04	I					1	0.1		~Perfluorohexanoate	92612-52-7	3.2E+01	n	4.1E+02	n					6.1E+00	n		1.5E-03	n	
				5.0E-04	I					1	0.1		~Perfluorohexanoic acid (PFHxA)	307-24-4	3.2E+01	n	4.1E+02	n					9.9E+00	n		2.4E-03	n	
				3.0E-06	A					1	0.1		~Perfluorononanoate	72007-68-2	1.9E-01	n	2.5E+00	n					5.9E-02	n		2.5E-04	n	
				3.0E-06	A					1	0.1		~Perfluorononanoic acid (PFNA)	375-95-1	1.9E-01	n	2.5E+00	n					5.9E-02	n		2.5E-04	n	
				4.0E-02	N					1	0.1		~Perfluorooctadecanoic acid (PFODA)	16517-11-6	2.5E+03	n	3.3E+04	n					8.0E+02	n		2.2E+02	n	
				2.0E-06	A					1	0.1		~Perfluorooctanesulfonate	45298-90-6	1.3E-01	n	1.6E+00	n					4.0E-02	n		3.1E-04	n	
				2.0E-06	A					1	0.1		~Perfluorooctanesulfonic acid (PFOS)	1763-23-1	1.3E-01	n	1.6E+00	n					4.0E-02	n		3.1E-04	n	
7.0E-02	D			3.0E-06	A					1	0.1		~Perfluorooctanoate	45285-51-6	1.9E-01	n	2.5E+00	n					6.0E-02	n		9.1E-04	n	
7.0E-02	D			3.0E-06	A					1	0.1		~Perfluorooctanoic acid (PFOA)	335-67-1	1.9E-01	n	2.5E+00	n					6.0E-02	n		9.1E-04	n	
				5.0E-04	R			V		1		1.4E+04	~Perfluoropropanoic acid (PFPrA)	422-64-0	3.9E+01	n	5.8E+02	n					9.8E+00	n		2.1E-03	n	
				1.0E-03	N					1	0.1		~Perfluorotetradecanoic acid (PFTetA)	376-06-7	6.3E+01	n	8.2E+02	n					2.0E+01	n		9.4E+00	n	
				3.0E-04	N					1	0.1		~Perfluoroundecanoic acid (PFUDA)	2058-94-8	1.9E+01	n	2.5E+02	n					6.0E+00	n		4.5E-02	n	
				2.0E-03	I			V		1		9.6E+04	~Potassium heptafluorobutanoate	2966-54-3	1.6E+02	n	2.3E+03	n					3.8E+01	n		1.3E-02	n	
				3.0E-04	P					1	0.1		~Potassium perfluorobutanesulfonate	29420-49-3	1.9E+01	n	2.5E+02	n					6.0E+00	n		3.0E-03	n	
				2.0E-06	A					1	0.1		~Potassium perfluorooctanesulfonate	2795-39-3	1.3E-01	n	1.6E+00	n					4.0E-02	n		3.1E-04	n	
				1.0E-03	I			V		1		9.0E+04	~Sodium perfluorobutanoate	2218-54-4	7.8E+01	n	1.2E+03	n					1.8E+01	n		6.4E-03	n	
				5.0E-04	I					1	0.1		~Sodium perfluorohexanoate	2923-26-4	3.2E+01	n	4.1E+02	n					1.0E+01	n		2.4E-03	n	
													Perchlorates															
				7.0E-04	I					1			~Ammonium Perchlorate	7790-98-9	5.5E+01	n	8.2E+02	n					1.4E+01	n				
				7.0E-04	I					1			~Lithium Perchlorate	7791-03-9	5.5E+01	n	8.2E+02	n					1.4E+01	n				
				7.0E-04	I					1			~Perchlorate and Perchlorate Salts	14797-73-0	5.5E+01	n	8.2E+02	n					1.4E+01	n	1.5E+01(G)			
				7.0E-04	I					1			~Potassium Perchlorate	7778-74-7	5.5E+01	n	8.2E+02	n					1.4E+01	n				
				7.0E-04	I					1			~Sodium Perchlorate	7601-89-0	5.5E+01	n	8.2E+02	n					1.4E+01	n				
				5.0E-02	I					1	0.1		Permethrin	52645-53-1	3.2E+03	n	4.1E+04	n					1.0E+03	n		2.4E+02	n	
2.2E-03	C	6.3E-07	C							1	0.1		Phenacetin	62-44-2	2.5E+02	c	1.0E+03	c	4.5E+00	c	1.9E+01	c	3.4E+01	c		9.7E-03	c	
				2.4E-01	O					1	0.1		Phenmedipham	13684-63-4	1.5E+04	n	2.0E+05	nm					3.8E+03	n		2.1E+01	n	
				3.0E-01	I	2.0E-01	C			1	0.1		Phenol	108-95-2	1.9E+04	n	2.5E+05	nm	2.1E+02	n	8.8E+02	n	5.8E+03	n		3.3E+00	n	
				4.0E-03	I					1	0.1		Phenol, 2-(1-methylethoxy)-, methylcarbamate	114-26-1	2.5E+02	n	3.3E+03	n					7.8E+01	n		2.5E-02	n	
				5.0E-04	X					1	0.1		Phenothiazine	92-84-2	3.2E+01	n	4.1E+02	n					4.3E+00	n		1.4E-02	n	
				2.0E-04	X			V		1		1.3E+02	Phenyl Isothiocyanate	103-72-0	1.6E+01	n	2.3E+02	ns					2.6E+00	n		1.7E-03	n	
				6.0E-03	I					1	0.1		Phenylenediamine, m-	108-45-2	3.8E+02	n	4.9E+03	n					1.2E+02	n		3.2E-02	n	
1.2E-01	P			4.0E-03	P					1	0.1		Phenylenediamine, o-	95-54-5	4.5E+00	c*	1.9E+01	c					6.5E-01	c		1.7E-04	c	
				1.0E-03	X					1	0.1		Phenylenediamine, p-	106-50-3	6.3E+01	n	8.2E+02	n					2.0E+01	n		5.4E-03	n	
1.9E-03	H									1	0.1		Phenylphenol, 2-	90-43-7	2.8E+02	c	1.2E+03	c					3.0E+01	c		4.1E-01	c	
				2.0E-04	H					1	0.1		Phorate	298-02-2	1.3E+01	n	1.6E+02	n					3.0E+00	n		3.4E-03	n	
						3.0E-04	I	V		1		1.6E+03	Phosgene	75-44-5	3.1E-01	n	1.3E+00	n	3.1E-01	n	1.3E+00	n	6.3E-01	n		1.6E-04	n	
				2.0E-02	I					1	0.1		Phosmet	732-11-6	1.3E+03	n	1.6E+04	n					3.7E+02	n		8.2E-02	n	
													Phosphates, Inorganic															
				2.9E+00	X					1			~Aluminum metaphosphate	13776-88-0	2.3E+05	nm	3.4E+06	nm					5.9E+04	n				
				3.0E-01	X					1			~Aluminum salts of inorganic phosphates	E524680405	2.3E+04	n	3.5E+05	nm					6.0E+03	n				
				1.0E+00	P					1			~Dipotassium phosphate	7758-11-4	7.8E+04	n	1.2E+06	nm					2.0E+04	n				
				1.0E+00	P					1			~Disodium phosphate	7558-79-4	7.8E+04	n	1.2E+06	nm					2.0E+04	n				
				3.5E+00	X					1			~Monoaluminum phosphate	13530-50-2	2.8E+05	nm	4.1E+06	nm					7.1E+04	n				
				1.0E+00	P					1			~Monopotassium phosphate	7778-77-0	7.8E+04	n	1.2E+06	nm					2.0E+04	n				
				1.0E+00	P					1			~Monosodium phosphate	7558-80-7	7.8E+04	n	1.2E+06	nm					2.0E+04	n				
				1.4E+00	X					1	0.1		~Phosphoric acid, aluminum salt (1:1) [aluminum phosphate]	7784-30-7	8.6E+04	n	1.1E+06	nm					2.7E+04	n				
				4.3E+00	X					1			~Phosphoric acid, aluminum sodium salt (1:X:X) [sodium aluminum phosphate acidic (acidic SALP)]	7785-88-8	3.3E+05	nm	5.0E+06	nm					8.5E+04	n				
				1.0E+00	P					1			~Polyphosphoric acid	8017-16-1	7.8E+04	n	1.2E+06	nm					2.0E+04	n				
				1.0E+00	P					1			~Potassium salts of inorganic phosphates	E524680403	7.8E+04	n	1.2E+06	nm					2.0E+04	n				
				1.0E+00	P					1			~Potassium tripolyphosphate	13845-36-8	7.8E+04	n	1.2E+06	nm					2.0E+04	n				
				5.0E+00	X					1			~Sodium aluminum phosphate (anhydrous)	10279-59-1	3.9E+05	nm	5.8E+06	nm					1.0E+05	n				
				3.5E+00	X					1			~Sodium aluminum phosphate (tetrahydrate)	10305-76-7	2.8E+05	nm	4.1E+06	nm					7.0E+04	n				
				1.0E+00	P					1			~Sodium hexametaphosphate	10124-56-8	7.8E+04	n	1.2E+06	nm					2.0E+04	n				
				1.0E+00	P					1			~Sodium polyphosphate	68915-31-1	7.8E+04	n	1.2E+06	nm					2.0E+04	n				
				1.0E+00	P					1			~Sodium pyrophosphate	7758-16-9	7.8E+04	n	1.2E+06	nm					2.0E+04	n				
				1.0E+00	P					1			~Sodium salts of inorganic phosphates	E524680404	7.8E+04	n	1.2E+06	nm					2.0E+04	n				
				1.0E+00	P					1			~Sodium trimetaphosphate	7785-84-4	7.8E+04	n	1.2E+06	nm					2.0E+04	n				
				1.0E+00	P					1			~Sodium tripolyphosphate	7758-29-4	7.8E+04	n	1.2E+06	nm					2.0E+04	n				
				1.0E+00	P					1			~Tetrapotassium phosphate	7320-34-5	7.8E+04	n	1.2E+06	nm					2.0E+04	n				
				1.0E+00	P					1			~Tetrasodium pyrophosphate	7722-88-5	7.8E+04	n	1.2E+06	nm					2.0E+04	n				
				3.3E+00	X					1			~Trialuminum sodium tetra decahydrogenoctaorthophosphate (dihydrate)	15136-87-5	2.5E+05	nm	3.8E+06	nm					6.5E+04	n				
				3.1E+00	X					1	0.1		~Triphosphoric acid, aluminum salt (1:1) [aluminum triphosphate]	13939-25-8	2.0E+05	nm	2.6E+06	nm					6.2E+04	n				
				1.0E+00	P					1			~Tripotassium phosphate	7778-53-2	7.8E+04	n	1.2E+06	nm					2.0E+04	n				
				1.0E+00	P					1			~Trisodium phosphate	7601-54-9	7.8E+04	n	1.2E+06	nm					2.0E+04	n				
				3.0E-04	I	3.0E-04	I	V		1			Phosphine	7803-51-2	2.3E+01	n	3.5E+02	n	3.1E-01	n	1.3E+00	n	5.7E-01	n				
				1.0E+00	P	1.0E-02	I			1			Phosphoric Acid	7664-38-2	7.8E+04	n	1.1E+06	nm	1.0E+01	n	4.4E+01	n	2.0E+04	n				
				2.0E-05	I			V		1			Phosphorus, White	7723-14-0	1.6E+00	n	2.3E+01	n					4.0E-01	n		1.5E-03	n	

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = OW; R = ORD; N = WI; W = TEF applied; E = RPF applied; G = see user's guide; c = cancer; n = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded; V = volatile; M = mutagen.

Toxicity and Chemical-specific Information													Contaminant		Screening Levels											Protection of Groundwater SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tap Water (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
													Phthalates															
1.4E-02	I	2.4E-06	C	2.0E-02	I					1	0.1		~Bis(2-ethylhexyl)phthalate	117-81-7	3.9E+01	c*	1.6E+02	c	1.2E+00	c	5.1E+00	c	5.6E+00	c*	6.0E+00	1.3E+00	c*	1.4E+00
1.9E-03	P			2.0E-01	I					1	0.1		~Butyl Benzyl Phthalate	85-68-7	2.9E+02	c*	1.2E+03	c					1.6E+01	c		2.4E-01	c	
				1.0E+00	I					1	0.1		~Butylphthalyl Butylglycolate	85-70-1	6.3E+04	n	8.2E+05	nm					1.3E+04	n		3.1E+02	n	
				1.0E-01	I					1	0.1		~Dibutyl Phthalate	84-74-2	6.3E+03	n	8.2E+04	n					9.0E+02	n		2.3E+00	n	
				8.0E-01	I					1	0.1		~Diethyl Phthalate	84-66-2	5.1E+04	n	6.6E+05	nm					1.5E+04	n		6.1E+00	n	
				1.0E-01	I			V		1			~Dimethylterephthalate	120-61-6	7.8E+03	n	1.2E+05	nm					1.9E+03	n		4.9E-01	n	
				1.0E-02	P					1	0.1		~Octyl Phthalate, di-N-	117-84-0	6.3E+02	n	8.2E+03	n					2.0E+02	n		5.7E+01	n	
				5.0E-01	X					1	0.1		~Phthalic Acid, p-	100-21-0	3.2E+04	n	4.1E+05	nm					9.4E+03	n		3.4E+00	n	
				2.0E+00	I	2.0E-02	C			1	0.1		~Phthalic Anhydride	85-44-9	1.3E+05	nm	1.6E+06	nm	2.1E+01	n	8.8E+01	n	3.9E+04	n		8.5E+00	n	
				7.0E-02	I					1	0.1		Picloram	1918-02-1	4.4E+03	n	5.7E+04	n					1.4E+03	n	5.0E+02	3.8E-01	n	1.4E-01
				1.0E-04	X					1	0.1		Picramic Acid (2-Amino-4,6-dinitrophenol)	96-91-3	6.3E+00	n	8.2E+01	n					2.0E+00	n		1.3E-03	n	
				2.0E-03	X					1	0.1		Picric Acid (2,4,6-Trinitrophenol)	88-89-1	1.3E+02	n	1.6E+03	n					4.0E+01	n		1.9E-01	n	
				7.3E-04	O					1	0.1		Pirimiphos, Methyl	29232-93-7	4.6E+01	n	6.0E+02	n					8.9E+00	n		8.4E-03	n	
3.0E+01	C	8.6E-03	C	7.0E-06	H					1	0.1		Polybrominated Biphenyls	36355-01-8	1.8E-02	c*	7.7E-02	c*	3.3E-04	c	1.4E-03	c	2.6E-03	c*				
													Polychlorinated Biphenyls (PCBs)															
7.0E-02	G	2.0E-05	G	7.0E-05	I			V		1	0.14		~Aroclor 1016	12674-11-2	4.1E+00	n	2.7E+01	c**	1.4E-01	c	6.1E-01	c	2.2E-01	c**		2.1E-02	c**	
2.0E+00	G	5.7E-04	G					V		1	0.14		~Aroclor 1221	11104-28-2	2.0E-01	c	8.3E-01	c	4.9E-03	c	2.1E-02	c	4.7E-03	c		8.0E-05	c	
2.0E+00	G	5.7E-04	G					V		1	0.14		~Aroclor 1232	11141-16-5	1.7E-01	c	7.2E-01	c	4.9E-03	c	2.1E-02	c	4.7E-03	c		8.0E-05	c	
2.0E+00	G	5.7E-04	G					V		1	0.14		~Aroclor 1242	53469-21-9	2.3E-01	c	9.5E-01	c	4.9E-03	c	2.1E-02	c	7.8E-03	c		1.2E-03	c	
2.0E+00	G	5.7E-04	G					V		1	0.14		~Aroclor 1248	12672-29-6	2.3E-01	c	9.4E-01	c	4.9E-03	c	2.1E-02	c	7.8E-03	c		1.2E-03	c	
2.0E+00	G	5.7E-04	G	2.0E-05	I			V		1	0.14		~Aroclor 1254	11097-69-1	2.4E-01	c**	9.7E-01	c*	4.9E-03	c	2.1E-02	c	7.8E-03	c*		2.0E-03	c*	
2.0E+00	G	5.7E-04	G					V		1	0.14		~Aroclor 1260	11096-82-5	2.4E-01	c	9.9E-01	c	4.9E-03	c	2.1E-02	c	7.8E-03	c		5.5E-03	c	
				6.0E-04	X			V		1	0.14		~Aroclor 5460	11126-42-4	3.5E+01	n	4.4E+02	n					1.2E+01	n		2.0E+00	n	
3.9E+00	W	1.1E-03	W	2.3E-05	W	1.3E-03	W	V		1	0.14		~Heptachlorobiphenyl, 2,3,3',4,4',5,5'- (PCB 189)	39635-31-9	1.3E-01	c*	5.2E-01	c*	2.5E-03	c	1.1E-02	c	4.0E-03	c		2.8E-03	c	
3.9E+00	W	1.1E-03	W	2.3E-05	W	1.3E-03	W	V		1	0.14		~Hexachlorobiphenyl, 2,3',4,4',5,5'- (PCB 167)	52663-72-6	1.2E-01	c*	5.1E-01	c*	2.5E-03	c	1.1E-02	c	4.0E-03	c		1.7E-03	c	
3.9E+00	W	1.1E-03	W	2.3E-05	W	1.3E-03	W	V		1	0.14		~Hexachlorobiphenyl, 2,3,3',4,4',5'- (PCB 157)	69782-90-7	1.2E-01	c*	5.0E-01	c*	2.5E-03	c	1.1E-02	c	4.0E-03	c		1.7E-03	c	
3.9E+00	W	1.1E-03	W	2.3E-05	W	1.3E-03	W	V		1	0.14		~Hexachlorobiphenyl, 2,3,3',4,4',5-' (PCB 156)	38380-08-4	1.2E-01	c*	5.0E-01	c*	2.5E-03	c	1.1E-02	c	4.0E-03	c		1.7E-03	c	
3.9E+03	W	1.1E+00	W	2.3E-08	W	1.3E-06	W	V		1	0.14		~Hexachlorobiphenyl, 3,3',4,4',5,5'- (PCB 169)	32774-16-6	1.2E-04	c*	5.1E-04	c*	2.5E-06	c	1.1E-05	c	4.0E-06	c		1.7E-06	c	
3.9E+00	W	1.1E-03	W	2.3E-05	W	1.3E-03	W	V		1	0.14		~Pentachlorobiphenyl, 2',3,4,4',5- (PCB 123)	65510-44-3	1.2E-01	c*	4.9E-01	c*	2.5E-03	c	1.1E-02	c	4.0E-03	c		1.0E-03	c	
3.9E+00	W	1.1E-03	W	2.3E-05	W	1.3E-03	W	V		1	0.14		~Pentachlorobiphenyl, 2,3',4,4',5- (PCB 118)	31508-00-6	1.2E-01	c*	4.9E-01	c*	2.5E-03	c	1.1E-02	c	4.0E-03	c		1.0E-03	c	
3.9E+00	W	1.1E-03	W	2.3E-05	W	1.3E-03	W	V		1	0.14		~Pentachlorobiphenyl, 2,3,3',4,4'- (PCB 105)	32598-14-4	1.2E-01	c*	4.9E-01	c*	2.5E-03	c	1.1E-02	c	4.0E-03	c		1.0E-03	c	
3.9E+00	W	1.1E-03	W	2.3E-05	W	1.3E-03	W	V		1	0.14		~Pentachlorobiphenyl, 2,3,4,4',5- (PCB 114)	74472-37-0	1.2E-01	c*	5.0E-01	c*	2.5E-03	c	1.1E-02	c	4.0E-03	c		1.0E-03	c	
1.3E+04	W	3.8E+00	W	7.0E-09	W	4.0E-07	W	V		1	0.14		~Pentachlorobiphenyl, 3,3',4,4',5- (PCB 126)	57465-28-8	3.6E-05	c*	1.5E-04	c*	7.4E-07	c	3.2E-06	c	1.2E-06	c		3.0E-07	c	
2.0E+00	I	5.7E-04	I					V		1	0.14		~Polychlorinated Biphenyls (high risk)	1336-36-3	2.3E-01	c	9.4E-01	c	4.9E-03	c	2.1E-02	c			5.0E-01			
4.0E-01	I	1.0E-04	I					V		1	0.14		~Polychlorinated Biphenyls (low risk)	1336-36-3					2.8E-02	c	1.2E-01	c	4.4E-02	c	5.0E-01	6.8E-03	c	7.8E-02
7.0E-02	I	2.0E-05	I					V		1	0.14		~Polychlorinated Biphenyls (lowest risk)	1336-36-3					1.4E-01	c	6.1E-01	c			5.0E-01			
1.3E+01	W	3.8E-03	W	7.0E-06	W	4.0E-04	W			1	0.14		~Tetrachlorobiphenyl, 3,3',4,4'- (PCB 77)	32598-13-3	3.8E-02	c*	1.6E-01	c*	7.4E-04	c	3.2E-03	c	6.0E-03	c*		9.4E-04	c*	
3.9E+01	W	1.1E-02	W	2.3E-06	W	1.3E-04	W	V		1	0.14		~Tetrachlorobiphenyl, 3,4,4',5- (PCB 81)	70362-50-4	1.2E-02	c*	4.8E-02	c*	2.5E-04	c	1.1E-03	c	4.0E-04	c		6.2E-05	c	
						6.0E-04	I			1	0.1		Polymeric Methylene Diphenyl Diisocyanate (PMDI)	9016-87-9	8.5E+05	nm	3.6E+06	nm	6.3E-01	n	2.6E+00	n						
													Polynuclear Aromatic Hydrocarbons (PAHs)															
				6.0E-02	I			V		1	0.13		~Acenaphthene	83-32-9	3.6E+03	n	4.5E+04	n					5.3E+02	n		5.5E+00	n	
				3.0E-01	I			V		1	0.13		~Anthracene	120-12-7	1.8E+04	n	2.3E+05	nm					1.8E+03	n		5.8E+01	n	
1.0E-01	E	6.0E-05	E					V	M	1	0.13		~Benz[a]anthracene	56-55-3	1.1E+00	c	2.1E+01	c	1.7E-02	c	2.0E-01	c	3.0E-02	c		1.1E-02	c	
				9.0E-05	X	2.0E-06	X			1	0.1		~Benzo(e)pyrene	192-97-2	5.7E+00	n	7.3E+01	n	2.1E-03	n	8.8E-03	n	1.8E+00	n		2.2E+00	n	
1.2E+00	C	1.1E-04	C							1	0.13		~Benzo(j)fluoranthene	205-82-3	4.2E-01	c	1.8E+00	c	2.6E-02	c	1.1E-01	c	6.5E-02	c		7.8E-02	c	
1.0E+00	I	6.0E-04	I	3.0E-04	I	2.0E-06	I		M	1	0.13		~Benzo[a]pyrene	50-32-8	1.1E-01	c	2.1E+00	c	1.7E-03	c**	8.8E-03	n	2.5E-02	c	2.0E-01	2.9E-02	c	2.4E-01
1.0E-01	E	6.0E-05	E						M	1	0.13		~Benzo[b]fluoranthene	205-99-2	1.1E+00	c	2.1E+01	c	1.7E-02	c	2.0E-01	c	2.5E-01	c		3.0E-01	c	
1.0E-02	E	6.0E-06	E						M	1	0.13		~Benzo[k]fluoranthene	207-08-9	1.1E+01	c	2.1E+02	c	1.7E-01	c	2.0E+00	c	2.5E+00	c		2.9E+00	c	
				8.0E-02	I			V		1	0.13		~Chloronaphthalene, Beta-	91-58-7	4.8E+03	n	6.0E+04	n					7.5E+02	n		3.9E+00	n	
1.0E-03	E	6.0E-07	E						M	1	0.13		~Chrysene	218-01-9	1.1E+02	c	2.1E+03	c	1.7E+00	c	2.0E+01	c	2.5E+01	c		9.0E+00	c	
1.0E+00	E	6.0E-04	E						M	1	0.13		~Dibenz[a,h]anthracene	53-70-3	1.1E-01	c	2.1E+00	c	1.7E-03	c	2.0E-02	c	2.5E-02	c		9.6E-02	c	
1.2E+01	C	1.1E-03	C							1	0.13		~Dibenzo(a,e)pyrene	192-65-4	4.2E-02	c	1.8E-01	c	2.6E-03	c	1.1E-02	c	6.5E-03	c		8.4E-02	c	
2.5E+02	C	7.1E-02	C						M	1	0.13		~Dimethylbenz(a)anthracene, 7,12-	57-97-6	4.6E-04	c	8.4E-03	c	1.4E-05	c	1.7E-04	c	1.0E-04	c		9.9E-05	c	
				4.0E-02	I					1	0.13		~Fluoranthene	206-44-0	2.4E+03	n	3.0E+04	n					8.0E+02	n		8.9E+01	n	
				4.0E-02	I			V		1	0.13		~Fluorene	86-73-7	2.4E+03	n	3.0E+04	n					2.9E+02	n		5.4E+00	n	
1.0E-01	E	6.0E-05	E						M	1	0.13		~Indeno[1,2,3-cd]pyrene	193-39-5	1.1E+00	c	2.1E+01	c	1.7E-02	c	2.0E-01	c	2.5E-01	c		9.8E-01	c	
2.9E-02	P			7.0E-02	A			V		1	0.13	3.9E+02	~Methylnaphthalene, 1-	90-12-0	1.8E+01	c	7.3E+01	c					1.1E+00	c		6.0E-03	c	
				4.0E-03	I			V		1	0.13		~Methylnaphthalene, 2-	91-57-6	2.4E+02	n	3.0E+03	n					3.6E+01	n		1.9E-01	n	
1.2E-01	C	3.4E-05	C	2.0E-02	I	3.0E-03	I	V		1	0.13		~Naphthalene	91-20-3	2.0E+00	c*	8.6E+00	c*	8.3E-02	c*	3.6E-01	c*	1.2E-01	c*		3.8E-04	c*	
1.2E+00	C	1.1E-04	C							1	0.13		~Nitropyrene, 4-	57835-92-4	4.2E-01	c	1.8E+00	c	2.6E-02	c	1.1E-01	c	1.9E-02	c		3.3E-03	c	
				9.0E-05	X	2.0E-06	X			1	0.13		~Perylene	198-55-0	5.4E+00	n	6.7E+01	n	2.1E-03	n	8.8E-03	n	1.8E+00	n		2.2E+00	n	
				3.0E-02	I			V		1	0.13		~Pyrene	129-00-0	1.8E+03	n	2.3E+04	n					1.2E+02	n		1.3E+01	n	
1.5E-01	I			9.0E-03	I					1	0.1		Prochloraz	67747-09-5	3.6E+00	c	1.5E+01	c					3.8E-01	c		1.9E-03	c	
				6.0E-03	H			V		1			Profluralin	26399-36-0	4.7E+02	n	7.0E+03	n					2.6E+01	n		1.6E+00	n	
				1.5E-02	I					1	0.1		Prometon	1610-18-0	9.5E+02	n	1.2E+04	n					2.5E+02	n		1.2E-01	n	
				4.0E-02	O					1	0.1		Prometryn	7287-19-6	2.5E+03	n	3.3E+04	n					6.0E+02	n		9.0E-01	n	
				7.5E-02	I					1	0.1		Pronamide	23950-58-5	4.7E+03	n	6.2E+04	n					1.2E+03	n		1.2E+00	n	
				1.3E-02	I					1	0.1		Propachlor	1918-16-7	8.2E+02	n	1.1E+04	n					2.5E+02	n		1.5E-01	n	
				5.0E-03	I					1	0.1		Propanil	709-98-8	3.2E+02	n	4.1E+03	n					8.2E+01	n		4.5E-02	n	
1.9E-01	O			4.0E-02	O					1	0.1		Propargite	2312-35-8	2.8E+00	c	1.2E+01	c					1.6E-01	c		1.1E-02	c	
				2.0E-03	I			V		1		1.1E+05	Propargyl Alcohol	107-19-7	1.6E+02	n	2.3E+03	n					4.0E+01	n		8.1E-03	n	
				2.0E-02	I					1	0.1		Propazine	139-40-2	1.3E+03	n	1.6E+04	n					3.4E+02	n		3.0E-01	n	
				2.0E-02	I					1	0.1		Propham	122-42-9	1.3E+03	n	1.6E+04	n					3.5E+02	n		2.2E-01	n	
				1.0E-01	O					1	0.1		Propiconazole	60207-90-1	6.3E+03	n	8.2E+04	n					1.6E+03	n		5.3E+00	n	
						8.0E-03	I	V		1		3.3E+04	Propionaldehyde	123-38-6	7.5E+01	n	3.1E+02	n	8.3E+00	n	3.5E+01	n	1.7E+01	n		3.4E-03	n	
				1.0E-01	X	1.0E+00	X	V		1		2.6E+02	Propyl benzene	103-65-1	3.8E+03	ns	2.4E+04	ns	1.0E+03	n	4.4E+03	n	6.6E+02	n		1.2E+00	n	
						3.0E+00	C	V		1		3.5E+02	Propylene	115-07-1	2.2E+03	ns	9.3E+03	ns	3.1E+03	n	1.3E+04	n	6.3E+03	n		6.0E+00	n	
				2.0E+01	P					1	0.1		Propylene Glycol	57-55-6	1.3E+06	nm	1.6E+07	nm					4.0E+05	n		8.1E+01	n	
						2.7E-04	A			1	0.1		Propylene Glycol Dinitrate	6423-43-4	3.9E+05	nm	1.6E+06	nm	2.8E-01	n	1.2E+00	n						

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = OW; R = ORD; N = WI; W = TEF applied; E = RPF applied; G = see user's guide; c = cancer; n = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded; V = volatile; M = mutagen.

Toxicity and Chemical-specific Information														Contaminant		Screening Levels										Protection of Groundwater SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tap Water (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
				7.0E-01	H	2.0E+00	I	V		1		1.1E+05	Propylene Glycol Monomethyl Ether	107-98-2	4.1E+04	n	3.7E+05	nms	2.1E+03	n	8.8E+03	n	3.2E+03	n		6.5E-01	n	
2.4E-01	I	3.7E-06	I			3.0E-02	I	V		1		7.8E+04	Propylene Oxide	75-56-9	2.1E+00	c	9.7E+00	c	7.6E-01	c*	3.3E+00	c*	2.7E-01	c		5.6E-05	c	
				1.0E-03	I			V		1		5.3E+05	Pyridine	110-86-1	7.8E+01	n	1.2E+03	n					2.0E+01	n		6.8E-03	n	
				5.0E-04	I					1	0.1		Quinalphos	13593-03-8	3.2E+01	n	4.1E+02	n					5.1E+00	n		4.3E-02	n	
3.0E+00	I									1	0.1		Quinoline	91-22-5	1.8E-01	c	7.7E-01	c					2.4E-02	c		7.8E-05	c	
				9.0E-03	I					1	0.1		Quizalofop-ethyl	76578-14-8	5.7E+02	n	7.4E+03	n					1.2E+02	n		1.9E+00	n	
						3.0E+04	A			1			Refractory Ceramic Fibers (units in fibers)	E715557					3.1E+04	G	1.3E+05	G						
				3.0E-02	I					1	0.1		Resmethrin	10453-86-8	1.9E+03	n	2.5E+04	n					6.7E+01	n		4.2E+01	n	
				5.0E-02	H			V		1			Ronnel	299-84-3	3.9E+03	n	5.8E+04	n					4.1E+02	n		3.7E+00	n	
				4.0E-03	I					1	0.1		Rotenone	83-79-4	2.5E+02	n	3.3E+03	n					6.1E+01	n		3.2E+01	n	
2.2E-01	C	6.3E-05	C						M	1	0.1		Safrole	94-59-7	5.5E-01	c	1.0E+01	c	1.6E-02	c	1.9E-01	c	9.6E-02	c		5.9E-05	c	
				5.0E-03	I					1			Selenious Acid	7783-00-8	3.9E+02	n	5.8E+03	n					1.0E+02	n				
				5.0E-03	I	2.0E-02	C			1			Selenium	7782-49-2	3.9E+02	n	5.8E+03	n	2.1E+01	n	8.8E+01	n	1.0E+02	n	5.0E+01	5.2E-01	n	2.6E-01
				5.0E-03	C	2.0E-02	C			1			Selenium Sulfide	7446-34-6	3.9E+02	n	5.8E+03	n	2.1E+01	n	8.8E+01	n	1.0E+02	n				
				1.4E-01	O					1	0.1		Sethoxydim	74051-80-2	8.8E+03	n	1.1E+05	nm					1.6E+03	n		1.4E+01	n	
						3.0E-03	C			1			Silica (crystalline, respirable)	7631-86-9	4.3E+06	nm	1.8E+07	nm	3.1E+00	n	1.3E+01	n						
				5.0E-03	I					0.04			Silver	7440-22-4	3.9E+02	n	5.8E+03	n					9.4E+01	n		8.0E-01	n	
1.2E-01	H			5.0E-03	I					1	0.1		Simazine	122-34-9	4.5E+00	c*	1.9E+01	c					6.1E-01	c	4.0E+00	3.0E-04	c	2.0E-03
				1.3E-02	I					1	0.1		Sodium Acifluorfen	62476-59-9	8.2E+02	n	1.1E+04	n					2.6E+02	n		2.1E+00	n	
				4.0E-03	I					1			Sodium Azide	26628-22-8	3.1E+02	n	4.7E+03	n					8.0E+01	n				
2.7E-01	H			3.0E-02	I					1	0.1		Sodium Diethyldithiocarbamate	148-18-5	2.0E+00	c	8.5E+00	c					2.9E-01	c		1.8E-04	c	
				5.0E-02	A	1.4E-02	C			1			Sodium Fluoride	7681-49-4	3.9E+03	n	5.8E+04	n	1.5E+01	n	6.1E+01	n	1.0E+03	n	4.0E+03	1.5E+02	n	6.0E+02
				2.0E-05	I					1	0.1		Sodium Fluoroacetate	62-74-8	1.3E+00	n	1.6E+01	n					4.0E-01	n		8.1E-05	n	
				1.0E-03	H					1			Sodium Metavanadate	13718-26-8	7.8E+01	n	1.2E+03	n					2.0E+01	n				
				8.0E-04	P					1			Sodium Tungstate	13472-45-2	6.3E+01	n	9.3E+02	n					1.6E+01	n				
				8.0E-04	P					1			Sodium Tungstate Dihydrate	10213-10-2	6.3E+01	n	9.3E+02	n					1.6E+01	n				
2.4E-02	H			3.0E-02	I					1	0.1		Stirofos (Tetrachlorovinphos)	961-11-5	2.3E+01	c*	9.6E+01	c					2.8E+00	c		8.2E-03	c	
				6.0E-01	I					1			Strontium, Stable	7440-24-6	4.7E+04	n	7.0E+05	nm					1.2E+04	n		4.2E+02	n	
				3.0E-04	I					1	0.1		Strychnine	57-24-9	1.9E+01	n	2.5E+02	n					5.9E+00	n		6.5E-02	n	
				2.0E-01	I	1.0E+00	I	V		1		8.7E+02	Styrene	100-42-5	6.0E+03	ns	3.5E+04	ns	1.0E+03	n	4.4E+03	n	1.2E+03	n	1.0E+02	1.3E+00	n	1.1E-01
				3.0E-03	P					1	0.1		Styrene-Acrylonitrile (SAN) Trimer (THNA isomer)	57964-39-3	1.9E+02	n	2.5E+03	n					4.8E+01	n				
				3.0E-03	P					1	0.1		Styrene-Acrylonitrile (SAN) Trimer (THNP isomer)	57964-40-6	1.9E+02	n	2.5E+03	n					4.8E+01	n				
				1.0E-03	P	2.0E-03	X			1	0.1		Sulfolane	126-33-0	6.3E+01	n	8.2E+02	n	2.1E+00	n	8.8E+00	n	2.0E+01	n		4.4E-03	n	
				8.0E-04	P					1	0.1		Sulfonylbis(4-chlorobenzene), 1,1'-	80-07-9	5.1E+01	n	6.6E+02	n					1.1E+01	n		6.5E-02	n	
						1.0E-03	C	V		1			Sulfur Trioxide	7446-11-9	1.4E+06	nm	6.0E+06	nm	1.0E+00	n	4.4E+00	n	2.1E+00	n				
						1.0E-03	C			1			Sulfuric Acid	7664-93-9	1.4E+06	nm	6.0E+06	nm	1.0E+00	n	4.4E+00	n						
2.5E-02	I	7.1E-06	I	5.0E-02	H					1	0.1		Sulfurous acid, 2-chloroethyl 2-[4-(1,1-dimethylethyl)phenoxy]-1-methylethyl ester	140-57-8	2.2E+01	c	9.2E+01	c	4.0E-01	c	1.7E+00	c	1.3E+00	c		1.5E-02	c	
				7.0E-02	I					1	0.1		Tebuthiuron	34014-18-1	4.4E+03	n	5.7E+04	n					1.4E+03	n		3.9E-01	n	
				2.0E-02	H					1	0.1		Temephos	3383-96-8	1.3E+03	n	1.6E+04	n					4.0E+02	n		7.6E+01	n	
				1.3E-02	I					1	0.1		Terbacil	5902-51-2	8.2E+02	n	1.1E+04	n					2.5E+02	n		7.5E-02	n	
				2.5E-05	H			V		1		3.1E+01	Terbufos	13071-79-9	2.0E+00	n	2.9E+01	n					2.4E-01	n		5.2E-04	n	
				1.0E-03	I					1	0.1		Terbutryn	886-50-0	6.3E+01	n	8.2E+02	n					1.3E+01	n		1.9E-02	n	
5.0E-03	C	1.3E-06	C					V		1			Tert-Butyl Acetate	540-88-5	8.1E+00	c	3.6E+01	c	2.2E+00	c	9.4E+00	c	3.3E+00	c		7.6E-04	c	
				1.0E-04	I					1	0.1		Tetrabromodiphenyl ether, 2,2',4,4'- (BDE-47)	5436-43-1	6.3E+00	n	8.2E+01	n					2.0E+00	n		5.3E-02	n	
				3.0E-05	P			V		1			Tetrachlorobenzene, 1,2,4,5-	95-94-3	2.3E+00	n	3.5E+01	n					1.7E-01	n		7.9E-04	n	
2.6E-02	I	7.4E-06	I	3.0E-02	I			V		1		6.8E+02	Tetrachloroethane, 1,1,1,2-	630-20-6	2.0E+00	c	8.8E+00	c	3.8E-01	c	1.7E+00	c	5.7E-01	c		2.2E-04	c	
2.0E-01	I	5.8E-05	C	2.0E-02	I			V		1		1.9E+03	Tetrachloroethane, 1,1,2,2-	79-34-5	6.0E-01	c	2.7E+00	c	4.8E-02	c	2.1E-01	c	7.6E-02	c		3.0E-05	c	
2.1E-03	I	2.6E-07	I	6.0E-03	I	4.0E-02	I	V		1		1.7E+02	Tetrachloroethylene	127-18-4	2.4E+01	c**	1.0E+02	c**	1.1E+01	c**	4.7E+01	c**	1.1E+01	c**	5.0E+00	5.1E-03	c**	2.3E-03
				3.0E-02	I					1	0.1		Tetrachlorophenol, 2,3,4,6-	58-90-2	1.9E+03	n	2.5E+04	n					2.4E+02	n		1.8E-01	n	
1.6E+01	X			6.0E-05	X			V		1			Tetrachlorotoluene, p- alpha, alpha, alpha-	5216-25-1	4.3E-02	c	2.0E-01	c					1.7E-03	c		5.7E-06	c	
				5.0E-04	I					1	0.1		Tetraethyl Dithiopyrophosphate	3689-24-5	3.2E+01	n	4.1E+02	n					7.1E+00	n		5.2E-03	n	
						8.0E+01	I	V		1		2.1E+03	Tetrafluoroethane, 1,1,1,2-	811-97-2	1.0E+05	nms	4.3E+05	nms	8.3E+04	n	3.5E+05	n	1.7E+05	n		9.3E+01	n	
				1.0E-04	X					1	0.1		Tetramethylphosphoramide, -N,N,N',N" (TMPA)	16853-36-4	6.3E+00	n	8.2E+01	n					2.0E+00	n				
				2.0E-03	P					1	0.00065		Tetryl (Trinitrophenylmethylnitramine)	479-45-8	1.6E+02	n	2.3E+03	n					3.9E+01	n		3.7E-01	n	
				2.0E-05	G					1			Thallic Oxide	1314-32-5	1.6E+00	n	2.3E+01	n					4.0E-01	n				
				1.0E-05	X					1			Thallium (I) Nitrate	10102-45-1	7.8E-01	n	1.2E+01	n					2.0E-01	n				
				1.0E-05	X					1			Thallium (Soluble Salts)	7440-28-0	7.8E-01	n	1.2E+01	n					2.0E-01	n	2.0E+00	1.4E-02	n	1.4E-01
				1.0E-05	X			V		1			Thallium Acetate	563-68-8	7.8E-01	n	1.2E+01	n					2.0E-01	n		4.1E-05	n	
				2.0E-05	X					1	0.1		Thallium Carbonate	6533-73-9	1.3E+00	n	1.6E+01	n					4.0E-01	n		8.3E-05	n	
				1.0E-05	X					1			Thallium Chloride	7791-12-0	7.8E-01	n	1.2E+01	n					2.0E-01	n				
				1.0E-05	G					1			Thallium Selenite	12039-52-0	7.8E-01	n	1.2E+01	n					2.0E-01	n				
				2.0E-05	X					1			Thallium Sulfate	7446-18-6	1.6E+00	n	2.3E+01	n					4.0E-01	n				
				4.3E-02	O					1	0.1		Thifensulfuron-methyl	79277-27-3	2.7E+03	n	3.5E+04	n					8.6E+02	n		2.6E-01	n	
				1.0E-02	I					1	0.1		Thiobencarb	28249-77-6	6.3E+02	n	8.2E+03	n					1.6E+02	n		5.5E-01	n	
				3.0E-02	H					1	0.1		Thiocyanic acid, (2-benzothiazolylthio)methyl ester (TCMTB)	21564-17-0	1.9E+03	n	2.5E+04	n					4.8E+02	n		3.3E+00	n	
				7.0E-02	X					1	0.0075		Thiodiglycol	111-48-8	5.4E+03	n	7.9E+04	n					1.4E+03	n		2.8E-01	n	
				3.0E-04	H					1	0.1		Thiofanox	39196-18-4	1.9E+01	n	2.5E+02	n					5.3E+00	n		1.8E-03	n	
1.2E-02	O			1.6E-01	O					1	0.1		Thiophanate, Methyl	23564-05-8	4.7E+01	c	2.0E+02	c					6.7E+00	c		5.7E-03	c	
				1.5E-02	O					1	0.1		Thiram	137-26-8	9.5E+02	n	1.2E+04	n					2.9E+02	n		4.2E-01	n	
				6.0E-01	H					1			Tin	7440-31-5	4.7E+04	n	7.0E+05	nm					1.2E+04	n		3.0E+03	n	
						1.0E-04	A	V		1			Titanium Tetrachloride	7550-45-0	1.4E+05	nm	6.0E+05	nm	1.0E-01	n	4.4E-01	n	2.1E-01	n				
				8.0E-02	I	5.0E+00	I	V		1		8.2E+02	Toluene	108-88-3	4.9E+03	ns	4.7E+04	ns	5.2E+03	n	2.2E+04	n	1.1E+03	n	1.0E+03	7.6E-01	n	6.9E-01
3.9E-02	C	1.1E-05	C			8.0E-06	C	V		1			Toluene-2,4-diisocyanate	584-84-9	6.4E+00	n	2.7E+01	n	8.3E-03	n	3.5E-02	n	1.7E-02	n		2.5E-04	n	
3.9E-02	C	1.1E-05	C			8.0E-06	C	V		1		1.7E+03	Toluene-2,6-diisocyanate	91-08-7	5.3E+00	n	2.2E+01	n	8.3E-03	n	3.5E-02	n	1.7E-02	n		2.6E-04	n	
				1.0E-04	X					1	0.1		Toluenediamine, 2,3-	2687-25-4	6.3E+00	n	8.2E+01	n					2.0E+00	n		6.2E-04	n	
1.8E-01	X			2.0E-04	X					1	0.1		Toluenediamine, 2,5-	95-70-5	3.0E+00	c**	1.3E+01	c*					4.3E-01	c**		1.3E-04	c**	
				1.0E-04	X					1	0.1		Toluenediamine, 3,4-	496-72-0	6.3E+00	n	8.2E+01	n					2.0E+00	n		6.2E-04	n	
				5.0E-03	P					1	0.1		Toluic Acid, p-	99-94-5	3.2E+02	n	4.1E+03	n					9.0E+01	n		2.3E-02	n	
1.6E-02	P	5.1E-05	C							1	0.1		Toluidine, o- (Methylaniline, 2-)	95-53-4	3.4E+01	c	1.4E+02	c	5.5E-02	c	2.4E-01	c	4.7E+00	c		2.0E-03	c	
3.0E-02	P			4.0E-03	X					1	0.1		Toluidine, p-	106-49-0	1.8E+01	c*	7.7E+01	c*					2.5E+00	c*		1.1E-03	c*	

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = OW; R = ORD; N = WI; W = TEF applied; E = RPF applied; G = see user's guide; c = cancer; n = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded; V = volatile; M = mutagen.

Toxicity and Chemical-specific Information													Contaminant		Screening Levels										Protection of Groundwater SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tap Water (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
				3.0E+00	P			V		1		3.4E-01	Total Petroleum Hydrocarbons (Aliphatic High)	E1790670	2.3E+05	nms	3.5E+06	nms					6.0E+04	n		2.4E+03	n	
				5.0E-03	P	4.0E-01	P	V		1		1.1E+02	Total Petroleum Hydrocarbons (Aliphatic Low)	E1790666	2.5E+02	ns	1.9E+03	ns	4.2E+02	n	1.8E+03	n	2.8E+01	n		2.0E-02	n	
				1.0E-02	X	1.0E-01	P	V		1		6.9E+00	Total Petroleum Hydrocarbons (Aliphatic Medium)	E1790668	9.6E+01	ns	4.4E+02	ns	1.0E+02	n	4.4E+02	n	1.0E+02	n		1.5E+00	n	
				3.0E-04	P	2.0E-06	P		M	1	0.13		Total Petroleum Hydrocarbons (Aromatic High)	E1790676	1.8E+01	n	2.2E+02	n	2.1E-03	n	8.8E-03	n	6.0E+00	n		7.1E+00	n	
				1.0E-02	P	6.0E-02	P	V		1		2.3E+02	Total Petroleum Hydrocarbons (Aromatic Medium)	E1790674	3.0E+02	ns	1.7E+03	ns	6.3E+01	n	2.6E+02	n	5.7E+01	n		8.3E-02	n	
1.1E+00	I	3.2E-04	I	9.0E-05	P					1	0.1		Toxaphene	8001-35-2	4.9E-01	c*	2.1E+00	c*	8.8E-03	c	3.8E-02	c	7.1E-02	c*	3.0E+00	1.1E-02	c*	4.6E-01
				3.0E-05	X					1	0.1		Toxaphene, Weathered	E1841606	1.9E+00	n	2.5E+01	n					6.0E-01	n		9.3E-02	n	
				7.5E-03	I					1	0.1		Tralomethrin	66841-25-6	4.7E+02	n	6.2E+03	n					1.5E+02	n		5.8E+01	n	
				3.0E-04	A			V		1			Tri-n-butyltin	688-73-3	2.3E+01	n	3.5E+02	n					3.7E+00	n		8.2E-02	n	
				8.0E+01	X					1	0.1		Triacetin	102-76-1	5.1E+06	nm	6.6E+07	nm					1.6E+06	n		4.5E+02	n	
				3.4E-02	O					1	0.1		Triadimefon	43121-43-3	2.1E+03	n	2.8E+04	n					6.3E+02	n		5.0E-01	n	
7.2E-02	O			2.5E-02	O			V		1			Triallate	2303-17-5	9.7E+00	c	4.6E+01	c					4.7E-01	c		1.0E-03	c	
				1.0E-02	I					1	0.1		Triasulfuron	82097-50-5	6.3E+02	n	8.2E+03	n					2.0E+02	n		2.1E-01	n	
				8.0E-03	I					1	0.1		Tribenuron-methyl	101200-48-0	5.1E+02	n	6.6E+03	n					1.6E+02	n		6.1E-02	n	
				5.0E-03	I			V		1			Tribromobenzene, 1,2,4-	615-54-3	3.9E+02	n	5.8E+03	n					4.5E+01	n		6.4E-02	n	
				9.0E-03	X					1	0.1		Tribromophenol, 2,4,6-	118-79-6	5.7E+02	n	7.4E+03	n					1.2E+02	n		2.2E-01	n	
				2.0E-04	O					1	0.1		Tribufos	78-48-8	1.3E+01	n	1.6E+02	n					5.7E-01	n		2.8E-03	n	
9.0E-03	P			1.0E-02	P					1	0.1		Tributyl Phosphate	126-73-8	6.0E+01	c*	2.6E+02	c*					5.2E+00	c*		2.5E-02	c*	
				3.0E-04	P					1	0.1		Tributyltin Compounds	E1790679	1.9E+01	n	2.5E+02	n					6.0E+00	n				
				3.0E-04	I					1	0.1		Tributyltin Oxide	56-35-9	1.9E+01	n	2.5E+02	n					5.7E+00	n		2.9E+02	n	
										1	0.1		Trichloramine	10025-85-1											4.0E+03(G)			
				3.0E+01	I	5.0E+00	P	V		1		9.1E+02	Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	6.7E+03	ns	2.8E+04	ns	5.2E+03	n	2.2E+04	n	1.0E+04	n		2.6E+01	n	
7.0E-02	I			2.0E-02	I					1	0.1		Trichloroacetic Acid	76-03-9	7.8E+00	c	3.3E+01	c					1.1E+00	c	6.0E+01(G)	2.2E-04	c	1.2E-02
2.9E-02	H									1	0.1		Trichloroaniline HCl, 2,4,6-	33663-50-2	1.9E+01	c	7.9E+01	c					2.7E+00	c		7.4E-03	c	
7.0E-03	X			3.0E-05	X					1	0.1		Trichloroaniline, 2,4,6-	634-93-5	1.9E+00	n	2.5E+01	n					4.0E-01	n		3.6E-03	n	
				8.0E-04	X			V		1			Trichlorobenzene, 1,2,3-	87-61-6	6.3E+01	n	9.3E+02	n					7.0E+00	n		2.1E-02	n	
2.9E-02	P			1.0E-02	I	2.0E-03	P	V		1		4.0E+02	Trichlorobenzene, 1,2,4-	120-82-1	2.4E+01	c**	1.1E+02	c**	2.1E+00	n	8.8E+00	n	1.2E+00	c**	7.0E+01	3.4E-03	c**	2.0E-01
				2.0E+00	I	5.0E+00	I	V		1		6.4E+02	Trichloroethane, 1,1,1-	71-55-6	8.1E+03	ns	3.6E+04	ns	5.2E+03	n	2.2E+04	n	8.0E+03	n	2.0E+02	2.8E+00	n	7.0E-02
5.7E-02	I	1.6E-05	I	4.0E-03	I	2.0E-04	X	V		1		2.2E+03	Trichloroethane, 1,1,2-	79-00-5	1.1E+00	c**	5.0E+00	c**	1.8E-01	c**	7.7E-01	c**	2.8E-01	c**	5.0E+00	8.9E-05	c**	1.6E-03
4.6E-02	I	4.1E-06	I	5.0E-04	I	2.0E-03	I	V	M	1		6.9E+02	Trichloroethylene	79-01-6	9.4E-01	c**	6.0E+00	c**	4.8E-01	c**	3.0E+00	c**	4.9E-01	c**	5.0E+00	1.8E-04	c**	1.8E-03
				3.0E-01	I			V		1		1.2E+03	Trichlorofluoromethane	75-69-4	2.3E+04	ns	3.5E+05	nms					5.2E+03	n		3.3E+00	n	
				1.0E-01	I					1	0.1		Trichlorophenol, 2,4,5-	95-95-4	6.3E+03	n	8.2E+04	n					1.2E+03	n		4.0E+00	n	
1.1E-02	I	3.1E-06	I	1.0E-03	P					1	0.1		Trichlorophenol, 2,4,6-	88-06-2	4.9E+01	c**	2.1E+02	c**	9.1E-01	c	4.0E+00	c	4.1E+00	c**		4.0E-03	c**	
				1.0E-02	I					1	0.1		Trichlorophenoxyacetic Acid, 2,4,5-	93-76-5	6.3E+02	n	8.2E+03	n					1.6E+02	n		6.8E-02	n	
				8.0E-03	I					1	0.1		Trichlorophenoxypropionic acid, -2,4,5	93-72-1	5.1E+02	n	6.6E+03	n					1.1E+02	n	5.0E+01	6.1E-02	n	2.8E-02
				5.0E-03	I			V		1		1.3E+03	Trichloropropane, 1,1,2-	598-77-6	3.9E+02	n	5.8E+03	ns					8.8E+01	n		3.5E-02	n	
3.0E+01	I			4.0E-03	I	3.0E-04	I	V	M	1		1.4E+03	Trichloropropane, 1,2,3-	96-18-4	5.1E-03	c	1.1E-01	c	3.1E-01	n	1.3E+00	n	7.5E-04	c		3.2E-07	c	
				3.0E-03	X	3.0E-04	P	V		1		3.1E+02	Trichloropropene, 1,2,3-	96-19-5	7.3E-01	n	3.1E+00	n	3.1E-01	n	1.3E+00	n	6.2E-01	n		3.1E-04	n	
				2.0E-02	A					1	0.1		Tricresyl Phosphate (TCP)	1330-78-5	1.3E+03	n	1.6E+04	n					1.6E+02	n		1.5E+01	n	
				3.0E-03	I					1	0.1		Tridiphane	58138-08-2	1.9E+02	n	2.5E+03	n					1.8E+01	n		1.3E-01	n	
						7.0E-03	I	V		1		2.8E+04	Triethylamine	121-44-8	1.2E+02	n	4.8E+02	n	7.3E+00	n	3.1E+01	n	1.5E+01	n		4.4E-03	n	
				2.0E+00	P					1	0.1		Triethylene Glycol	112-27-6	1.3E+05	nm	1.6E+06	nm					4.0E+04	n		8.8E+00	n	
						2.0E+01	P	V		1		4.8E+03	Trifluoroethane, 1,1,1-	420-46-2	1.5E+04	ns	6.2E+04	ns	2.1E+04	n	8.8E+04	n	4.2E+04	n		1.3E+02	n	
7.7E-03	I			7.5E-03	I			V		1			Trifluralin	1582-09-8	9.0E+01	c**	4.2E+02	c*					2.6E+00	c*		8.4E-02	c*	
2.0E-02	P			1.0E-02	P					1	0.1		Trimethyl Phosphate	512-56-1	2.7E+01	c*	1.1E+02	c*					3.9E+00	c*		8.6E-04	c*	
				1.0E-02	I	6.0E-02	I	V		1		2.9E+02	Trimethylbenzene, 1,2,3-	526-73-8	3.4E+02	ns	2.0E+03	ns	6.3E+01	n	2.6E+02	n	5.5E+01	n		8.1E-02	n	
				1.0E-02	I	6.0E-02	I	V		1		2.2E+02	Trimethylbenzene, 1,2,4-	95-63-6	3.0E+02	ns	1.8E+03	ns	6.3E+01	n	2.6E+02	n	5.6E+01	n		8.1E-02	n	
				1.0E-02	I	6.0E-02	I	V		1		1.8E+02	Trimethylbenzene, 1,3,5-	108-67-8	2.7E+02	ns	1.5E+03	ns	6.3E+01	n	2.6E+02	n	6.0E+01	n		8.7E-02	n	
				1.0E-02	X			V		1		3.0E+01	Trimethylpentene, 2,4,4-	25167-70-8	7.8E+02	ns	1.2E+04	ns					3.8E+01	n		1.3E-01	n	
				3.0E-02	I					1	0.019		Trinitrobenzene, 1,3,5-	99-35-4	2.2E+03	n	3.2E+04	n					5.9E+02	n		2.1E+00	n	
3.0E-02	I			5.0E-04	I					1	0.032		Trinitrotoluene, 2,4,6-	118-96-7	2.1E+01	c**	9.6E+01	c**					2.5E+00	c**		1.5E-02	c**	
				2.0E-02	P					1	0.1		Triphenylphosphine Oxide	791-28-6	1.3E+03	n	1.6E+04	n					3.6E+02	n		1.5E+00	n	
				2.0E-02	A					1	0.1		Tris(1,3-Dichloro-2-propyl) Phosphate	13674-87-8	1.3E+03	n	1.6E+04	n					3.6E+02	n		8.0E+00	n	
				1.0E-02	X					1	0.1		Tris(1-chloro-2-propyl)phosphate	13674-84-5	6.3E+02	n	8.2E+03	n					1.9E+02	n		6.5E-01	n	
2.3E+00	C	6.6E-04	C					V		1		4.7E+02	Tris(2,3-dibromopropyl)phosphate	126-72-7	2.8E-01	c	1.3E+00	c	4.3E-03	c	1.9E-02	c	6.8E-03	c		1.3E-04	c	
2.0E-02	P			7.0E-03	P					1	0.1		Tris(2-chloroethyl)phosphate	115-96-8	2.7E+01	c*	1.1E+02	c*					3.8E+00	c*		3.8E-03	c*	
3.2E-03	P			1.0E-01	P					1	0.1		Tris(2-ethylhexyl)phosphate	78-42-2	1.7E+02	c*	7.2E+02	c					2.4E+01	c*		1.2E+02	c*	
				8.0E-04	P					1			Tungsten	7440-33-7	6.3E+01	n	9.3E+02	n					1.6E+01	n		2.4E+00	n	
				2.0E-04	A	4.0E-05	A			1			Uranium	7440-61-1	1.6E+01	n	2.3E+02	n	4.2E-02	n	1.8E-01	n	4.0E+00	n	3.0E+01	1.8E+00	n	1.4E+01
1.0E+00	C	2.9E-04	C						M	1	0.1		Urethane	51-79-6	1.2E-01	c	2.3E+00	c	3.5E-03	c	4.2E-02	c	2.5E-02	c		5.6E-06	c	
		8.3E-03	P	9.0E-03	I	7.0E-06	P			0.026			Vanadium Pentoxide	1314-62-1	4.6E+02	c**	2.0E+03	c**	3.4E-04	c*	1.5E-03	c*	1.5E+02	n				
				5.0E-03	G	1.0E-04	A			0.026			Vanadium and Compounds	7440-62-2	3.9E+02	n	5.8E+03	n	1.0E-01	n	4.4E-01	n	8.6E+01	n		8.6E+01	n	
				1.0E-03	I			V		1			Vernolate	1929-77-7	7.8E+01	n	1.2E+03	n					1.1E+01	n		8.9E-03	n	
				1.2E-03	O					1	0.1		Vinclozolin	50471-44-8	7.6E+01	n	9.8E+02	n					2.1E+01	n		1.6E-02	n	
				1.0E+00	H	2.0E-01	I	V		1		2.8E+03	Vinyl Acetate	108-05-4	9.1E+02	n	3.8E+03	ns	2.1E+02	n	8.8E+02	n	4.1E+02	n		8.7E-02	n	
		1.5E-05	P			3.0E-03	I	V		1		2.5E+03	Vinyl Bromide	593-60-2	2.6E-01	c*	1.1E+00	c*	1.9E-01	c*	8.2E-01	c*	3.7E-01	c*		1.1E-04	c*	
7.2E-01	I	4.4E-06	I	3.0E-03	I	1.0E-01	I	V	M	1		3.9E+03	Vinyl Chloride	75-01-4	5.9E-02	c	1.7E+00	c	1.7E-01	c	2.8E+00	c	1.9E-02	c	2.0E+00	6.5E-06	c	6.9E-04
				3.0E-04	I					1	0.1		Warfarin	81-81-2	1.9E+01	n	2.5E+02	n					5.6E+00	n		5.9E-03	n	
				2.0E-01	G	1.0E-01	G	V		1		3.9E+02	Xylene, m-	108-38-3	5.5E+02	ns	2.4E+03	ns	1.0E+02	n	4.4E+02	n	1.9E+02	n		1.9E-01	n	
				2.0E-01	G	1.0E-01	G	V		1		4.3E+02	Xylene, o-	95-47-6	6.4E+02	ns	2.8E+03	ns	1.0E+02	n	4.4E+02	n	1.9E+02	n		1.9E-01	n	
				2.0E-01	G	1.0E-01	G	V		1		3.9E+02	Xylene, p-	106-42-3	5.6E+02	ns	2.4E+03	ns	1.0E+02	n	4.4E+02	n	1.9E+02	n		1.9E-01	n	
				2.0E-01	I	1.0E-01	I	V		1		2.6E+02	Xylenes	1330-20-7	5.8E+02	ns	2.5E+03	ns	1.0E+02	n	4.4E+02	n	1.9E+02	n	1.0E+04	1.9E-01	n	9.9E+00
				3.0E-04	I					1			Zinc Phosphide	1314-84-7	2.3E+01	n	3.5E+02	n					6.0E+00	n				
				3.0E-01	I					1			Zinc and Compounds	7440-66-6	2.3E+04	n	3.5E+05	nm					6.0E+03	n		3.7E+02	n	
				5.0E-02	I					1	0.1		Zineb	12122-67-7	3.2E+03	n	4.1E+04	n					9.9E+02	n		2.9E+00	n	
				8.0E-05	X					1			Zirconium	7440-67-7	6.3E+00	n	9.3E+01	n					1.6E+00	n		4.8E+00	n	

Commonwealth of Virginia

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Michael S. Rolband, PE, PWD, PWS Emeritus
Director
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November 17, 2023

Mr. Len DiIoia Jr
Radford Army Ammunition Plant
Route 114, P.O. Box 1
Radford, Virginia 24143-0100

VIA ELECTRONIC MAIL

Re: Verification Event Notification for
Hazardous Waste Management Unit 16
Radford Army Ammunitions Plant
Route 114, Radford, Virginia 24141
EPA ID#: VA1210020730

Dear Mr. DiIoia:

This letter acknowledges the receipt and review of the Verification Event Notification for Hazardous Waste Management Unit 16 dated October 20 & 30, 2023, submitted to the Virginia Department of Environmental Quality (Department or DEQ), Office of Remediation Programs (ORP) by BAE Systems on behalf of the Radford Army Ammunitions Plant (RFAAP).

The Department acknowledges that the verification sampling confirmed the presence of silver and did not confirm the presence of cyanide in the groundwater beneath the unit. Further, the Department concurs with the recommendation to submit a Class 1 permit modification to add silver to the Groundwater Monitoring Compliance list. Lastly, the Department acknowledges that the verification sampling did not occur within sixty (60) days of the original sampling date. In the future, RFAAP should ensure that sampling data is being returned in a timely fashion from the laboratory so that verification sampling, if required, can be completed in compliance with Permit Section V.J.2.e.

If you have any questions regarding this correspondence, you may contact me at 703-232-4200 or by email at Kurt.Kochan@deq.virginia.gov.

Sincerely,

Kurt W. Kochan
Office of Remediation Programs

cc: RFAAP Correspondence File
Tara Mason, Ashby Scott, Nikki Herschler, DEQ
Melissa Lincoln, BAE
Mike Lawless, TRC Engineers