REGION 5

CHICAGO, IL 60604

September 29, 2025

PROPOSED DECISION TO REISSUE AN EXEMPTION FROM THE LAND DISPOSAL RESTRICTIONS OF THE HAZARDOUS AND SOLID WASTE AMENDMENTS OF 1984 ISSUED TO REPUBLIC INDUSTRIAL AND ENERGY SOLUTIONS, LLC FOR THE INJECTION OF HAZARDOUS WASTE

Action: Notice of intent to reissue an exemption from the land disposal restrictions of the Hazardous and Solid Waste Amendments of 1984.

Summary: The U.S. Environmental Protection Agency (EPA) is proposing to reissue the exemption for Republic Industrial and Energy Solutions, LLC. (RIES) from the land disposal restrictions under the Hazardous and Solid Waste Amendments of 1984 (HSWA) to the Resource Conservation and Recovery Act (RCRA). EPA issued that exemption in 2004. If the exemption is reissued, RIES may inject only hazardous wastes designated by the codes in Table 1 through two Class I hazardous waste injection wells #1-12 and #2-12.

On November 20, 2023, RIES submitted a petition to EPA seeking reissuance of its exemption from the prohibition on injection of restricted hazardous waste (petition) under Title 40 of the Code of Federal Regulations (40 C.F.R.) part 148, subpart B. RIES petitioned EPA to reissue the exemption for injection disposal wells, wells #1-12 and #2-12, at its existing facility. If this reissuance is granted, RIES may continue to inject hazardous wastes into the two wells. The reissued exemption would be approved for the 20-year modeled injection period, which ends on January 31, 2043.

As part of its petition, RIES was required to demonstrate that, to a reasonable degree of certainty, there will be no migration of hazardous constituents from the injection zone for as long as the waste remains hazardous. This demonstration requires a showing that meets the criteria at 40 C.F.R. § 148.20(a) and (b) which includes, among other things, a showing under 148.20(a)(i) that the hydrogeological and geochemical conditions at the site and the physiochemical nature of the waste stream(s) are such that reliable predictions can be made that any injected fluids will not migrate within 10,000 years: (1) vertically upward out of the injection zone or (2) laterally within the injection zone to a point of discharge or interface with an underground source of drinking water (USDW).

Pursuant to 40 C.F.R. § 148.20(e), any person who has been granted an exemption under 40 C.F.R. § 148.20 may submit a petition for reissuance of the exemption to include an additional restricted waste or wastes or to modify any conditions placed on the exemption by the Director. The Director shall reissue the petition if the petitioner complies with the requirements of paragraphs (a), (b) and (c) of section 148.20. One of the conditions of the 2004 exemption determination was that the exemption would become invalid 20 years after injection commences. RIES has submitted a petition to allow

injection of waste through well #1-12 and #2-12 to continue for an additional 20 years; and provided a demonstration supporting the reissuance of the exemption.

EPA conducted a comprehensive review of RIES's November 20, 2023, petition, revisions to the petition dated July 21, 2025, and other materials RIES submitted to EPA. Based on its review, EPA determined that RIES has complied with the requirements of 40 C.F.R. § 148.20(a), (b), (c), and (e), including by meeting the criteria in 40 C.F.R. § 148.21 and providing the components in 40 C.F.R. § 148.22(a). Accordingly, EPA is proposing to reissue RIES's exemption to allow the injection of certain restricted hazardous waste through the following two Class I hazardous waste injection wells at its facility: wells #1-12 and #2-12.

I. Background

A. Authority

HSWA expanded the scope and requirements of RCRA. As amended by HSWA, RCRA at Sections 3004(d), (e), (f), and (g), 42 U.S.C. § 6924(d), (e), (f), and (g), prohibits the land disposal of untreated hazardous waste beyond specified dates, unless EPA determines that the prohibition is not required in order to protect human health and the environment. Under RCRA Section 3004(k), 42 U.S.C. § 6924(k), land disposal includes any placement of hazardous waste into an injection well. A method of land disposal may not be determined to be protective of human health and the environment (except with respect to a hazardous waste which has complied with the pretreatment regulations promulgated under subsection 3004(m)) unless, upon application by an interested person, it has been demonstrated to a reasonable degree of certainty, that there will be no migration of hazardous constituents from the disposal unit or injection zone for as long as the wastes remain hazardous. See 42 U.S.C. § 6924(g)(5). EPA promulgated regulations at 40 C.F.R. Part 148 that govern such applications to dispose of hazardous wastes in Class I hazardous waste injection wells. See 53 Fed. Reg. 28118 (Jul. 26, 1988). EPA proposes to exempt RIES from the prohibition on land disposal because it has demonstrated pursuant to 40 C.F.R. Part 148, that, to a reasonable degree of certainty, there will be no migration of hazardous constituents out of the injection zone or into an underground source of drinking water (USDW) for at least 10,000 years.

Applicants seeking an exemption from the land disposal restrictions under 40 C.F.R. § 148.20(a)(1) must show that the hydrogeological and geochemical conditions at the site and the physiochemical nature of the waste stream(s) are such that reliable predictions can be made that: (i) fluid movement conditions are such that the injected fluids will not migrate within 10,000 years: (A) vertically upward out of the injection zone; or (B) laterally within the injection zone to a point of discharge or interface with an Underground Source of Drinking Water (USDW); or (ii) before the injected fluids migrate out of the injection zone or to a point of discharge or interface with a USDW, the fluid will no longer be hazardous because of attenuation, transformation, or immobilization of hazardous constituents within the injection zone by hydrolysis, chemical interactions, or other means. RIES submitted a petition under 40 C.F.R. § 148.20(a)(1)(i).

For each well, 40 C.F.R. § 148.20(a)(2) requires a petition to have: (i) demonstrated that the injection well's area of review complies with the substantive requirements of 40 C.F.R. § 146.63; (ii) located, identified, and ascertained the condition of all wells within the injection well's area of review (as specified in 40 C.F.R. § 146.63) that penetrate the injection zone or the confining zone by use of a protocol acceptable to the Director that meets the substantive requirements of 40 C.F.R. § 146.64; (iii) submitted a corrective action plan that meets the substantive requirements of 40 C.F.R. § 146.64, the implementation of which shall become a condition of petition approval; and (iv) submitted the results of pressure and radioactive tracer tests performed within one year prior to submission of the petition demonstrating the mechanical integrity of the well's long string casing, injection tube, annular seal, and bottom hole cement. (In cases where the petition has not been approved or denied within one year after the initial demonstration of mechanical integrity, the Director may require the owner or operator to perform the tests again and submit the results of the new tests.) Under 40 C.F.R. § 148.20(b), a demonstration under 40 C.F.R. § 148.20(a)(1)(i) shall identify the strata within the injection zone which will confine fluid movement above the injection interval and include a showing that the strata are free of known transmissive faults or fractures and that there is a confining zone above the injection zone. (Subsection (c) looks at the strata within the injection zone for a 40 C.F.R. § 148.20(a)(1)(ii) demonstration.)

B. Facility Information and Operation

RIES operates a commercial waste disposal facility in Romulus, Wayne County, Michigan. The facility disposes of liquid hazardous waste from multiple sources through two existing Class I hazardous waste injection wells. These wells are currently permitted and operated according to Safe Drinking Water Act Underground Injection Control (UIC) regulations administered by the EPA. In 2024, EPA reissued permits to RIES to dispose of hazardous waste commercially by deep well injection through the two existing injection wells.

The 2023 petition is based on a long-term average injection rate, for the facility as a whole, of 166 gallons per minute (gpm) averaged over one-month periods for a total of 87,249,000 gallons per year. The instantaneous injection rate may reach 225 gpm for the facility. The long-term average rate limit is used to bound the area of the waste plume so that the plume will be no larger than the area estimated in the petition. The instantaneous limit will allow RIES to inject more waste for some periods of time than others to accommodate deliveries during normal business hours and other occurrences.

As discussed below, the wastes are being injected between 3,356 and 4,537 feet below ground level (bgl) through existing wells that have been operating for about 20 years. There is no potential that the proposed activity would change the circumstances on or near the surface. It would thus not affect any historic properties or the habitats of any species.

C. Submission

On January 21, 2000, RIES submitted a petition for exemption from the land disposal restrictions of HSWA. EPA issued an exemption and published it in the Federal Register on March 25, 2004. On November 20, 2023, RIES submitted a petition requesting the reissuance of

the existing exemption. EPA reviewed this submission for completeness and conformance with 40 C.F.R. part 148. EPA requested additional information on April 30, 2025; and RIES provided additional information on June 16, 2025, June 30, 2025, July 21, 2025, and August 25, 2025.

II. Basis for Determination

A. Waste Identification, Analysis, and Estimation Techniques (40 C.F.R. § 148.22(a)), 40 C.F.R. § 148.21(a)(1) and (2)) – Under 40 C.F.R. § 148.22(a)(1) and (2), any petition must include an identification of the specific waste or wastes and the specific injection well or wells for which the demonstration will be made and a waste analysis to describe fully the chemical and physical characteristics of the subject wastes. In its petition, RIES identified all hazardous waste codes and wells #1-12, and #2-12 for which its demonstration was made. RIES included a waste analysis that describes the chemical and physical characteristics of all current hazardous waste codes. EPA proposes to limit RIES's exemption to the waste codes identified in Table 1. EPA is proposing to remove waste codes K140, U365, and U396 from the exemption because those are no longer hazardous waste codes in the federal or the Michigan hazardous waste regulations.

Under 40 C.F.R. § 148.21(a)(1), all waste analysis and any new testing performed by the petitioner must be accurate and reproducible and performed in accordance with quality assurance standards. EPA evaluated RIES's Quality Assurance Plan and determined it to be sufficient. Under 40 C.F.R. § 148.21(a)(2), estimation techniques must be appropriate, and EPA-certified test protocols must be used where available and appropriate. When precise values necessary for the demonstration were not available, RIES used appropriate estimates to generate conservative results and performed a sensitivity analysis to evaluate their importance.

B. Wells in Area of Review (40 C.F.R. §§ 146.63, 146.64 and 148.20(a)(2)(i), (ii), and (iii)) – Under § 148.20(a)(2)(i), the petitioner must show that the injection well's AOR complies with the substantive requirements of 40 C.F.R. § 146.63. 40 C.F.R. § 146.63 requires that the AOR for Class I hazardous waste injection wells shall be a minimum 2-mile radius around the well bore. RIES has demonstrated that the injection wells' AOR complies with 40 C.F.R. § 146.63 by selecting a 7.11-mile radius as the AOR. RIES's decision to consider a 7.11-mile radius rather than a 2-mile radius as the AOR is more protective of the environment because RIES is looking at a larger area for penetrations into the confining zone.

Under 40 C.F.R. § 148.20(a)(2)(ii), the petitioner must locate, identify, and ascertain the condition of all wells within the injection well's AOR that penetrate the injection zone or the confining zone and meet the substantive requirements of 40 C.F.R. § 146.64. Substantive requirements of 40 C.F.R. § 146.64 include corrective action if wells are improperly plugged, completed, or abandoned. Under 40 C.F.R. § 148.20(a)(2)(iii), the petitioner must submit a corrective action plan. RIES conducted a well search over the AOR and found that there are six wells penetrating the top of the confining or injection zone within this AOR. These six wells consist of one active brine disposal well, four plugged and abandoned wells, and one plugged and abandoned Class I injection well drilled by Environmental Disposal Systems (EDS). RIES

provided completion and plugging reports showing that these six wells are properly constructed or plugged. Accordingly, under 40 C.F.R. § 148.20(a)(2)(iii) and 40 C.F.R. § 146.64, RIES does not need to submit a corrective action plan.

C. Mechanical Integrity Test Information (40 C.F.R. § 148.20(a)(2)(iv)) – Under 40 C.F.R. § 148.20(a)(2)(iv), the petitioner must submit the results of pressure and radioactive tracer tests performed within one year prior to submission of the petition demonstrating the mechanical integrity of the wells' long string casing, injection tubing, annular seal, and bottom hole cement[1]. In cases where the petition has not been approved or denied within one year after the initial demonstration of mechanical integrity, EPA may require the owner or operator to perform the tests again and submit the results of the new tests. RIES conducted mechanical integrity tests on wells #1-12, and #2-12 on August 11, 2023, and September 5, 2023. These tests were performed within one year prior to RIES's petition submission in November 2023. Since submitting the petition, RIES has conducted approved mechanical integrity tests on wells #1-12 and #2-12 on August 6, 2024. The results from these tests confirmed that all injected fluids were entering the approved injection interval and not channeling up the well bore out of the injection zone. Each year, RIES also submits mechanical integrity test results to EPA.

D. Site-Specific Information (40 C.F.R. §§ 148.20(b) and 148.21(b)) – Under 40 C.F.R. § 148.20(b), the petitioner must identify the strata within the injection zone which will confine fluid movement above the injection interval and include a showing that these strata are free of known transmissive faults or fractures. The petitioner must also show that there is a confining zone above the injection zone. Under 40 C.F.R. § 148.21(b), the petitioner must provide sufficient site-specific information to support the demonstration that there will be no migration of hazardous constituents from the injection zone for as long as the waste remains hazardous. In support of its demonstration, RIES provided site-specific geologic, hydrologic, and geochemical information, including descriptions of the depositional environments of the formations, well logs, cross-sections, well and formation tests, and geologic maps. A summary of the site-specific information is provided below.

1. **Identification of Underground Sources of Drinking Water (USDW)** – The lowermost USDW at the site is the Detroit River Formation, the base of which is at approximately 342 feet bgl. There is approximately 3,582 feet of rock between the base of the lowermost USDW and the top of the injection interval, where the waste is emplaced. This separation is composed of carbonates, shales, and sandstones which are predominantly characterized by low permeability at this location.

2. **Injection Zone** – The injection zone is defined as "a geological 'formation', group of formations, or part of a formation receiving fluids through a well." The injection zone must have sufficient permeability, porosity, thickness, and extent to contain the injected fluids. The injection zone for the RIES facility is composed of the injection interval and the overlying arrestment interval; this includes the Precambrian wash sediments, Mount Simon Sandstone, Eau Claire Formation, Franconia-Galesville Formation, Trempealeau Formation,

[1] "Bottom hole cement" refers to the cement at the bottom of the casing which seals the space between the base of the casing and the rock which surrounds it.

Prairie du Chien Group, Glenwood Shale, and lower Black River Formation, between 3,356 and 4,537 feet bgl. The injection interval is located at depths between 3,924 and 4,537 feet bgl and is where the waste is directly emplaced. The injection interval can accept the waste because of its high permeability and porosity and its extent and thickness.

The arrestment interval ranges from 3,356 and 3,924 feet bgl and is composed of the Trempealeau Formation, Prairie du Chien Group, Glenwood Shale, and lower Black River Formation. These formations are continuous rock formations of low vertical permeability and are free of known transmissive faults or fractures over an area sufficient to prevent the upward movement of waste.

3. **Confining Zone** – 40 C.F.R. § 146.62 specifies the minimum criteria for siting Class I hazardous waste injection wells. It requires that the injection zone must be overlain by at least one additional formation which can confine the injected fluids. This formation is known as the confining zone, and it must be (1) laterally continuous, (2) free of transecting, transmissive faults or fractures over an area sufficient to prevent fluid movement, and (3) of sufficient thickness and lithologic and stress characteristics to prevent vertical propagation of fractures. The confining zone at the RIES facility is composed of the upper Black River Formation, Trenton Limestone, and Utica Shale found between 2,351 and 3,356 feet bgl. It is 1,005 feet thick, has no known transmissive faults or fractures within the AOR, and will resist vertical migration because of its low natural permeability.

   The same regulation, at 40 C.F.R. § 146.62(d)(2), provides that the owner or operator of a Class I hazardous waste well shall demonstrate to the satisfaction of the Director that the confining zone is separated from the lowermost USDW by at least one sequence of permeable and less permeable strata that will provide added layers of protection by either providing additional confinement (low permeability units) or allowing pressure bleed-off (high permeability units). Low porosity and permeability layers overlying the confining zone include the Clinton Formation and the Salina Formation. The Clinton Formation is made up of shales and dolomite having low porosity and permeability. The Salina Formation contains thick beds of dense anhydrite and salt separated by dolomite and shale. The anhydrite and salt offer very effective barriers to fracturing and flow because they deform plastically under the weight of the overlying formations to reseal any void space. High permeability bleed-off units overlying the confining zone include the White Niagaran and the Sylvania Sandstone. The White Niagaran is between 2,120 to 2,214 feet bgl and is a permeable dolomite. The Sylvania Sandstone is at a depth of 387 to 537 feet bgl and is a thick, porous, and permeable formation which has been used extensively as an injection zone in the area. It is capable of accepting large amounts of fluid without developing hydrostatic pressures which would be high enough to either fracture it or cause formation water to flow through an open conduit into the USDWs. The layers are continuous for hundreds of square miles. They provide the added layers of protection required by the regulations.

4. **Absence of Known Transmissive Faults** – There are no known transmissive faults in the Trempealeau Formation, Prairie du Chien Group, Glenwood Shale, and lower Black River Formation, the strata within the injection zone that will arrest fluid movement, or in the

overlying upper Black River Formation, Trenton Limestone, and Utica Shale that comprise the confining zone. Through geological and literature review, no faults were identified in the area surrounding the RIES facility. Additionally, multiple pressure fall off tests have been run in wells #1-12 and #2-12 since the wells began operation. Based on analyses of the recorded pressure transient data, no reservoir boundary conditions have been identified that would indicate the presence of a fault in the injection reservoir area influenced by these tests.

E. Predictive Model

1. **Model Development** – RIES used the Sandia Waste-Isolation Flow and Transport (SWIFT) Model for Fractured Media, a subsurface flow and pressure computer modeling program, to simulate migration of injected fluid from wells #1-12 and #2-12 and used the Visual Basic program PredictW to model pressure build-up in the injection interval. RIES used site specific data from logs, core, and other testing carried out during drilling and operation of wells #1-12 and #2-12 and site-specific information (i.e., hydrogeologic properties of the various rock layers and formation brines and characteristics of the injected fluid) in its model. In its 2023 petition for reissuance, RIES updated this model and site-specific data. When site-specific information was not available, RIES used data from peer-reviewed literature or data from facilities injecting hazardous waste into wells with similar site conditions.

2. **Time Period** – In the updated model, RIES used two simulated time periods for its demonstration: a 20-year operational period and a 10,000-year post-operational period. The modeled future operational period ending in January 2043 included two scenarios. One scenario modeled the full average injection rate of 166 gpm being injected into well #1-12 and well #2-12 having no injection during the operational period, while the other scenario modeled the full average injection rate of 166 gpm being injected into well #2-12 and well #1-12 having no injection during the operational period. Historical injection data from wells #1-12 and #2-12 in addition to historical injection data from Sunoco Partners #1A well, which is an active injection well in the AOR that injects into the same geologic units as wells #1-12 and #2-12, were used to determine the plume size and pressure build up in the injection zone at the beginning of the modeled operational period. The RIES model predicted the maximum vertical molecular diffusion and the horizontal drift of the waste plumes at the end of the 10,000-year post-operational period.

3. **Vertical Migration** – RIES made conservative assumptions when modeling the predicted vertical migration of injected hazardous waste. RIES assumed that evaluated hazardous waste constituents remain at their maximum concentration at the base of the arrestment interval for the full 10,000-year modeled timeframe. RIES also assumed that vertical movement begins at the base of the arrestment interval (which is the top of the injection interval) which is located at 3,924 feet bgl. The average porosity of the rock units in the arrestment interval was measured from geologic cores and was found to be low. Low porosity is important in order to prevent fluid from migrating upward. Based on measured values and the assumptions used in the model, RIES predicted the maximum vertical fluid movement will not reach the base of the confining zone. The model predicted that vertical

fluid movement would be 237 feet above the base of the arrestment interval at the end of the future operational period. This predicted maximum vertical fluid movement is 331 feet below the base of the confining zone.

RIES used conservative assumptions to maximize the distance of the plume for the 10,000-year post-operational period. RIES used health-based limits to determine the distance at which the constituent would no longer be hazardous (Table 2). Based on the values present in the updated 2023 model and the previous model for the 2004 petition, RIES predicted the maximum extent of movement to be 237 feet above the injection interval. This amount is much less than the 581-foot thickness of the arrestment interval.

4. **Lateral Migration** – The simulation of plume-flow distance and direction during the 10,000-year post-operational period included the natural flow within the injection interval, dispersion, and diffusion. Predictions based on literature values indicated that the rate of regional flow is less than 0.4 ft/year. As the direction of flow in the injection interval is uncertain, regional flow was modeled both parallel to the dip of the rock strata and perpendicular to dip. To obtain conservative model outputs for lateral plume migration, the model does not incorporate the depletion of hazardous waste constituents by vertical movement out of the injection interval. A concentration reduction factor (C/C_0) of $1x10^{-12}$ was used as the boundary for lateral plume migration at the end of the 10,000-year modeled period. The concentration reduction factor is the ratio of health-based limit or detection limit (Table 2) to the maximum wellhead concentration (Table 2) for a given hazardous waste constituent. This boundary limit defines the edge of the modeled plume as the location where the concentration of hazardous waste constituents is one-trillionth the maximum original concentration at the wellhead. The boundary represents the likely maximum distance of waste migration within 10,000 years. By modeling the migration of the injected waste, RIES was able to predict the pressure in the injection interval and the vertical and lateral movement of waste constituents.

5. **Pressure Build-Up** – RIES modeled the pressure build-up in the injection during the 20-year operation period. The modeling results of pressure build-up were used to determine the furthest extent of the critical pressure in the injection interval at the end of the 20-year operational period. The critical pressure is the minimum pressure value which would allow for upward fluid movement from the top of the injection interval to the base of the lowermost USDW. The critical pressure at the site of the RIES wells was calculated to be 92.58 psi based on the depths to geologic formations, the height of the freshwater column, the specific gravity of brine in the injection interval, and the original formation pressure in the injection interval. The furthest extent of the critical pressure at the end of the operation period was determined in both cases of the model for injection only into well #1-12 and only into well #2-12 to be 7.11 miles. This conservative distance of 7.11 miles was used as the radius of the AOR.

6. **Model Verification, Validation, Calibration, and Appropriateness (40 C.F.R. § 148.21(a)(3))** – Under 40 C.F.R. § 148.21(a)(3), predictive models must be: (1) verified and validated; (2) appropriate for the specific site, waste streams, and injection conditions of the operation;

and (3) calibrated for existing sites. The SWIFT computer codes and PredictW computer program have been used in previous no-migration demonstrations. The SWIFT computer codes have been verified extensively by prior testing which showed that the codes accurately represent the mathematical model.

Based on EPA's review of the information provided by RIES and review of the geology by EPA, EPA concluded that RIES's simulation model provided for the 2023 petition is a valid representation of the geology, physical processes, and boundary conditions at the site.

For the 2023 petition, RIES calibrated the SWIFT model for its site by adjusting certain parameters such as the permeabilities of various layers to reflect the observed data from pressure transient tests conducted between 2001 and 2022. The model is appropriate for this site because RIES used conservative values for the properties of the individual rock layers (e.g., permeability and porosity), the injection pressure, injection rate, and waste stream characteristics (e.g., specific gravity and viscosity).

F. Quality Assurance and Quality Control (40 C.F.R. § 148.21(a)(4)) – Under 40 C.F.R. § 148.21(a)(4), a quality assurance and quality control plan must address all aspects of the demonstration, which RIES did in its petition. For example, it addressed investigating artificial penetrations, integrity of geological data and core analysis, and reservoir modeling. The quality of the data is indicated by the consistency of the values. RIES followed an appropriate protocol for locating records of penetrations in the AOR, for collection and analyses of geologic and hydrogeologic data, for waste characterization, and for all tasks associated with the modeling demonstration.

G. Conservative values (40 C.F.R. § 148.21(a)(5)) – Under 40 C.F.R. § 148.21(a)(5), the petitioner must use reasonably conservative values whenever values taken from the literature or estimated on the basis of known information are used instead of site-specific measurements. As described above, when parameters were uncertain, RIES chose conservative values.

H. Sensitivity Analysis (40 C.F.R. § 148.21(a)(6)) – Under 40 C.F.R. § 148.21(a)(6), the petitioner must conduct a sensitivity analysis to determine the effect that significant uncertainty may contribute to the demonstration. The demonstration must be based on conservative assumptions identified in the analysis. RIES conducted a sensitivity analysis to determine the effect that uncertain parameters may have on its predictive model. RIES used a range of conservative input values for specific gravity, permeability, porosity, dispersivity, diffusivity, and fluid movement speed in its modeling of both pressure buildup and plume migration. RIES modeled two cases in which the combined maximum injection rate for both wells was applied separately to each well. Multiple directions of fluid movement, both parallel and perpendicular to the dip of injection interval strata, were used by RIES in its modeling of lateral fluid migration. In its sensitivity analysis, RIES demonstrated that the uncertainty in these parameters does not significantly change the predictions for pressure build-up in the injection interval or significantly affect waste migration or waste confinement predictions. Though the uncertainty of the parameters does not have significant effect on the migration of injected

fluids, RIES used the conservative assumptions identified in its sensitivity analysis to simulate migration of injected fluid in wells #1-12 and #2-12.

I. **Other information in support of petition (40 C.F.R. § 148.22(a)(3))** – Under 40 C.F.R. § 148.22(a)(3), EPA may require additional information to support the petition. RIES provided documentation related to the mechanical integrity of the RIES wells. RIES provided reports on the pressure fall-off tests and radioactive tracer surveys performed in the RIES wells. This information showed that the wells are operating as intended.

III. Conclusion

After a detailed and thorough review of the submitted petition and supporting documents, RIES's predictive model, and other information contained in the administrative record, EPA has determined that RIES has demonstrated that, to a reasonable degree of certainty, there will be no migration of hazardous constituents vertically out of the injection zone or laterally to a point of discharge or interface with a USDW in a 10,000-year period. Therefore, EPA proposes to reissue RIES's land ban exemption.

IV. Conditions of Petition Approval

This proposed reissuance of the land ban exemption for the continued injection of restricted hazardous waste is subject to the following conditions, which are necessary to assure compliance with the standard in 40 C.F.R. § 148.20(a). EPA may terminate this exemption under 40 C.F.R. § 148.24(a) for noncompliance by RIES with any condition of this exemption. EPA may terminate this exemption for any causes identified under 40 C.F.R. § 148.24(a) and shall terminate this exemption for causes identified under 40 C.F.R. § 148.24(b). If RIES wants to modify any of the conditions placed on the exemption, it must submit a petition for reissuance to EPA as required by 40 C.F.R. § 148.20(e) and (f).

1. The exemption applies to the two existing hazardous waste injection wells, #1-12 and #2-12, located at the RIES facility at 28470 Citrin Drive, Romulus, Michigan;

2. The injection zone for wells #1-12 and #2-12 is at depths of 3,369 to 4,537 ft below ground level (3,937 to 4,550 ft relative to kelly bushing; true vertical depths) and is composed of the Precambrian wash sediments, Mount Simon Sandstone, Eau Claire Formation, Franconia-Galesville Formation, Trempealeau Formation, Prairie du Chien Group, Glenwood Shale, and lower Black River Formation;

3. Injection shall only occur into the injection interval composed of the Precambrian wash sediments, Mount Simon Sandstone, Eau Claire Formation, and Franconia-Galesville Formation from 3,924 to 4,537 ft below ground level (3,937 to 4,550 ft relative to kelly bushing; true vertical depths);

4. The only hazardous waste that can be injected are the hazardous wastes designated by the RCRA waste codes found in Table 1;

5. The specific gravity of the injected waste must be within the range of 0.9 to 1.1 measured at a temperature of 68°F;

6. The combined total injection rate of both wells shall not exceed a monthly average of 166 gpm and a maximum instantaneous rate of 225 gpm;

7. The total injection volume shall not exceed 87,249,600 gallons annually into wells #1-12 and #2-12;

8. The injection pressure at the well head of wells #1-12 and #2-12 shall be limited to 968 psig;

9. Maximum concentrations of chemical contaminants which are hazardous at less than one part in a trillion (1:1,000,000,000,000) shall meet any limits for maximum concentration at the wellhead set in the permits;

10. RIES must submit copies of the reports on the annual bottom-hole pressure surveys conducted in wells #1-12, and #2-12 to EPA. The annual reports must include a comparison of reservoir parameters determined from the fall-off test, such as permeability, transmissibility, and long-term shut-in pressure, with parameters used in the approved no migration petition;

11. RIES must annually submit copies of a waste sample report and the reports on the annual radioactive tracer surveys and annulus pressure tests for wells #1-12 and #2-12 to EPA;

12. RIES shall notify EPA in writing if any injection well loses mechanical integrity and prior to any workover or plugging and shall provide workover or plugging to procedures to EPA prior to commencing the work;

13. RIES must fully comply with all requirements set forth in Underground Injection Control Permits MI-163-1W-C010 and MI-163-1W-C011 issued by EPA;

14. Upon the expiration, termination, revocation and reissuance, or modification of the permits referenced above, this exemption is subject to review;

15. This exemption is granted only while the underlying assumptions presented in the no migration petition submitted by RIES are valid;

16. Whenever EPA determines under 40 C.F.R. §§ 148.23 or 148.24 that the basis for approval of a petition may no longer be valid, EPA may terminate this exemption. There are also other causes for terminating an exemption at 40 C.F.R § 148.24. Whenever EPA determines that the basis for approval of a petition may no longer be valid, EPA will require a new demonstration in accordance with 40 C.F.R. §§ 148.20 and 148.23(b);

17. This exemption is only approved for the 20-year modeled injection period, which ends on January 31, 2043. RIES may petition EPA for a reissuance of the exemption beyond that

date, provided that a new and complete petition and no-migration demonstration is received at EPA, Region 5, by July 31, 2041.

In addition to the above conditions, this proposed approval of a petition for reissuance of an exemption is contingent on the validity of the information submitted in the RIES petition reissuance request for an exemption to the land disposal restrictions. Any final reissuance decision is subject to termination when any of the conditions occur which are listed in 40 C.F.R. § 148.24, including noncompliance, misrepresentation of relevant facts, or a determination that new information shows that the basis for approval is no longer valid.

Date: The EPA invites public comments on this proposed decision. Comments will be accepted until the deadline given in the public notice for this action. Late comments do not have standing and will not be considered in the decision process.

Submit written comments to:

Docket ID No. EPA-R05-OW-2025-1775 at
https://www.regulations.gov/docket/EPA-R05-OW-2025-1775

For Further Information: Contact Colin Murphy at (312) 886-6941 or Murphy.Colin.D@epa.gov.

D. Scott Ireland
Acting Director, Water Division

Table 1. List of RCRA waste codes approved for injection.

D002	D004	D005	D006	D007	D008	D009	D010	D011	D012	D013	D014
D015	D016	D017	D018	D019	D020	D021	D022	D023	D024	D025	D026
D027	D028	D029	D030	D031	D032	D033	D034	D035	D036	D037	D038
D039	D040	D041	D042	D043	F001	F002	F003	F004	F005	F006	F007
F008	F009	F010	F011	F012	F019	F024	F025	F032	F034	F035	F037
F038	F039	K001	K002	K003	K004	K005	K006	K007	K008	K009	K010
K011	K013	K014	K015	K016	K017	K018	K019	K020	K021	K022	K023
K024	K025	K026	K027	K028	K029	K030	K031	K032	K033	K036	K037
K038	K039	K040	K041	K042	K043	K044	K045	K046	K047	K048	K049
K050	K051	K052	K060	K061	K062	K069	K071	K073	K083	K084	K085
K086	K087	K088	K093	K094	K095	K096	K097	K098	K099	K100	K101
K102	K103	K104	K105	K106	K107	K108	K109	K110	K111	K112	K113
K114	K115	K116	K117	K118	K123	K124	K125	K126	K131	K132	K136
K141	K142	K143	K144	K145	K147	K148	K149	K150	K151	K156	K157
K158	K159	K161	K169	K170	K171	K172	P001	P002	P003	P004	P005
P006	P007	P008	P009	P010	P011	P012	P013	P014	P015	P016	P017
P018	P020	P021	P022	P023	P024	P026	P027	P028	P029	P030	P031
P033	P034	P036	P037	P038	P039	P040	P041	P042	P043	P044	P045
P046	P047	P048	P049	P050	P051	P054	P056	P057	P058	P059	P060
P062	P063	P064	P065	P066	P067	P068	P069	P070	P071	P072	P073
P074	P075	P076	P077	P078	P081	P082	P084	P085	P087	P088	P089
P092	P093	P094	P095	P096	P097	P098	P099	P101	P102	P103	P104
P105	P106	P108	P109	P110	P111	P112	P113	P114	P115	P116	P118
P119	P120	P121	P122	P123	P127	P128	P185	P188	P189	P190	P191
P192	P194	P196	P197	P198	P199	P201	P202	P203	P204	P205	U001
U002	U003	U004	U005	U006	U007	U008	U009	U010	U011	U012	U014
U015	U016	U017	U018	U019	U020	U021	U022	U023	U024	U025	U026
U027	U028	U029	U030	U031	U032	U033	U034	U035	U036	U037	U038
U039	U041	U042	U043	U044	U045	U046	U047	U048	U049	U050	U051
U052	U053	U055	U056	U057	U058	U059	U060	U061	U062	U063	U064
U066	U067	U068	U069	U070	U071	U072	U073	U074	U075	U076	U077
U078	U079	U080	U081	U082	U083	U084	U085	U086	U087	U088	U089
U090	U091	U092	U093	U094	U095	U096	U097	U098	U099	U101	U102
U103	U105	U106	U107	U108	U109	U110	U111	U112	U113	U114	U115
U116	U117	U118	U119	U120	U121	U122	U123	U124	U125	U126	U127
U128	U129	U130	U131	U132	U133	U134	U135	U136	U137	U138	U140
U141	U142	U143	U144	U145	U146	U147	U148	U149	U150	U151	U152
U153	U154	U155	U156	U157	U158	U159	U160	U161	U162	U163	U164
U165	U166	U167	U168	U169	U170	U171	U172	U173	U174	U176	U177
U178	U179	U180	U181	U182	U183	U184	U185	U186	U187	U188	U189

U190	U191	U192	U193	U194	U196	U197	U200	U201	U202	U203	U204
U205	U206	U207	U208	U209	U210	U211	U213	U214	U215	U216	U217
U218	U219	U220	U221	U222	U223	U225	U226	U227	U228	U234	U235
U236	U237	U238	U239	U240	U243	U244	U246	U247	U248	U249	U271
U278	U279	U280	U328	U353	U359	U364	U367	U372	U373	U387	U389
U394	U395	U404	U409	U410	U411						

Table 2. Concentration reduction factors for hazardous waste constituents with assigned waste codes.

CAS No.	Possible Waste Codes	Chemical Name	Reference Molecule	Land Ban (mg/l)	Source	Detection Limit (mg/l)	SW-846 Test Method	Maximum Weighted Concentration (mg/l)	Concentration Reduction Factor (CRF)
30558-43-1	U394	A2213 (2-(Dimethylamino)-N-hydroxy-2-oxo-ethanimidothioic acid methyl ester)				1.0E-02	8270	1.0E+06	1.0E-08
208-96-8	F039, K001, K035, K087	Acenaphthalene (Acenaphthylene)				1.0E-02	8270	1.0E+06	1.0E-08
83-32-9	F032, F034, F037, F039, K035, K051, K088	Acenaphthene		6.0E-02	RFD			1.0E+06	6.0E-08
75-07-0	U001	Acetaldehyde (Ethanal)				1.1E-01	8315	1.0E+06	1.1E-07
67-64-1	F001, F002, F003, F004, F005, F039, K086, U002	Acetone (2-Propanone)		1.0E-01	RFD			1.0E+06	1.0E-07
75-05-8	F039, K011, K013, K014, K156, U003	Acetonitrile (Methyl cyanide)		6.0E-03	RFD			1.0E+06	6.0E-09
98-86-2	F039, K022, K086, K156 U004	Acetophenone (1-Phenylethanone)		1.0E-01	RFD			1.0E+06	1.0E-07
53-96-3	F039, U005	2-Acetylaminofluorene (N-2-Fluorenylacetamide) (N-9H-Fluoren-2-yl-acetamide) (mispelled "acetylaminefluorone" in 261 App. VIII)				2.0E-02	8270	1.0E+06	2.0E-08
75-36-5	U006	Acetyl chloride	Vinyl chloride			2.0E-04	8021	1.0E+06	2.0E-10
591-08-2	P002	1-Acetyl-2-thiourea ((N-aminothioxomethyl) acetamide)				1.0E+00	8270	1.0E+06	1.0E-06
107-02-8	F039, P003	Acrolein (2-Propenal)				5.0E-03	8260	1.0E+06	5.0E-09
79-06-1	K011, K013, K014, U007	Acrylamide (2-Propenamide)		8.0E-06	RSD			1.0E+06	8.0E-12
79-10-7	U008	Acrylic acid (2-Propenoic acid)		5.0E-01	RFD			1.0E+06	5.0E-07
107-13-1	F039, K011, K013, K014 U009	Acrylonitrile (2-Propenenitrile) (Vinyl cyanide)		6.0E-05	RSD			1.0E+06	6.0E-11
116-06-3	P070	Aldicarb		7.0E-03	MCL			1.0E+06	7.0E-09
1646-88-4	P203	Aldicarb sulfone (2-Methyl-2-(methylsulfonyl)-propanal-O-[(methylamino)carbonyl]oxime)		7.0E-03	MCL			1.0E+06	7.0E-09
309-00-02	F039, P004	Aldrin		2.0E-07	RSD			2.0E+05	1.0E-12
107-18-6	P005	Allyl alcohol (2-Propen-1-ol)		5.0E-03	RFD			1.0E+06	5.0E-09
107-05-1	F024, F025, F039	Allyl chloride (3-Chloropropene) (3-Chloropropylene)				3.0E-05	8021	1.0E+06	3.0E-11
20859-73-8	P006	Aluminum phosphide		4.0E-04	RFD			1.0E+06	4.0E-10
92-67-1	F039	4-Aminobiphenyl (p-Biphenylamine)				2.0E-02	8270	1.0E+06	2.0E-08
2763-96-4	P007	5-Aminomethyl 3-isoxazolol (Muscimol) (5-(Aminomethyl)-3(2H)-isoxazolone)	N-Nitrosopyrrolidine			4.0E-02	8270	1.0E+06	4.0E-08
504-24-5	P008	4-Aminopyridine (4-Pyridinamine)	Pyridine			5.0E-03	8260	1.0E+06	5.0E-09
61-82-5	U011	Amitrole (1H-1,2,4-Triazol-3-amine)	p-dimethylaminoazobenzene			1.0E-02	8270	1.0E+06	1.0E-08
131-74-8	P009	Ammonium picrate (2,4,6-Trinitrophenol ammonium salt)	2,4-Dinitrophenol			5.0E-02	8270	1.0E+06	5.0E-08
7803-55-6	P119	Ammonium vanadate	Vanadium			4.0E-03	7911	1.0E+06	4.0E-09
62-53-3	F039, U012, K083, K103, K104, K112, K113, K156	Aniline (Benzenamine)		6.0E-03	RSD			1.0E+06	6.0E-09
120-12-7	F032, F034, F037, F039, K015, K035, K049, K051, K088	Anthracene		3.0E-01	RFD			1.0E+06	3.0E-07
7440-36-0	F039, K021, K061, K088, K161, K176, K177	Antimony		6.0E-03	MCL			1.0E+06	6.0E-09
140-57-8	F039	Aramite		1.0E-03	RSD			1.0E+06	1.0E-09

CAS No.	Possible Waste Codes	Chemical Name	Reference Molecule	Land Ban (mg/l)	Source	Detection Limit (mg/l)	SW-846 Test Method	Maximum Weighted Concentration (mg/l)	Concentration Reduction Factor (CRF)
7440-38-2	D004, F032, F034, F035, F039, K031, K060, K061, K084, K088, K101, K102, K161, K171, K172, K174, K175, K177, P010, P011, P012, P036, P038, U136	Arsenic		5.0E-02	MCL			1.0E+06	5.0E-08
7778-39-4	P010	Arsenic acid	Arsenic			1.0E-03	7060	1.0E+06	1.0E-09
1303-28-2	P011	Arsenic pentoxide	Arsenic			1.0E-03	7060	1.0E+06	1.0E-09
1327-53-3	P012	Arsenic trioxide	Arsenic			1.0E-03	7060	1.0E+06	1.0E-09
492-80-8	U014	Auramine	4,4-Oxydianiline			2.0E-02	8270	1.0E+06	2.0E-08
115-02-6	U015	Azaserine (L-Serine diazoacetate(ester))	Dimethylaminoazobenzene			1.0E-02	8270	1.0E+06	1.0E-08
101-27-9	U280	Barban ((3-Chlorophenyl)carbamic acid 4-chloro-2-butynyl ester)				2.4E-03	8321	1.0E+06	2.4E-09
7440-39-3	D005, F039, K061, K088, P013	Barium		2.0E+00	MCL			1.0E+06	2.0E-06
542-62-1	P013	Barium cyanide	Cyanide			2.0E-01	9010	1.0E+06	2.0E-07
22781-23-3	U278	Bendiocarb (2,2-Dimethyl-1,3-benzodioxol-4-ol methylcarbamate)				3.0E-04	8321	1.0E+06	3.0E-10
22961-82-6	U364	Bendiocarb phenol (2,2-Dimethyl-1,3-benzodioxol-4-ol)				1.0E-02	8270	1.0E+06	1.0E-08
17804-35-2	K156, K158, U271	Benomyl ([1-[(Butylamino)carbonyl]-1H-benzimidazol-2-yl] carbamic acid methyl ester)		5.0E-02	RFD			1.0E+06	5.0E-08
225-51-4	U016	Benz[c]acridine	Dibenz[a,j]acridine			1.0E-02	8270	1.0E+06	1.0E-08
98-87-3	K015, U017	Benzal chloride				2.0E-05	8121	1.0E+06	2.0E-11
56-55-3	F032, F034, F037, F039, K001, K035, K051, K088, K141, K142, K143, K144, K145, K147, K148, K170, U018	Benz[a]anthracene (1,2-Benzanthracene)				1.3E-04	8310	1.0E+06	1.3E-10
71-43-2	D018, F001, F002, F003, F004, F005, F024, F025, F037, F038, F039, K011, K013, K014, K048, K049, K051, K052, K060, K083, K085, K087, K103, K104, K105, K141, K142, K143, K144, K145, K147, K151, K156, K158, K159, K169, K171, K172, U019	Benzene		5.0E-03	MCL			1.0E+06	5.0E-09
98-09-9	U020	Benzenesulfonyl chloride	Benzene thiol			2.0E-02	8270	1.0E+06	2.0E-08
92-87-5	U021	Benzidine		2.0E-07	RSD			2.0E+05	1.0E-12
205-99-2	F032, F034, F039, K001, K015, K035, K088, K141, K142, K143, K144, K147, K148, K170	Benzo[b]fluoranthene				1.8E-04	8310	1.0E+06	1.8E-10
207-08-9	F032, F034, F039, K015, K088, K141, K142, K143, K144, K147, K148, K170	Benzo[k]fluoranthene				1.7E-04	8310	1.0E+06	1.7E-10
191-24-2	F039, K088	Benzo[g, h, i] perylene				7.6E-04	8310	1.0E+06	7.6E-10

CAS No.	Possible Waste Codes	Chemical Name	Reference Molecule	Land Ban RBL (mg/l)	Source	Detection Limit (mg/l)	SW-846 Test Method	Maximum Value for Concentration (mg/l)	Concentration Reduction Factor (CRF)
50-32-8	F032, F034, F037, F038, F039, K001, K035, K048, K049, K050, K051, K052, K098, K060, K141, K142, K143, K144, K145, K147, K148, K170, U022	Benzo[a]pyrene		2.0E-04	MCL			1.0E+06	2.0E-10
106-51-4	U197	p-Benzoquinone (Quinone) (2,5-Cyclohexadiene-1,4-dione)				1.0E-02	8270	1.0E+06	1.0E-08
98-07-7	U023, K015, K149	Benzotrichloride		3.0E-06	RSD			1.0E+06	3.0E-12
100-44-7	P028, K015, K085, K149	Benzyl chloride ((Chloromethyl)benzene)		2.0E-04	RSD			1.0E+06	2.0E-10
7440-41-7	F039, K061, K088, P015	Beryllium		4.0E-03	MCL			1.0E+06	4.0E-09
319-84-6	D013, F024, F039, U129	alpha BHC (see lindane) (alpha-Hexachlorocyclohexane)		6.0E-06	RSD			1.0E+06	6.0E-12
319-85-7	D013, F024, F039, U129	beta BHC (see lindane) (beta-Hexachlorocyclohexane)		2.0E-05	RSD			1.0E+06	2.0E-11
319-86-8	D013, F024, F039, U129	delta BHC (see lindane) (delta - Hexachlorocyclohexane)				2.0E-04	8121	1.0E+06	2.0E-10
598-31-2	P017	Bromoacetone (1-Bromo-2-propanone)				3.0E-05	8021	1.0E+06	3.0E-11
75-27-4	F039	Bromodichloromethane (Trihalomethane)		6.0E-04	RSD			1.0E+06	6.0E-10
75-25-2	F039, U225	Bromoform (Trihalomethane) (Tribromomethane)		4.0E-03	RSD			1.0E+06	4.0E-09
101-55-3	F039, U030	4-Bromophenyl phenyl ether				1.0E-02	8270	1.0E+06	1.0E-08
357-57-3	P018	Brucine (2,3-Dimethoxystrychnidin-10-one)	Strychnine			3.0E-04	8321	1.0E+06	3.0E-10
71-36-3	F001, F002, F003, F004, F005, F039, K086, U031	n-Butyl alcohol (1-Butanol)		1.0E-01	RFD			1.0E+06	1.0E-07
2008-41-5	K156	Butylate (bis(2-Methylpropyl)carbamothioic acid S-ethyl ester)		5.0E-02	RFD			1.0E+06	5.0E-08
85-68-7	F039, K086	Butyl benzyl phthalate		2.0E-01	RFD			1.0E+06	2.0E-07
75-60-5	U136	Cacodylic acid (Dimethylarsenic acid)	Arsenic			1.0E-03	7060	1.0E+06	1.0E-09
7440-43-9	D006, F006, F007, F008, F009, F011, F012, F039, K028, K061, K064, K065, K066, K069, K088, K100, K101, K102, K176	Cadmium		5.0E-03	MCL			1.0E+06	5.0E-09
13765-19-0	U032	Calcium chromate	Chromium			1.0E-03	7191	1.0E+06	1.0E-09
592-01-8	P021	Calcium cyanide		4.0E-02	RFD			1.0E+06	4.0E-08
63-25-2	K156, U279	Carbaryl (1-Naphthalenol methylcarbamate)		1.0E-01	RFD			1.0E+06	1.0E-07
10605-21-7	K156, K158, U372	Carbendazim (1H-Benzimidazol-2-yl carbamic acid methyl ester)				4.0E-04	8321	1.0E+06	4.0E-10
1563-66-2	K156, K158, P127	Carbofuran (2,3-Dihydro-2,2-dimethyl-7-benzofuranol methylcarbamate)		4.0E-02	MCL			1.0E+06	4.0E-08
1563-38-8	U367	Carbofuran phenol (2,3-Dihydro-2,2-dimethyl-7-benzofuranol)				1.0E-02	8270	1.0E+06	1.0E-08
75-15-0	F001, F002, F003, F004, F005, F039, K049, K161, P022	Carbon disulfide		1.0E-01	RFD			1.0E+06	1.0E-07
353-50-4	U033	Carbon oxyfluoride (Carbonyl fluoride)	Dichlorodifluoromethane			5.0E-04	8021	1.0E+06	5.0E-10
56-23-5	D019, F001, F002, F003, F004, F005, F024, F025, F039, K016, K019, K020, K021, K073, K116, K150, K151, K157, U211	Carbon tetrachloride (Tetrachloromethane)		5.0E-03	MCL			1.0E+06	5.0E-09
55285-14-8	K156, K158, P189	Carbosulfan ([(Dibutylamino)thio] methyl-carbamic acid-2,3-dihydro-2,2-dimethyl-7-benzofuranyl ester)		1.0E-02	RFD			1.0E+06	1.0E-08
305-03-3	U035	Chlorambucil	5-Chloro-2-methylaniline			1.0E-02	8270	1.0E+06	1.0E-08
57-74-9	D020, F039, K032, K097	Chlordane		2.0E-03	MCL			1.0E+06	2.0E-09

CAS No.	Possible Waste Codes	Chemical Name	Reference Molecule	Land Ban RBL (mg/l)	Source	Detection Limit (mg/l)	SW-846 Test Method	Maximum Value for Concentration (mg/l)	Concentration Reduction Factor (CRF)
5103-71-9	D020, F039, K032, K097, U036	**Chlordane - alpha isomer**				**1.5E-03**	8081	1.0E+06	1.5E-09
5103-74-2	**D020, F039, K032, K097, U036**	**Chlordane - gamma isomer**				**1.8E-03**	8081	1.0E+06	1.8E-09
----	**F001**	**Chlorinated fluorocarbons, N.O.S.**	**Dichlorodifluoromethane**			**5.0E-04**	8021	1.0E+06	5.0E-10
494-03-1	**U026**	**Chlornaphazine (N-N'-bis(2-Chloroethyl) naphthalenamine)**	**1-Naphthylamine**			**1.0E-02**	8270	1.0E+06	1.0E-08
107-20-0	**P023, K010**	**Chloroacetaldehyde**				**5.9E-04**	8315	1.0E+06	5.9E-10
106-47-8	F039, P024	**p-Chloroaniline (4-chloro-Benzenamine)**		**4.0E-03**	**RFD**			1.0E+06	4.0E-09
108-90-7	D021, F001, F002, F003, F004, F005, F024, F025, F039, K015, K019, K085, K105, K149, K156, U037	**Chlorobenzene (Monochlorobenzene)**		**1.0E-01**	**MCL**			1.0E+06	1.0E-07
510-15-6	**F039, U038**	**Chlorobenzilate**		**2.0E-02**	**RFD**			1.0E+06	**2.0E-08**
124-48-1	F039	**Chlorodibromomethane (Trihalomethane) (Dibromochloromethane)**		**4.0E-04**	**RSD**			1.0E+06	**4.0E-10**
—	**K017**	**Chloroethers**	**2-Chloroethyl vinyl ether**			**3.0E-05**	8021	1.0E+06	**3.0E-11**
111-91-1	**F039, U024**	**bis (2 Chloroethoxy) methane (1,1'-[Methylenebis(oxy) bis[2-chloroethane]) (Dichloromethoxy ethane)**				**1.0E-02**	8270	1.0E+06	**1.0E-08**
110-75-8	**U042**	**2-Chloroethyl vinyl ether ((2-Chloroethoxy)ethene)**				**3.0E-05**	8021	1.0E+06	**3.0E-11**
67-66-3	D022, F024, F025, F039, K009, K010, K019, K020, K021, K029, K073, K116, K117, K118, K136, K149, K150, K151, K156, K157, K158, U044	Chloroform (Trihalomethane) (Trichloromethane)		6.0E-03	RSD			1.0E+06	6.0E-09
108-60-1 (39638-32-9)	F039, U027	bis-2-Chloroisopropyl ether (2,2'-oxybis[2-Chloropropane]) (Dichloroisopropyl ether) (bis(2-Chloro-1-methylethyl)ether)		**4.0E-02**	**RFD**			1.0E+06	**4.0E-08**
59-50-7	**F039, K001, U039**	**4-Chloro-m-cresol (4-Chloro-3-methylphenol) (p-Chloro-m-cresol)**				**2.0E-02**	8270	1.0E+06	**2.0E-08**
74-87-3	**F024, F025, F039, K009, K010, K018, K149, K150, K157, U045**	Chloromethane (Methyl chloride)		**5.0E-03**	**RSD**			1.0E+06	**5.0E-09**
107-30-2	**U046**	Chloromethyl methyl ether (Chloromethoxy-methane)				**3.0E-05**	8021	1.0E+06	**3.0E-11**
91-58-7	**F039, U047**	2-Chloronaphthalene (beta-Chloronaphthalene)		**8.0E-02**	**RFD**			1.0E+06	**8.0E-08**
3165-93-3	**U049**	4-Chloro-o-toluidine, hydrochloride	**5-Chloro-2-methylaniline**			**1.0E-02**	8270	1.0E+06	**1.0E-08**
95-57-8	**F039, K001, K105, U048**	o-Chlorophenol (2 Chlorophenol)		**5.0E-03**	**RFD**			1.0E+06	**5.0E-09**
5344-82-1	**P026**	1-(o-Chlorophenyl) thiourea ((2-Chlorophenyl) thiourea)				**7.4E-03**	8325	1.0E+06	**7.4E-09**
126-99-8	**F024, F025, F039**	Chloroprene (2-Chloro-1,3-butadiene)				**3.0E-05**	8021	1.0E+06	**3.0E-11**
542-76-7	**P027**	**beta-Chloropropionitrile (3-Chloropropanenitrile)**				**5.0E-03**	8260	**1.0E+06**	**5.0E-09**
7440-47-3	**D007, F006, F007, F008, F009, F011, F012, F019, F024, F032, F034, F035, F037, F038, F039, K002, K003, K004, K005, K006, K007, K008, K015, K022, K028, K048, K049, K050, K051, K052, K061, K062, K086, K088, K090, K091, K100, U032**	Chromium		1.0E-01	MCL			1.0E+06	1.0E-07

CAS No.	Possible Waste Codes	Chemical Name	Reference Molecule	Land Ban HBL (mg/l)	Source	Detection Limit (DL) (mg/l)	SW-846 Test Method	Maximum Wellhead Concentration (C0) (mg/l)	Concentration Reduction Factor (C/C0)
218-01-9	F032, F034, F037, F038, F039, K001, K035, K048, K049, K051, K087, K088, K141, K142, K143, K144, K145, K147, K148, K169, K170, K170, U050	Chrysene				1.5E-03	8310	1.0E+06	1.5E-09
544-92-3	F006, F007, F008, F009, F010, F011, F012, F019, K007, P029	Copper cyanide (Cuprous cyanide)		5.0E-03	RFD			1.0E+06	5.0E-09
8001-58-9	U051, K001, K035	Creosote, coal tar				1.0E-02	8270	1.0E+06	1.0E-08
8021-39-4	U051, K001, K035	Creosote, wood				1.0E-02	8270	1.0E+06	1.0E-08
1319-77-3	D026, F001, F002, F003, F004, F005, U052	Cresol, general (Cresylic acid) (Methyl phenol) (Tricresol)	p-Cresol			1.0E-02	8270	1.0E+06	1.0E-08
108-39-4	D024, F001, F002, F003, F004, F005, F039, K035, K052, U052	m-Cresol (3-Methylphenol)		5.0E-02	RFD			1.0E+06	5.0E-08
95-48-7	D023, F001, F002, F003, F004, F005, F039, K035, K052, U052	o-Cresol (2-Methylphenol)		5.0E-02	RFD			1.0E+06	5.0E-08
106-44-5	D025, F001, F002, F003, F004, F005, F039, K035, K052, U052	p-Cresol (4-Methylphenol)				1.0E-02	8270	1.0E+06	1.0E-08
123-73-9 (4170-30-3)	U053	Crotonaldehyde (2-Butenal) (beta-Methyl acrolein)				2.0E-03	8015	1.0E+06	2.0E-09
98-82-8	U055	Cumene (Isopropylbenzene)		1.0E-01	RFD			1.0E+06	1.0E-07
64-00-6	P202	m-Cumenyl methylcarbamate (3-(Methylethyl)-phenol methyl carbamate) (Hercules AC-5727)				3.0E-04	8321	1.0E+06	3.0E-10
57-12-5	D003, F006, F007, F008, F009, F010, F011, F012, F019, F037, F038, F039, K005, K007, K011, K013, K014, K048, K049, K050, K051, K052, K060, K086, K088, K104, P013, P021, P029, P030, P063, P074, P098, P099, P104, P106, P121	Cyanide		2.0E-01	MCL			1.0E+06	2.0E-07
----	F006, F007, F008, F009, F010, F011, F012, F019, F039, K007, K088, P030	Cyanide (complexed)				2.0E-01	9010	1.0E+06	2.0E-07
----	F006, F007, F008, F009, F010, F011, F012, F019, F039, K007, P030	Cyanide (salts)				2.0E-01	9010	1.0E+06	2.0E-07
----	F039, P030	Cyanides (soluble salts & complexes), N.O.S.				2.0E-01	9010	1.0E+06	2.0E-07
460-19-5	P031	Cyanogen (Ethanedinitrile)		4.0E-02	RFD			1.0E+06	4.0E-08
506-68-3	U246	Cyanogen bromide		9.0E-02	RFD			1.0E+06	9.0E-08
506-77-4	P033	Cyanogen chloride (Chlorine cyanide)		5.0E-02	RFD			1.0E+06	5.0E-08
110-82-7	U056	Cyclohexane	Benzene			9.0E-05	8021	1.0E+06	9.0E-11
108-94-1	F001, F002, F003, F004, F005, F039, K083, K086, U057	Cyclohexanone		5.0E+00	RFD			1.0E+06	5.0E-06
131-89-5	P034	2-Cyclohexyl-4,6-dinitrophenol		2.0E-03	RFD			1.0E+06	2.0E-09
50-18-0	U058	Cyclophosphamide	Octamethylpyrophosphoramide			2.0E-01	8270	1.0E+06	2.0E-07

CAS No.	Possible Waste Codes	Chemical Name	Reference Molecule	Land Ban HBL (mg/l)	Source	Detection Limit (DL) (mg/l)	SW-846 Test Method	Maximum Wellhead Concentration (C0) (mg/l)	Concentration Reduction Factor (C/C0)
94-75-7	D016, F039, K099, U240	2,4-D (2,4-Dichlorophenoxyacetic acid)		7.0E-02	MCL			1.0E+06	7.0E-08
----	U240	2,4-D, salts, esters	2,4-D			2.0E-04	8151	1.0E+06	2.0E-10
20830-81-3	U059	Daunomycin (Daunorubicin)	1,4-Naphthoquinone			1.0E-02	8270	1.0E+06	1.0E-08
53-19-0	F039, U060, U061	o, p' - DDD	p,p'- DDD			1.0E-02	8270	1.0E+06	1.0E-08
72-54-8	F039, U060, U061	p, p' - DDD (p, p'-Dichlorodiphenyl dichloroethane)		1.0E-04	RSD			1.0E+06	1.0E-10
3424-82-6	F039, U061	o, p' - DDE	p,p'- DDE			1.0E-02	8081	1.0E+06	1.0E-08
72-55-9	F039, U061	p, p' - DDE (p, p'-Dichlorodiphenyldichloroethylene)		1.0E-04	RSD			1.0E+06	1.0E-10
789-2-6	F039, U061	o, p' - DDT	p,p'- DDT			6.0E-03	8081	1.0E+06	6.0E-09
50-29-3	F039, U061	p, p' - DDT (p, p'-Dichlorodiphenyltrichloroethane)		1.0E-04	RSD			1.0E+06	1.0E-10
2303-16-4	U062	Diallate				6.0E-03	8081	1.0E+06	6.0E-09
53-70-3	U063, F032, F034, F039, K001, K035, K088, K141, K142, K144, K145, K147, K148, K170	Dibenz[a,h]anthracene (1,2:5,6-Dibenzanthracene)				3.0E-04	8310	1.0E+06	3.0E-10
192-65-4	F039	Dibenzo(a,e)pyrene				1.0E-02	8270	1.0E+06	1.0E-08
189-55-9	U064	Dibenzo[a,i]pyrene	Dibenzo[a,e]pyrene			1.0E-02	8270	1.0E+06	1.0E-08
96-12-8	F039, U066	Dibromochloropropane (1,2-Dibromo-3-chloropropane)		2.0E-04	MCL			1.0E+06	2.0E-10
126-72-7	F039, U235	2,3-Dibromo-1-propanol phosphate(3:1) (Tris(2,3-dibromopropyl)phosphate) (Tris-BP)				3.0E-04	8321	1.0E+06	3.0E-10
84-74-2	F037, F038, F039, K048, K051, K086, U069	Dibutyl phthalate (n-Butyl phthalate)		1.0E-01	RFD			1.0E+06	1.0E-07
25321-22-6	F024, F025, K085, K105	Dichlorobenzene	o-Dichlorobenzene			2.0E-04	8021	1.0E+06	2.0E-10
541-73-1	F024, F039, K085, K096, K105, U071	m-Dichlorobenzene (1,3-Dichlorobenzene)		6.0E-01	MCL			1.0E+06	6.0E-07
95-50-1	F001, F002, F003, F004, F005, F024, F039, K030, K042, K085, K086, K105, K156, U070	o-Dichlorobenzene (1,2-Dichlorobenzene)		6.0E-01	MCL			1.0E+06	6.0E-07
106-46-7	D027, F024, F039, K019, K030, K042, K085, K105, K149, K150, U072	p-Dichlorobenzene (1,4-Dichlorobenzene)		7.5E-02	MCL			1.0E+06	7.5E-08
91-94-1	U073	3,3'-Dichlorobenzidine		8.0E-05	RSD			1.0E+06	8.0E-11
1476-11-5	U074	cis-1, 4-Dichloro-2 butene				5.0E-03	8260	1.0E+06	5.0E-09
764-41-0	U074	trans-1,4 - Dichloro -2- butene				5.0E-03	8260	1.0E+06	5.0E-09
75-71-8	F039, U075	Dichlorodifluoromethane		2.0E-01	RFD			1.0E+06	2.0E-07
75-35-4	D029, U078, F024, F025, F039, K019, K020, K029	1,1-Dichloroethene (1,1-Dichloroethylene) (Vinylidene chloride)		7.0E-03	MCL			1.0E+06	7.0E-09
156-59-2	F039, K073, U079	1,2-Dichloroethene (Dichloroethylene) (Acetylene dichloride) (1,2-Dichloroethylene) (cis-1,2-Dichloroethylene)		7.0E-02	MCL			1.0E+06	7.0E-08
156-60-5	F024, F025, F039, K028, U079	trans-1,2-Dichloroethylene		1.0E-01	MCL			1.0E+06	1.0E-07
111-44-4	F039, K017, K019, U025	sym-Dichloroethyl ether (1-1'-Oxybis[2-chloroethane]) (Bis(2-Chloroethyl) ether)		3.0E-05	RSD			1.0E+06	3.0E-11
542-88-1	P016, K017	sym-Dichloromethyl ether (Oxybis[chloromethane]) (bis(Chloromethyl) ether)		1.6E-07	RSD			1.6E+05	1.0E-12
120-83-2	F039, K043, K099, U081	2,4-Dichlorophenol		3.0E-03	RFD			1.0E+06	3.0E-09
87-65-0	F039, K043, U082	2,6-Dichlorophenol				1.0E-02	8270	1.0E+06	1.0E-08

CAS No.	Possible Waste Codes	Chemical Name	Reference Molecule	Land Ban RBL (mg/l)	Source	Detection Limit (DL) (mg/l)	SW846 Test Method	Maximum Well Head Concentration, C0 (mg/l)	Concentration Reduction Factor (C/C0)
696-28-6	P036	Dichlorophenylarsine (Phenylarsonous dichloride)	Arsenic			1.0E-03	7060	1.0E+06	1.0E-09
26638-19-7	F024, F025	Dichloropropane	1,2-Dichloropropane			6.0E-05	8021	1.0E+06	6.0E-11
26545-73-3	K017	Dichloropropanol	1,2-Dichloropropane			6.0E-05	8021	1.0E+06	6.0E-11
26952-23-8	F024, F025	Dichloropropene	1,3-Dichloropropene			3.0E-05	8021	1.0E+06	3.0E-11
542-75-6	U084	1,3-Dichloropropene (1,3-Dichloro-1-propene)		3.0E-04	RFD			1.0E+06	3.0E-10
10061-01-5	F024, F039, U084	cis - 1,3 - Dichloropropene				3.0E-05	8021	1.0E+06	3.0E-11
10061-02-6	F024, F039, U084	trans - 1, 3 - Dichloropropene				3.0E-05	8021	1.0E+06	3.0E-11
60-57-1	F039, P037	Dieldrin		2.0E-06	RSD			1.0E+06	2.0E-12
1464-53-5	U085	1,2:3,4-Diepoxybutane				5.0E-03	8260	1.0E+06	5.0E-09
692-42-2	P038	Diethylarsine	Arsenic			1.0E-03	7060	1.0E+06	1.0E-09
123-91-1	F039, U108	1,4-Diethylenedioxide (Dioxane) (1, 4-Dioxane)		3.0E-03	RSD			1.0E+06	3.0E-09
5952-26-1	U395	Diethylene glycol, dicarbamate (2,2'-oxybis-Ethanol dicarbamate) (Reactacrease 4-DEG)				3.0E-04	8321	1.0E+06	3.0E-10
1615-80-1	U086	N,N'-Diethylhydrazine (1,2-Diethylhydrazine)	1,2 Diphenyl hydrazine			1.0E-02	8270	1.0E+06	1.0E-08
297-97-2	P040	O,O-Diethyl O-pyrazinyl phosphorothioate (Phosphorothioic acid O,O-diethyl O-pyrazinyl ester) (Thionazin)				4.0E-04	8141	1.0E+06	4.0E-10
84-66-2	F039, K086, U088	Diethyl phthalate		8.0E-01	RFD			1.0E+06	8.0E-07
311-45-5	P041	Diethyl-p-nitrophenyl phosphate (Phosphoric acid diethyl 4-nitropheny ester) (Paraoxon)	Parathion			1.0E-02	8270	1.0E+06	1.0E-08
3288-58-2	U087	O,O-Diethyl S-methyl dithiophosphate (O,O-diethyl S-methyl ester phosphorodithioic acid)				1.0E-02	8270	1.0E+06	1.0E-08
56-53-1	U089	Diethylstilbesterol (DES) (4,4-(1,2-diethyl-1,2-ethenediyl)bis-phenol)				2.0E-02	8270	1.0E+06	2.0E-08
94-58-6	U090	Dihydrosafrole				1.0E-02	8270	1.0E+06	1.0E-08
55-91-4	P043	Diisopropylfluorophosphate (Phosphorofluoridic acid bis (1 - methylethyl)ester) (DFP) (Isoflurophate)	Tri-p-tolyl phospate			1.0E-02	8270	1.0E+06	1.0E-08
60-51-5	P044	Dimethoate (Phosphorodithioic acid O,O-dimethyl S-[2-(methylamino)-2-oxoethyl] ester)		2.0E-04	RFD			1.0E+06	2.0E-10
119-90-4	U091	3,3'-Dimethoxybenzidine (Dianisidine)				7.7E-03	8325	1.0E+06	7.7E-09
124-40-3	U092	Dimethylamine (N-Methylmethanamine)	N-propylamine			5.0E-03	8260	1.0E+06	5.0E-09
60-11-7	U093	p-Dimethylaminoazobenzene				1.0E-02	8270	1.0E+06	1.0E-08
57-97-6	U094, U171	7,12-Dimethylbenz[a] anthracene (9,10-Dimethyl-1,2-benzanthracene)				1.0E-02	8270	1.0E+06	1.0E-08
119-93-7	U095	3,3'-Dimethylbenzidine (o-Tolidine)				3.3E-03	8325	1.0E+06	3.3E-09
80-15-9	U096	alpha,alpha-Dimethylbenzylhydroperoxide (1-Methyl-1-phenylethylhydroperoxide)	Benzyl alcohol			2.0E-02	8270	1.0E+06	2.0E-08
79-44-7	U097	Dimethylcarbamoyl chloride	Diallate			1.0E-02	8270	1.0E+06	1.0E-08
57-14-7	K107, K108, K109, K110, U098	1,1-Dimethylhydrazine (UDMH)	1,2 Diphenyl hydrazine			1.0E-02	8270	1.0E+06	1.0E-08
540-73-8	U099	1,2-Dimethylhydrazine	1,2 Diphenyl hydrazine			1.0E-02	8270	1.0E+06	1.0E-08
122-09-8	P046	alpha,alpha-Dimethylphenethylamine (alpha,alpha-Dimethylbenzeneethanamine) (Phentermine)				1.0E-02	8270	1.0E+06	1.0E-08
105-67-9	F032, F039, K001, K049, K052, U101	2,4-Dimethylphenol		2.0E-02	RFD			1.0E+06	2.0E-08
131-11-3	F039, K086, U102	Dimethyl phthalate				6.4E-03	8061	1.0E+06	6.4E-09

CAS No.	Possible Waste Codes	Chemical Name	Reference Molecule	Land Ban RBL (mg/l)	Source	Detection Limit (DL) (mg/l)	SW846 Test Method	Maximum Well Head Concentration, C0 (mg/l)	Concentration Reduction Factor (C/C0)
77-78-1	U103, K131	Dimethyl sulfate (Sulfuric acid dimethyl ester)				1.0E-02	8270	1.0E+06	1.0E-08
644-64-4	P191	Dimetilan (Dimethylcarbamic acid 1-[(dimethylamino)carbonyl]-5-methyl-1H-pyrazol-3-yl ester)				3.0E-04	8321	1.0E+06	3.0E-10
100-25-4	F039	1,4 - Dinitrobenzene (p-Dinitrobenzene)				4.0E-02	8270	1.0E+06	4.0E-08
99-65-0	K025	m-Dinitrobenzene		1.0E-04	RFD			1.0E+06	1.0E-10
534-52-1	F039, P047	4,6-Dinitro-o-cresol and salts (Dinitrocresol and salts) (2-Methyl-4, 6-dinitrophenol) (4, 6-Dinitro-2-methylphenol)				5.0E-02	8270	1.0E+06	5.0E-08
51-28-5	F039, K001, K103, K104, P048	2,4-Dinitrophenol		2.0E-03	RFD			1.0E+06	2.0E-09
121-14-2	D030, F039, U105, K025, K111	2,4-Dinitrotoluene		2.0E-03	RSD			1.0E+06	2.0E-09
606-20-2	F039, K111, U106	2,6-Dinitrotoluene				3.1E-04	8330	1.0E+06	3.1E-10
117-84-0	F039, K086, U107	Di-n-octyl phthalate				4.9E-04	8061	1.0E+06	4.9E-10
88-85-7	F039, P020	Dinoseb (2-(1-Methylpropyl)-4,6-dinitrophenol) (2-sec-butyl-4, 6-dinitrophenol)		7.0E-03	MCL			1.0E+06	7.0E-09
621-64-7	F039, U111	Di-n-propylnitrosamine (N-nitroso-N-propyl-1-propanamine)		5.0E-06	RSD			1.0E+06	5.0E-12
122-39-4	F039, K022, K083, K104	Diphenylamine		2.5E-02	RFD			1.0E+06	2.5E-08
122-66-7	F039, U109	1,2-Diphenylhydrazine		5.0E-05	RSD			1.0E+06	5.0E-11
86-30-6	F039, K022, K083	Diphenylnitrosoamine (N-Nitrosodiphenylamine)		7.0E-03	RSD			1.0E+06	7.0E-09
142-84-7	U110	Dipropylamine (n-Dipropylamine) (N-Propyl-1-propanamine)	n-Propyl amine			5.0E-03	8260	1.0E+06	5.0E-09
298-04-4	F039, K036, K037, P039	Disulfoton (Phosphorodithioic acid O,O-diethyl S-[2-ethylthio)ethyl] ester)		4.0E-05	RFD			1.0E+06	4.0E-11
—	P196, P205, K161	Dithiocarbamates (total)				9.0E-04	630.1	1.0E+06	9.0E-10
115-29-7	P050	Endosulfan		6.0E-03	RFD			1.0E+06	6.0E-09
939-98-8	F039, P050	Endosulfan I				1.0E-02	8270	1.0E+06	1.0E-08
33213-6-5	F039, P050	Endosulfan II				9.0E-03	8081	1.0E+06	9.0E-09
1031-7-8	F039, P050	Endosulfan sulfate				6.0E-03	8081	1.0E+06	6.0E-09
145-73-3	P088	Endothall (7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid)		1.0E-01	MCL			1.0E+06	1.0E-07
72-20-8	D012, F039, P051	Endrin		2.0E-03	MCL			1.0E+06	2.0E-09
7421-93-4	D012, F039, P051	Endrin aldehyde				8.0E-03	8081	1.0E+06	8.0E-09
—	P051	Endrin metabolites	Endrin			1.0E-02	8270	1.0E+06	1.0E-08
106-89-8	U041, K017	Epichlorohydrin (Chloromethyloxirane) (n-Chloro-2, 3-epoxypropane)		3.0E-03	RSD			1.0E+06	3.0E-09
51-43-4	P042	Epinephrine (4-[1-Hydroxy-2-(methylamino)ethyl]-1-2-benzenediol)	o-Cresol			1.0E-02	8270	1.0E+06	1.0E-08
759-94-4	K159	EPTC (Dipropylcarbamothioic acid S-ethyl ester) (Eptam) (S-Ethyl dipropylthiocarbamate)		2.5E-02	RFD			1.0E+06	2.5E-08
110-80-5	F001, F002, F003, F004, F005, U359	2-Ethoxyethanol (Ethylene glycol monoethyl ether)				5.0E-03	8260	1.0E+06	5.0E-09
141-78-6	F001, F002, F003, F004, F005, F039, K086, U112	Ethyl acetate (Acetic acid ethyl ester)		9.0E-01	RFD			1.0E+06	9.0E-07
140-88-5	U113	Ethyl acrylate (2-Propenoic acid ethyl ester)	Vinyl acetate			5.0E-02	8260	1.0E+06	5.0E-08
100-41-4	F001, F002, F003, F004, F005, F037, F038, F039, K048, K049, K051, K052, K086, K169, K170, K171, K172	Ethyl benzene		7.0E-01	MCL			1.0E+06	7.0E-07
51-79-6	U238	Ethyl carbamate (Urethan)				5.0E-02	8270	1.0E+06	5.0E-08
75-00-3	F039, K018	Ethyl chloride (Chloroethane)				1.0E-03	8021	1.0E+06	1.0E-09
111-54-6	U114	Ethylenebisdithiocarbamic acid	Diallate			6.0E-03	8081	1.0E+06	6.0E-09

CAS No.	Possible Waste Codes	Chemical Name	Reference Molecule	Land Ban RBL (mg/l)	Source	Detection Limit (L) (mg/l)	SW-846 Test Method	Maximum Wellhead Concentration, C0 (mg/l)	Concentration Reduction Factor (C/C0)
----	U114	Ethylenebisdithiocarbamic acids salts & esters	Ethyl carbamate			5.0E-02	8270	1.0E+06	5.0E-08
106-93-4	F039, K117, K118, K136 U067	Ethylene dibromide (1,2-dibromoethane)		5.0E-05	MCL			1.0E+06	5.0E-11
107-06-2	D028, F024, F025, F039, K018, K019, K020, K029, K030, K096, U077	Ethylene dichloride (1,2-Dichloroethane) (Ethylene chloride)		5.0E-03	MCL			1.0E+06	5.0E-09
151-56-4	P054	Ethyleneimine (Aziridine)	N-Propylamine			5.0E-03	8260	1.0E+06	5.0E-09
75-21-8	F039, U115	Ethylene oxide (Oxirane)				5.0E-03	8260	1.0E+06	5.0E-09
96-45-7	U116, K123, K124, K125, K126	Ethylene thiourea (2-Imidazolidinethione)		8.0E-05	RFD			1.0E+06	8.0E-11
60-29-7	F001, F002, F003, F004, F005, F039, U117	Ethyl ether (1,1'-Oxybis-ethane) (Diethyl ether)		2.0E-01	RFD			1.0E+06	2.0E-07
117-81-7	F024, F037, F038, F039, K048, K049, K051, K086, U028	bis(2-Ethylhexyl)phthalate (bis(2-Ethylhexyl) ester 1,2-benzenedicarboxylic acid) (Di (2-ethylhexyl) phthalate)		6.0E-03	MCL			1.0E+06	6.0E-09
75-34-3	F024, F025, F039, K018, K028, U076	Ethylidene chloride (Ethylidene dichloride) (1,1 Dichloroethane)				7.0E-04	8021	1.0E+06	7.0E-10
97-63-2	F039, U118	Ethyl methacrylate (Ethyl ester 2-propenoic acid)				5.0E-03	8260	1.0E+06	5.0E-09
62-50-0	U119	Ethyl methanesulfonate (Methanesulfonic acid ethyl ester)				2.0E-02	8270	1.0E+06	2.0E-08
52-85-7	F039, P097	Famphur (Phosphorthioic acid O-[4-[(dimethylamino) sulfonyl] phenyl] O,O-dimethyl ester)				3.0E-04	8321	1.0E+06	3.0E-10
206-44-0	F039, K001, K035, K087, K088, U120	Fluoranthene		4.0E-02	RFD			1.0E+06	4.0E-08
86-73-7	F032, F034, F037, F038, F039, K019, K035, K048, K051, K169, K170	9H-Flourene		4.0E-02	RFD			1.0E+06	4.0E-08
16984-48-8	F039, K088, P056, U134	Fluoride		4.0E+00	MCL			1.0E+06	4.0E-06
7782-41-4	P056	Fluorine		6.0E-02	RFD			1.0E+06	6.0E-08
640-19-7	P057	Fluoroacetamide (2-fluoro-acetamide)	1,4-Difluorobenzene			5.0E-03	8260	1.0E+06	5.0E-09
62-74-8	P058	Fluoroacetic acid, sodium salt		2.0E-05	RFD			1.0E+06	2.0E-11
50-00-0	U122, K009, K010, K038, K040, K156, K157	Formaldehyde		2.0E-01	RFD			1.0E+06	2.0E-07
23422-53-9	P198	Formetanate hydrochloride (N,N-dimethyl-N'-[3-[[(methylamino)carbonyl]oxy]phenyl]-methanimidamide monohydrochloride)				3.0E-04	8321	1.0E+06	3.0E-10
64-18-6	U123, K009, K010	Formic acid				1.0E-02	8270	1.0E+06	1.0E-08
17702-57-7	P197	Formparanate (N,N-dimethyl-N'-[2-methyl-4-[[(methylamino)carbonyl]oxy]phenyl]-methanimidamide)				3.0E-04	8321	1.0E+06	3.0E-10
110-00-9	U124	Furan (Furfuran)		1.0E-03	RFD			1.0E+06	1.0E-09
98-01-1	U125	Furfural (2-Furancarboxaldehyde)		3.0E-03	RFD			1.0E+06	3.0E-09
765-34-4	U126	Glycidylaldehyde (Oxiranecarboxyaldehyde)		4.0E-04	RFD			1.0E+06	4.0E-10
76-44-8	D031, F039, K032, K097, P059	Heptachlor		4.0E-04	MCL			1.0E+06	4.0E-10
1024-57-3	D031, F039, K032, K097, P059	Heptachlor epoxide		2.0E-04	MCL			1.0E+06	2.0E-10
----	D031	Heptachlor epoxide (alpha, beta & gamma isomers)				1.0E-02	8270	1.0E+06	1.0E-08
38998-75-3	F032	Heptachlorodibenzofurans, total (HpCDF)				2.5E-05	8280	1.0E+06	2.5E-11
67562-39-4	F039, K174, K178	1,2,3,4,6,7,8-Heptachlorodibenzofuran				2.5E-05	8280 (4)	1.0E+06	2.5E-11
55673-89-7	F039, K174, K178	1,2,3,4,7,8,9-Heptachlorodibenzofuran				2.5E-05	8280 (4)	1.0E+06	2.5E-11
37871-00-4	F032	Heptachlorodibenzo-p-dioxins, total (HpCDD)				2.5E-05	8280	1.0E+06	2.5E-11

CAS No.	Possible Waste Codes	Chemical Name	Reference Molecule	Land Ban RBL (mg/l)	Source	Detection Limit (L) (mg/l)	SW-846 Test Method	Maximum Wellhead Concentration, C0 (mg/l)	Concentration Reduction Factor (C/C0)
35822-46-9	F039, K174, K178	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin				2.5E-05	8280 (4)	1.0E+06	2.5E-11
118-74-1	D032, F024, F025, F039, K016, K018, K030, K042, K085, K149, K150, K151 U127	Hexachlorobenzene		1.0E-03	MCL			1.0E+06	1.0E-09
87-68-3	D033, F024, F025, F039, K016, K018, K028, K030, U128	Hexachlorobutadiene (1,1,2,3,4,4-Hexachloro-1,3-butadiene) (Hexachloro-1,3-butadiene)		5.0E-04	RSD			1.0E+06	5.0E-10
77-47-4	F024, F025, K032, F039, K016, K033, K034, K097, U130	Hexachlorocyclopentadiene (1,2,3,4,5,5-hexachloro-1,3-Cyclopentadiene)		5.0E-02	MCL			1.0E+06	5.0E-08
55684-94-1	F020, F021, F022, F023, F026, F027, F028, F032, F039, K043, K099, K174, K178	Hexachlorodibenzofurans, total (HxCDF)				2.5E-05	8280	1.0E+06	2.5E-11
19408-74-3	F020, F021, F022, F023, F026, F027, F028, F032, F039, K043, K099	Hexachlorodibenzo-p-dioxins (1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin)		6.0E-09	RSD			6.0E+03	1.0E-12
34465-46-8	F020, F021, F022, F023, F026, F027, F028, F032, F039, K043, K099, K174, K178	Hexachlorodibenzo-p-dioxins, all		6.0E-09	RSD (5)			6.0E+03	1.0E-12
67-72-1	D034, F024, F025, F039, K016, K018, K019, K028, K030, K073, K095, U131	Hexachloroethane		1.0E-03	RFD			1.0E+06	1.0E-09
70-30-4	U132	Hexachlorophene (2,2'-Methylenebis[3,4,6-trichlorophenol])		3.0E-04	RFD			1.0E+06	3.0E-10
1888-71-7	F039, K030, U243	Hexachloropropene (1,1,2,3,3,3-Hexachloro-1-propene)				1.0E-02	8270	1.0E+06	1.0E-08
757-58-4	P062	Hexaethyl tetraphosphate (Hexaethyl ester tetraphosphoric acid)	Hexamethyl phosphoramide			4.0E-04	8141	1.0E+06	4.0E-10
18540-29-9	F006, F019, K002, K003, K004, K005, K006, K007, K008, K048, K049, K050, K051, K061, K062, K069, K086, K100	Hexavalent chromium		5.0E-03	RFD			1.0E+06	5.0E-09
302-01-2	U133	Hydrazine (Hydrazine sulfate (CAS=10034-93-2))		1.0E-05	RSD			1.0E+06	1.0E-11
74-90-8	K011, K013, K014, P063	Hydrogen cyanide (Hydrocyanic acid)		2.0E-02	RFD			1.0E+06	2.0E-08
7664-39-3	U134	Hydrogen fluoride (Hydrofluoric acid)		4.0E+00	MCL (2)			1.0E+06	4.0E-06
7783-06-4	U135	Hydrogen sulfide (Sulfide)		3.0E-03	RFD			1.0E+06	3.0E-09
193-39-5	F032, F034, F039, K001, K035, K087, K088, K141, K142, K147, K148, U137	Indeno[1,2,3-cd] pyrene				4.3E-04	8310	1.0E+06	4.3E-10
78-83-1	F001, F002, F003, F004, F005, F039, U140	Isobutanol (Isobutyl alcohol) (2-Methyl-1-propanol)		3.0E-01	RFD			1.0E+06	3.0E-07
465-73-6	F039, P060	Isodrin				6.0E-03	8081	1.0E+06	6.0E-09
119-38-0	P192	Isolan (Dimethylcarbamic acid 3-methyl-1-(1-methylethyl)-1H-pyrazol-5-yl ester)				3.0E-04	8321	1.0E+06	3.0E-10
120-58-1	F039, U141	Isosafrole				1.0E-02	8270	1.0E+06	1.0E-08
143-50-0	F039, U142	Kepone				2.0E-02	8270	1.0E+06	2.0E-08
303-34-4	U143	Lasiocarpine	N-Nitrosopyrrolidine			4.0E-02	8270	1.0E+06	4.0E-08

CAS No.	Possible Waste Codes	Chemical Name	Reference Molecule	Land Ban LDR (mg/l)	Source	Detection Limit (L) (mg/l)	SW-846 Test Method	Maximum Wellhead Concentration, C0 (mg/l)	Concentration Reduction Factor (C/C0)
7439-92-1	D008, F006, F007, F008, F009, F011, F012, F035, F037, F038, F039, K001, K002, K003, K004, K005, K006, K007, K008, K028, K046, K048, K049, K050, K051, K052, K061, K062, K064, K065, K066, K069, K086, K087, K088, K100, K101, K102, K161, K176, K177, P110, U051, U144, U145, U146	Lead				1.0E-03	7421	1.0E+06	1.0E-09
301-04-2	U144	Lead acetate (Lead (2+) salt acetic acid)	Lead			1.0E-03	7421	1.0E+06	1.0E-09
7446-27-7	U145	Lead phosphate	Lead			1.0E-03	7421	1.0E+06	1.0E-09
1335-32-6	U146	Lead subacetate (Bis(acetato-O) tetrahydroxytrilead)	Lead			1.0E-03	7421	1.0E+06	1.0E-09
58-89-9	D013, F024, F039, U129	Lindane (gamma Hexachlorocyclohexane) (gamma-BHC)		2.0E-04	MCL			1.0E+06	2.0E-10
108-31-6	U147, K023, K093	Maleic anhydride (2,5-Furandione)		1.0E-01	RFD			1.0E+06	1.0E-07
123-33-1	U148	Maleic hydrazide (1,2-Dihydro-3,6-Pyridizinedione)		5.0E-01	RFD			1.0E+06	5.0E-07
109-77-3	U149	Malononitrile (Propanedinitrile)				5.0E-03	8260	1.0E+06	5.0E-09
15339-36-3	K161, P196	Manganese dimethyldithiocarbamate (bis(Dimethylcarbamodithioato-S,S')-manganese)				9.0E-04	630.1	1.0E+06	9.0E-10
148-82-3	U150	Melphalan (4-[bis(2-Chloroethyl)amino]-L-phenylalanine)	p-Phenylenediamine			1.0E-02	8270	1.0E+06	1.0E-08
7439-97-6	D009, F039, K061, K071, K088, K101, K102, K106, K175, K176, P065, P092, U151	Mercury		2.0E-03	MCL			1.0E+06	2.0E-09
628-86-4	P065	Mercury fulminate	Mercury			1.0E-04	7472	1.0E+06	1.0E-10
126-98-7	F039, U152	Methacrylonitrile (2-Methyl-2-propenitrile)		1.0E-04	RFD			1.0E+06	1.0E-10
137-42-8	K161	Metham sodium (Methylcarbamodithioic acid monosodium salt)				3.1E-03	630.1	1.0E+06	3.1E-09
67-56-1	F001, F002, F003, F004, F005, F039, K086, U154	Methanol (Methyl Alcohol)		5.0E-01	RFD			1.0E+06	5.0E-07
91-80-5	F039, U155	Methapyrilene				1.0E-01	8270	1.0E+06	1.0E-07
2032-65-7	P199	Methiocarb (3,5-Dimethyl-4-(methylthio)phenol methylcarbamate) (Mesurol)				5.0E-04	8321	1.0E+06	5.0E-10
16752-77-5	K156, K157, P066	Methomyl		2.5E-02	RFD			1.0E+06	2.5E-08
72-43-5	D014, F039, U247	Methoxychlor		4.0E-02	MCL			1.0E+06	4.0E-08
74-83-9	F039, K117, K118, K131, K132, K136, U029	Methyl bromide (Bromomethane)		1.4E-03	RFD			1.0E+06	1.4E-09
79-22-1	U156	Methyl chlorocarbonate	Chloroacetaldehyde			5.9E-04	8315	1.0E+06	5.9E-10
56-49-5	F039, U157, U171	3-Methylcholanthrene (1,2-Dihydro-3-methyl-benz [j] aceanthrylene)				1.0E-02	8270	1.0E+06	1.0E-08
101-14-4	F039, U158	4,4'-Methylenebis(2-chloroaniline)				1.0E-02	8270	1.0E+06	1.0E-08
74-95-3	F039, U068	Methylene bromide (Dibromomethane)				5.0E-03	8260	1.0E+06	5.0E-09
75-09-2	F001, F002, F003, F004, F005, F024, F025, F039, K009, K101, K086, K156, K157, K158, U080	Methylene chloride (Dichloromethane)		5.0E-03	MCL			1.0E+06	5.0E-09

CAS No.	Possible Waste Codes	Chemical Name	Reference Molecule	Land Ban LDR (mg/l)	Source	Detection Limit (L) (mg/l)	SW-846 Test Method	Maximum Wellhead Concentration, C0 (mg/l)	Concentration Reduction Factor (C/C0)
78-93-3	D035, F001, F002, F003, F004, F005, F039, K086, K156, K157, U159	Methyl ethyl ketone (MEK) (2-Butanone)		6.0E-01	RFD			1.0E+06	6.0E-07
1338-23-4	U160	Methyl ethyl ketone peroxide	MEK			5.0E-03	8260	1.0E+06	5.0E-09
60-34-4	P068	Methylhydrazine	1,2-Diphenylhydrazine			1.0E-02	8270	1.0E+06	1.0E-08
74-88-4	F039, U138	Methyl Iodide (Iodomethane)				5.0E-03	8260	1.0E+06	5.0E-09
108-10-1	F001, F002, F003, F004, F005, F039, K086, U161	Methyl isobutyl ketone (4-Methyl-2-pentanone)				2.0E-03	8015	1.0E+06	2.0E-09
624-83-9	P064	Methyl isocyanate (Isocyanatomethane)	Toluene diisocyanates			1.0E-02	8270	1.0E+06	1.0E-08
75-86-5	P069	2-Methyllactonitrile (2-Hydroxy-2-methylpropanetrile) (Acetone cyanohydrin)	Propionitrile			5.0E-03	8260	1.0E+06	5.0E-09
80-62-6	F039, U162	Methyl methacrylate (Methyl ester 2-propanoic acid)				5.0E-03	8260	1.0E+06	5.0E-09
66-27-3	F039	Methyl methanesulfonate				1.0E-02	8270	1.0E+06	1.0E-08
298-00-0	F039, P071	Methyl parathion (0,0-Dimethyl-(4-nitrophenyl)ester phosphorothioic acid)		2.5E-04	RFD			1.0E+06	2.5E-10
56-04-2	U164	Methylthiouracil (2,3-Dihydro-6-methyl 2-thioxo-4(1H)-pyrimidinone)	Propylthiouracil			1.0E-01	8270	1.0E+06	1.0E-07
1129-41-5	P190	Metolcarb (Methylcarbamic acid 3-methylphenyl ester)				3.0E-04	8321	1.0E+06	3.0E-10
315-18-4	P128	Mexacarbate (4-(Dimethylamino)-3,5-dimethyl phenol methylcarbamate (ester))				4.2E-03	8321	1.0E+06	4.2E-09
50-07-7	U010	Mitomycin C	1,4-Napthoquinone			1.0E-02	8270	1.0E+06	1.0E-08
70-25-7	U163	MNNG (N-methyl-N'-nitro-N-nitroso-guanidine)	N-Nitrosodimethylamine			1.5E-04	8070	1.0E+06	1.5E-10
2212-67-1	K159	Molinate (Hexahydro-1H-azepine-1-carbothioic acid S-ethyl ester)		2.0E-03	RFD			1.0E+06	2.0E-09
91-20-3	F024, F025, F032, F034, F037, F038, F039, K001, K019, K035, K048, K049, K051, K052, K060, K086, K087, K145, K156, U051, U165	Naphthalene				6.0E-04	8021	1.0E+06	6.0E-10
130-15-4	U166, K024	1,4-Naphthoquinone (1,4-Naphthalenedione)				1.0E-02	8270	1.0E+06	1.0E-08
134-32-7	U167	alpha-Naphthylamine (1-Naphthalenamine)				1.0E-02	8270	1.0E+06	1.0E-08
91-59-8	F039, U168	beta-Naphthylamine (2-Naphthalenamine)				1.0E-02	8270	1.0E+06	1.0E-08
86-88-4	P072	alpha-Naphthylthiourea (1-Naphthalenylthiourea)	Ethylene thiourea			1.0E-02	8270	1.0E+06	1.0E-08
7440-02-0	F006, F007, F008, F009, F011, F012, F024, F037, F038, F039, K015, K022, K028, K048, K049, K050, K051, K052, K061, K062, K083, K088, K115, K161, P073, P074	Nickel				1.0E-03	7521	1.0E+06	1.0E-09
13463-39-3	P073	Nickel carbonyl (((T-4)-Nickel carbonyl Ni(CO)4) Nickel cyanide)	Nickel			1.0E-03	7521	1.0E+06	1.0E-09
557-19-7	P074	Nickel cyanide (Nickel cyanide Ni(CN)2)	Nickel			1.0E-03	7521	1.0E+06	1.0E-09
54-11-5	P075	Nicotine (3-(1-Methyl-2-pyrrolidinyl)pyridine)				2.0E-02	8270	1.0E+06	2.0E-08
—	P075	Nicotine salts (3-(1-Methyl-2-pyrrolidinyl)pyridine salts)				2.0E-02	8270	1.0E+06	2.0E-08
10102-43-9	P076	Nitric oxide	Nitrites	1.0E-01	RFD			1.0E+06	1.0E-07
88-74-4	K101	o-Nitroaniline (2-Nitroaniline)				1.0E-02	8131	1.0E+06	1.0E-08

CAS No.	Possible Waste Codes	Chemical Name	Reference Molecule	Land Ban (HBL) (mg/l)	Source	Detection Limit (l) (mg/l)	SW-846 Target Method	Maximum Wellhead Concentration (C0) (mg/l)	Concentration Reduction Factor (C/C0)
100-01-6	F039, P077	p-Nitroaniline (4-Nitroaniline)				2.0E-02	8270	1.0E+06	2.0E-08
98-95-3	D036, F001, F002, F003, F004, F005, F039, K083, K086, K103, K104, U169	Nitrobenzene		5.0E-04	RFD			1.0E+06	5.0E-10
10102-44-0	P078	Nitrogen dioxide	Nitrites	1.0E-01	RFD			1.0E+06	1.0E-07
55-63-0	P081	Nitroglycerin (1,2,3-Propanetriol trinitrate)	2-Nitropropane			5.0E-03	8260	1.0E+06	5.0E-09
99-55-8	F039, U181	5-Nitro-o-toluidine				1.0E-02	8270	1.0E+06	1.0E-08
88-75-5	K102	o-Nitrophenol (2-Nitrophenol)				1.0E-02	8270	1.0E+06	1.0E-08
100-02-7	F039, U170	p-Nitrophenol (4-Nitrophenol)				1.3E-04	8151	1.0E+06	1.3E-10
79-46-9	F001, F002, F003, F004, F005, U171	2-Nitropropane				5.0E-03	8260	1.0E+06	5.0E-09
1116-54-7	U173	N-Nitrosodiethanolamine (2,2'-Nitrosoimino) bis ethanol		1.0E-05	RSD			1.0E+06	1.0E-11
55-18-5	F039, U174	N-Nitrosodiethylamine (Diethyl nitrosamine) (N-Ethyl-N-nitrosoethanamine)		2.0E-07	RSD			2.0E+05	1.0E-12
62-75-9	F039, P082	N-Nitrosodimethylamine (N-Methyl-N-nitroso-methanamine)		7.0E-07	RSD			7.0E+05	1.0E-12
924-16-3	F039, U172	N-Nitrosodi-n-butylamine (Dibutylnitrosamine)		6.0E-06	RSD			1.0E+06	6.0E-12
10595-95-6	F039	N-Nitrosomethylethylamine		2.0E-06	RSD			1.0E+06	2.0E-12
4549-40-0	P084	N-Nitrosomethylvinylamine (N-Methyl-N-nitroso-vinylamine)	N-Nitrosodimethylamine			1.5E-04	8070	1.0E+06	1.5E-10
59-89-2	F039	N-Nitrosomorpholine				1.0E-02	8270	1.0E+06	1.0E-08
759-73-9	U176	N-Nitroso-N-ethylurea (N-Ethyl-N-Nitrosourea)	N-Nitrosodiethylamine			2.0E-02	8270	1.0E+06	2.0E-08
684-93-5	U177	N-Nitroso-N-methylurea (N-Methyl-N-nitrosourea)	N-Nitrosodimethylamine			1.5E-04	8070	1.0E+06	1.5E-10
615-53-2	U178	N-Nitroso-N-methylurethane	N-Nitrosodimethylamine			1.5E-04	8070	1.0E+06	1.5E-10
100-75-4	F039, U179	N-Nitrosopiperidine (1-Nitroso-piperidine)				2.0E-02	8270	1.0E+06	2.0E-08
930-55-2	F039, U180	N-Nitrosopyrrolidine		2.0E-05	RSD			1.0E+06	2.0E-11
39001-02-0	F039, K174, K178	1,2,3,4,6,7,8,9-Octachlorodibenzofuran		6.0E-09	RSD (6)			6.0E+03	1.0E-12
3268-87-9	F039, K174, K178	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin		6.0E-09	RSD (6)			6.0E+03	1.0E-12
152-16-9	P085	Octamethyldiphosphoramide (Octamethylpyrophosphoramide) (Schradan)				2.0E-01	8270	1.0E+06	2.0E-07
20816-12-0	P087	Osmium oxide OsO4 (Osmium tetroxide)	Osmium			3.0E-01	7550	1.0E+06	3.0E-07
23135-22-0	P194	Oxamyl (2-(Dimethylamino)-N-[[(methylamino)carbonyl]oxy]-2-oxoethanimidothioc acid methyl ester)		2.0E-01	MCL			1.0E+06	2.0E-07
123-63-7	U182, K009, K010, K026,	Paraldehyde (2,4,6-trimethyl-1,3,5-trioxane)				2.0E-03	8015	1.0E+06	2.0E-09
56-38-2	F039, P089	Parathion (Phosphorothioic acid O,O-diethyl O-(4-nitrophenyl) ester)				6.0E-04	8141	1.0E+06	6.0E-10
1114-71-2	K159	Pebulate (Butylethyl carbamothioic acid S-propyl ester)				8.0E-04	634	1.0E+06	8.0E-10
608-93-5	F024, F025, F039, K030, K042, K085, K149, K150, K151, U183	Pentachlorobenzene		8.0E-04	RFD			1.0E+06	8.0E-10
30402-15-4	F020, F021, F022, F023, F026, F027, F028, F032, F039, K043, K099, K174, K178	Pentachlorodibenzofurans, total (PeCDF)				2.5E-05	8280	1.0E+06	2.5E-11
36088-22-9	F020, F021, F022, F023, F026, F027, F028, F032, F039, K043, K099, K174, K178	Pentachlorodibenzo-p-dioxins, total (PeCDD)				2.5E-05	8280	1.0E+06	2.5E-11

CAS No.	Possible Waste Codes	Chemical Name	Reference Molecule	Land Ban (HBL) (mg/l)	Source	Detection Limit (l) (mg/l)	SW-846 Target Method	Maximum Wellhead Concentration (C0) (mg/l)	Concentration Reduction Factor (C/C0)
76-01-7	F024, F025, K018, K028, K030, K095, K096, U184	Pentachloroethane				5.0E-03	8260	1.0E+06	5.0E-09
82-68-8	F039, U185	Pentachloronitrobenzene (PCNB)		3.0E-03	RFD			1.0E+06	3.0E-09
87-86-5	D037, F021, F022, F023, F026, F027, F028, F032, F039, K001, K043, U051	Pentachlorophenol		1.0E-03	MCL			1.0E+06	1.0E-09
—	F021, F027, F028	Pentachlorophenols and their chlorophenoxy derivative acids, esters, amines and salts	Pentachlorophenol			7.6E-05	8151	1.0E+06	7.6E-11
504-60-9	U186	1,3-Pentadiene (1-Methylbutadiene)	Chloroprene			3.0E-05	8021	1.0E+06	3.0E-11
62-44-2	F039, U187	Phenacetin (N-(4-Ethoxyphenyl) acetamide)				2.0E-02	8270	1.0E+06	2.0E-08
85-01-8	F032, F034, F037, F038, F039, K001, K015, K019, K035, K048, K049, K051, K052, K087, K088, U051	Phenanthrene				6.4E-03	8310	1.0E+06	6.4E-09
108-95-2	F032, F037, F038, F039, K001, K022, K035, K048, K049, K050, K051, K052, K060, K083, K087, K103, K104, K105, K156, K158, U188	Phenol		6.0E-01	RFD			1.0E+06	6.0E-07
—	K060,	Phenolic compounds	Phenol			1.0E-02	8270	1.0E+06	1.0E-08
25265-76-3	K083, K103, K104	Phenylenediamine (Benzenediamine)	p-Phenylenediamine			1.0E-02	8270	1.0E+06	1.0E-08
95-54-5	K157	o-Phenylenediamine	p-phenylenediamine			1.0E-02	8270	1.0E+06	1.0E-08
62-38-4	P092	Phenylmercury acetate ((Aceto-O)phenylmercury)		8.0E-05	RFD			1.0E+06	8.0E-11
103-85-5	P093	Phenylthiourea	Ethylene thiourea			1.0E-02	8270	1.0E+06	1.0E-08
298-02-2	F039, P094, K036, K037, K038, K039, K040	Phorate (Phosphorodithioic acid O,O-diethyl S-[(ethylthio)methyl] ester)				3.0E-04	8321	1.0E+06	3.0E-10
75-44-5	P095, K116	Phosgene (Carbonic dichloride)	Methylene chloride			2.0E-04	8021	1.0E+06	2.0E-10
7803-51-2	P096	Phosphine (Hydrogen phosphide)		3.0E-04	RFD			1.0E+06	3.0E-10
----	K036, K037, K038, K039, K040	Phosphorothioic and phosphordithioic acid esters	Phorate			3.0E-04	8321	1.0E+06	3.0E-10
85-44-9 (100-21-0)	F039, K023, K024, K093, K094, U190	Phthalic anhydride (1,3-Isobenzofurandione) (Terephthalic acid)		2.0E+00	RFD			1.0E+06	2.0E-06
57-47-6	P204	Physostigmine ((3aS-cis)-1,2,3,3a,8,8a-Hexahydro-1,3a,8-trimethylpyrrolo[2,3-b]indol-5-ol methylcarbamate (ester))				3.0E-04	8321	1.0E+06	3.0E-10
57-64-7	P188	Physostigmine salicylate (2-Hydroxy-benzoic acid compd. with (3aS-cis)-1,2,3,3a,8,8a-haxahydro-1-3a,8-trimethylpyrrolo[2,3-b]indol-5-yl methylcarbamate ester (1:1))				3.0E-04	8321	1.0E+06	3.0E-10
109-06-8	U191, K026	2-Picoline (2-Methylpyridine) (alpha-Picoline)				2.0E-03	8015	1.0E+06	2.0E-09

CAS No.	Possible Waste Codes	Chemical Name	Reference Molecule	Land Ban (HBL (mg/l))	Source	Detection Limit (1) (mg/l)	SW-846 Test Method	Maximum Wellhead Concentration, C0 (mg/l)	Concentration Reduction Factor (C/C0)
1336-36-3 (12674-11-2) (11104-28-2) (11141-16-5) (53469-21-9) (12672-29-6) (11097-69-1) (11096-82-5)	F039, K085	Polychlorinated Biphenyls (PCBs) (Aroclor 1016) (Aroclor 1221) (Aroclor 1232) (Aroclor 1242) (Aroclor 1248) (Aroclor 1254) (Aroclor 1260)		5.0E-04	MCL			1.0E+06	5.0E-10
151-50-8	P098	Potassium cyanide		5.0E-02	RFD			1.0E+06	5.0E-08
506-61-6	P099	Potassium silver cyanide (Potassium Bis(cyano-C-)argentate(1-))		2.0E-01	RFD			1.0E+06	2.0E-07
2631-37-0	P201	Promecarb (3-Methyl-5-(1-methylethyl)phenol methyl carbamate)				2.5E-03	8318	1.0E+06	2.5E-09
23950-58-5	F039, U192	Pronamide (Kerb) (Propyzamide) (3,5-Dichloro-N-(1,1-dimethyl-2-propynyl)benzimide)		7.5E-02	RFD			1.0E+06	7.5E-08
107-12-0	F039, P101	Propanenitrile (Propionitrile) (Ethyl cyanide)				5.0E-03	8260	1.0E+06	5.0E-09
1120-71-4	U193	1,3-Propane sultone (2,2-Dioxide 1,2-oxathiolane)	Ethylene thiourea			1.0E-02	8270	1.0E+06	1.0E-08
107-19-7	P102	Propargyl alcohol (2-Propyn-1-ol)		2.0E-03	RFD			1.0E+06	2.0E-09
122-42-9	U373	Propham (Phenylcarbamic acid 1-methylethyl ester)		2.0E-02	RFD			1.0E+06	2.0E-08
114-26-1	U411	Propoxur (2-(1-Methylethoxy)phenol methylcarbamate) (Baygon)		4.0E-03	RFD			1.0E+06	4.0E-09
107-10-8	U194	n-Propylamine (1-Propanimide)				5.0E-03	8260	1.0E+06	5.0E-09
78-87-5	F024, F039, K017, U083	Propylene dichloride (1,2-dichloropropane)		5.0E-03	MCL			1.0E+06	5.0E-09
75-55-8	P067	1,2-Propylenimine (2-methyl-aziridine)	n-Propylamine			5.0E-03	8260	1.0E+06	5.0E-09
52888-80-9	U387	Prosulfocarb (Dipropyl-carbamothioic acid S-(phenylmethyl) ester)				6.0E-04	634	1.0E+06	6.0E-10
129-00-0	F032, F034, F037, F038, F039, K001, K035, K048, K049, K051, K088, U051	Pyrene		3.0E-02	RFD			1.0E+06	3.0E-08
110-86-1	D038, F001, F002, F003, F004, F005, F039, K026, K156, K157, U196	Pyridine		1.0E-03	RFD			1.0E+06	1.0E-09
50-55-5	U200	Reserpine				3.0E-04	8321	1.0E+06	3.0E-10
108-46-3	U201	Resorcinol				1.0E-01	8270	1.0E+06	1.0E-07
81-07-2	U202	Saccharin	Safrole			1.0E-02	8270	1.0E+06	1.0E-08
---	U202	Saccharin salts	Safrole			1.0E-02	8270	1.0E+06	1.0E-08
94-59-7	F039, U203	Safrole				1.0E-02	8270	1.0E+06	1.0E-08
7782-49-2	D010, F039, K061, K088 K161, P103, P114, U204, U205	Selenium		5.0E-02	MCL			1.0E+06	5.0E-08
7746-08-4	U204	Selenium oxide (Selenium dioxide)	Selenium			2.0E-03	7741	1.0E+06	2.0E-09
7488-56-4	U205	Selenium sulfide	Selenium			2.0E-03	7741	1.0E+06	2.0E-09
7783-00-8	U204	Selenious acid (Monohydrated selenium dioxide)		5.0E-03	RFD			1.0E+06	5.0E-09
630-10-4	P103	Selenourea	Selenium			2.0E-03	7741	1.0E+06	2.0E-09
7440-22-4	D011, F006, F007, F008, F009, F011, F012, F039, K061, K088, P099, P104	Silver		5.0E-03	RFD			1.0E+06	5.0E-09
506-64-9	P104	Silver cyanide		1.0E-01	RFD			1.0E+06	1.0E-07

CAS No.	Possible Waste Codes	Chemical Name	Reference Molecule	Land Ban (HBL (mg/l))	Source	Detection Limit (1) (mg/l)	SW-846 Test Method	Maximum Wellhead Concentration, C0 (mg/l)	Concentration Reduction Factor (C/C0)
93-72-1	F027, F039, D017	Silvex (listed as 2,4,5-TP in 261; 2,4,5-TC in MERCK) (2-(2,4,5-trichlorophenoxy)-propanoic acid)		5.0E-02	MCL			1.0E+06	5.0E-08
26628-22-8	P105	Sodium azide		4.0E-03	RFD			1.0E+06	4.0E-09
143-33-9	F006, F007, F008, F009, F010, F011, F012, P106	Sodium cyanide		4.0E-02	RFD			1.0E+06	4.0E-08
18883-66-4	U206	Streptozolocin	N-Nitrosodi-methylamine			1.5E-04	8070	1.0E+06	1.5E-10
57-24-9	P108	Strychnine and strychnine salts (Strychnidin-10-one and strychnine-10-one salts)		3.0E-04	RFD			1.0E+06	3.0E-10
8496-25-8	F039	Sulfide, total				1.0E+00	9215	1.0E+06	1.0E-06
1314-80-3	U189	Sulfur phosphide (Phosphorous sulfide (R))	Phorate			3.0E-04	8321	1.0E+06	3.0E-10
93-76-5	F039	2,4,5-T ((2,4,5-Trichlorophenoxy)acetic acid)		1.0E-02	RFD			1.0E+06	1.0E-08
---	K022	Tars (Polycyclic aromatic hydrocarbons)	Dibenz (a,h)anthracene			3.0E-04	8310	1.0E+06	3.0E-10
---	F024, F025, K085	Tetrachlorobenzene	1,2,4,5-Tetrachlorobenzene	3.0E-04	RFD (3)			1.0E+06	3.0E-10
95-94-3	F039, K019, K030, K042, K085, K149, K150, K151, U207	1,2,4,5-Tetrachlorobenzene		3.0E-04	RFD			1.0E+06	3.0E-10
51207-31-9	F020, F021, F022, F023, F026, F027, F028, F032, F039, K043, K099	Tetrachlorodibenzofurans				1.0E-05	8280	1.0E+06	1.0E-11
55722-27-5	K174, K178	Tetrachlorodibenzofurans (All TCDFs)				1.0E-05	8280	1.0E+06	1.0E-11
1746-01-6	F020, F021, F022, F023, F026, F027, F028, F032, F039, K043, K099	Tetrachlorodibenzo-p-dioxins (TCDD)		3.0E-08	MCL			3.0E+04	1.0E-12
41903-57-5	K174, K178	Tetrachlorodibenzo-p-dioxins (TCDD)		3.0E-08	MCL			3.0E+04	1.0E-12
630-20-6	F024, F025, F039, K019, K020, K028, K030, K095, K096, U208	1,1,1,2-Tetrachloroethane		1.0E-03	RSD			1.0E+06	1.0E-09
79-34-5	F024, F025, F039, K019, K020, K028, K030, K073, K095, K096, K150, U209	1,1,2,2-Tetrachloroethane		2.0E-04	RSD			1.0E+06	2.0E-10
127-18-4	D039, F001, F002, F003, F004, F005, F024, F025, F039, K016, K019, K020, K028, K030, K043, K073, K095, K096, K116, K150, K151, U210	Tetrachloroethylene (Tetrachloroethene) (Perchloroethylene)		5.0E-03	MCL			1.0E+06	5.0E-09
58-90-2	F020, F021, F022, F023, F026, F027, F028, F032, F039, K001, K043	2,3,4,6-Tetrachlorophenol		3.0E-02	RFD			1.0E+06	3.0E-08
---	F020, F023, F027, F028, K001	Tetrachlorophenols and their chlorophenoxy derivative acids, esters, amines and salts	2,4,6 Trichlorophenol			1.0E-02	8270	1.0E+06	1.0E-08
3689-24-5	P109	Tetraethyldithiopyrophosphate (Tetraethyl ester thiodiphosphoric acid)		5.0E-04	RFD			1.0E+06	5.0E-10
78-00-2	P110	Tetraethyl lead (Tetraethyl-plumbane)		1.0E-07	RFD			1.0E+05	1.0E-12
107-49-3	P111	Tetraethyl pyrophosphate (Tetra ester diphosphoric acid)				4.0E-02	8270	1.0E+06	4.0E-08
109-99-9	U213	Tetrahydrofuran	4-Methyl-2-pentanone			2.0E-03	8015	1.0E+06	2.0E-09
509-14-8	P112	Tetranitromethane	2-Nitropropane			5.0E-03	8260	1.0E+06	5.0E-09

CAS No.	Possible Waste Codes	Chemical Name	Reference Molecule	Land Ban HBL (mg/l)	Source	Detection Limit (l) (mg/l)	SW-846 Test Method	Maximum Wellhead Concentration, C0 (mg/l)	Concentration Reduction Factor (C/C0)
1314-32-5	P113	Thallic oxide	Thallium			1.0E-03	7841	1.0E+06	1.0E-09
7440-28-0	F039, K061, K178, P113, P115, U214, U215, U216, U217	Thallium		2.0E-03	MCL			1.0E+06	2.0E-09
563-68-8	U214	Thallium(I) acetate		9.0E-05	RFD			1.0E+06	9.0E-11
6533-73-9	U215	Thallium(I) carbonate		8.0E-05	RFD			1.0E+06	8.0E-11
7791-12-0	U216	Thallium(I) chloride		8.0E-05	RFD			1.0E+06	8.0E-11
10102-45-1	U217	Thallium(I) nitrate		9.0E-05	RFD			1.0E+06	9.0E-11
12039-52-0	P114	Thallium selenite (Dithallium(1+)salt selenious acid)	Thallium			1.0E-03	7841	1.0E+06	1.0E-09
7446-18-6	P115	Thallium(I) sulfate (Dithallium(1+)salt sulfuric acid)		8.0E-05	RFD			1.0E+06	8.0E-11
62-55-5	U218	Thioacetamide (Ethanethionmide)	Ethylene thiourea			1.0E-02	8270	1.0E+06	1.0E-08
59669-26-0	U410	Thiodicarb (N,N'-[Thiobis[(methylimino)carbonyloxy]]bisethanimidothioic acid dimethyl ester)				3.0E-04	8321	1.0E+06	3.0E-10
39196-18-4	P045	Thiofanox				3.0E-04	8321	1.0E+06	3.0E-10
74-93-1	U153	Thiomethanol (Methanethiol)	Ethylene thiourea			1.0E-02	8270	1.0E+06	1.0E-08
541-53-7	P049	Thiomidodicarbonic dimide (2,4-Dithiobiuret)	Ethylene thiourea			1.0E-02	8270	1.0E+06	1.0E-08
23564-05-8	U409	Thiophanate-methyl ([1,2-Phyenylenebis(iminocarbonothioyl)] biscarbamic acid dimethyl ester)		8.0E-02	RFD			1.0E+06	8.0E-08
108-98-5	P014	Thiophenol (Benzenethiol)				2.0E-02	8270	1.0E+06	2.0E-08
79-19-6	P116	Thiosemicarbazide (Hydrazinecarbothioamide)	1,2-diphenylhydrazine			1.0E-02	8270	1.0E+06	1.0E-08
62-56-6	U219	Thiourea				1.0E-02	8270	1.0E+06	1.0E-08
137-26-8	U244	Thiram (Tetramethylthioperoxydicarbonic diamide)		5.0E-03	RFD			1.0E+06	5.0E-09
26419-73-8	P185	Tirpate (2,4-Dimethyl-1,3-dithiolane-2-carboxaldehyde O-[(methylamino)carbonyl]oxime)				3.0E-04	8321	1.0E+06	3.0E-10
108-88-3	F001, F002, F003, F004, F005, F024, F025, F037, F038, F039, K001, K015, K022, K036, K037, K048, K049, K051, K052, K086, K087, K149, K151, K156, U051, U220	Toluene (Methyl benzene)		1.0E+00	MCL			1.0E+06	1.0E-06
25376-45-8	U221	Toluenediamine (all isomers)	Toluene-2,4-diamine			2.0E-02	8270	1.0E+06	2.0E-08
95-80-7	K112, K113, K114, K115, K027, U221	Toluene-2,4-diamine (2,4-Diaminotoluene)				2.0E-02	8270	1.0E+06	2.0E-08
26471-62-5 (584-84-9)	U223, K027	Toluene diisocyanate				1.0E-02	8270	1.0E+06	1.0E-08
95-53-4	U328, K112, K113, K114	o-Toluidine				2.0E-03	8015	1.0E+06	2.0E-09
636-21-5	U222	o-Toluidine hydrochloride	o-Toluidine			2.0E-03	8015	1.0E+06	2.0E-09
106-49-0	U353, K112, K113, K114	p-Toluidine	o-Toluidine			2.0E-03	8015	1.0E+06	2.0E-09
8001-35-2	D015, F039, P123, K041, K098	Toxaphene		3.0E-03	MCL			1.0E+06	3.0E-09
2303-17-5	U389	Triallate (bis(1-Methylethyl)carbamothioic acid S-(2,3,3-trichloro-2-propenyl) ester)		1.3E-02	RFD			1.0E+06	1.3E-08
118-79-6	K140, U408	2,4,6-Tribromophenol	Acenaphthene			1.0E-02	8270	1.0E+06	1.0E-08
75-87-6	U034	Trichloroacetaldehyde (Chloral)		2.0E-03	RFD			1.0E+06	2.0E-09
108-70-3	K085	Trichlorobenzene (1,3,5-Trichlorobenzene)				1.2E-04	8121	1.0E+06	1.2E-10

CAS No.	Possible Waste Codes	Chemical Name	Reference Molecule	Land Ban HBL (mg/l)	Source	Detection Limit (l) (mg/l)	SW-846 Test Method	Maximum Wellhead Concentration, C0 (mg/l)	Concentration Reduction Factor (C/C0)
120-82-1	F024, F025, F039, K019, K030, K042, K085, K096, K150	1,2,4-Trichlorobenzene		7.0E-02	MCL			1.0E+06	7.0E-08
71-55-6	F001, F002, F003, F004, F005, F024, F025, F039, K018, K019, K020, K028, K029, K073, K086, K096, U226	1,1,1-Trichloroethane (Methyl chloroform)		2.0E-01	MCL			1.0E+06	2.0E-07
79-00-5	F001, F002, F003, F004, F005, F024, F025, F039, K019, K020, K028, K073 K095, K096, U227	1,1,2-Trichloroethane		5.0E-03	MCL			1.0E+06	5.0E-09
79-01-6	D040, F001, F002, F003, F004, F005, F024, F025, F039, K018, K019, K020, K086, K095, K096, U228	Trichloroethylene (Trichloroethene)		5.0E-03	MCL			1.0E+06	5.0E-09
75-69-4	F001, F002, F003, F004, F005, F039, U121	Trichlorofluoromethane (Trichloromonofluoromethane)		3.0E-01	RFD			1.0E+06	3.0E-07
75-70-7	P118	Trichloromethanethiol	Chloroform			2.0E-04	8021	1.0E+06	2.0E-10
95-95-4	D041, F020, F021, F022, F023, F026, F027, F028, F039, K001, K043, K105	2,4,5-Trichlorophenol		1.0E-01	RFD			1.0E+06	1.0E-07
88-06-2	D042, F020, F021, F022, F023, F026, F027, F028, F032, F039, K001, K043, K099, K105	2,4,6-Trichlorophenol		3.0E-03	RSD			1.0E+06	3.0E-09
—	F020, F023, F027, F028, K001	Trichlorophenols and their chlorophenoxy derivative acids, esters, amines and salts	2,4,6-Trichlorophenol			1.0E-02	8270	1.0E+06	1.0E-08
598-77-6	K017	1,1,2 Trichloropropane		5.0E-03	RFD			1.0E+06	5.0E-09
96-18-4	F039, K017	1,2,3-Trichloropropane		6.0E-03	RFD			1.0E+06	6.0E-09
76-13-1	F001, F002, F003, F004, F005, F039,	1,1,2-Trichloro-1,2,2-trifluoroethane		3.0E+01	RFD			1.0E+06	3.0E-05
121-44-8	K156, K157, U404	Triethylamine (N,N-Diethylethanamine)				5.0E-04	8260	1.0E+06	5.0E-10
99-35-4	U234	1,3,5-Trinitrobenzene		3.0E-02	RFD			1.0E+06	3.0E-08
72-57-1	U236	Trypan blue	Aminoazobenzene			1.0E-02	8270	1.0E+06	1.0E-08
66-75-1	U237	Uracil mustard (5-[Bis(2-chloroethyl)amino]-2,4-(1H,3H)-pyrimidinedione)	Propylthiouracil			1.0E-01	8270	1.0E+06	1.0E-07
7440-62-2	F039, P119, P120	Vanadium				4.0E-03	7911	1.0E+06	4.0E-09
1314-62-1	P120	Vanadium pentoxide (Vandium oxide V2O5)		9.0E-03	RFD			1.0E+06	9.0E-09
1929-77-7	K159	Vernolate (Dipropylcarbamothioic acid S-propyl ester) (Vernam)		1.0E-03	RFD			1.0E+06	1.0E-09
75-01-4	D043, U043, F024, F025, F039, K019, K020, K028, K029	Vinyl chloride (Chloroethylene) (Chloroethene)		2.0E-03	MCL			1.0E+06	2.0E-09
81-81-2	U248	Warfarin and salts when present at concentrations <= 0.3%		3.0E-04	RFD			1.0E+06	3.0E-10
81-81-2	P001	Warfarin and salts when present at concentrations > 0.3%		3.0E-04	RFD			1.0E+06	3.0E-10
1330-20-7	F001, F002, F003, F004, F005, F037, F038, F039, K001, K048, K049, K051, K052, K086, K087, U051, U239	Xylene (Dimethylbenzene)		1.0E+01	MCL			1.0E+06	1.0E-05

CAS No.	Possible Waste Codes	Chemical Name	Reference Molecule	Land Ban HBL (mg/l)	Source	Detection Limit (1) (mg/l)	SW-846 Test Method	Maximum Wellhead Concentration, C0 (mg/l)	Concentration Reduction Factor (C/C0)
7440-66-6	K061	Zinc		3.0E-01	RFD			1.0E+06	3.0E-07
557-21-1	P121	Zinc cyanide (Zinc cyanide Zn(CN)2)		5.0E-02	RFD			1.0E+06	5.0E-08
1314-84-7	U249	Zinc phosphide when present at concentrations <= 10%.		3.0E-04	RFD			1.0E+06	3.0E-10
1314-84-7	P122	Zinc phosphide when present at concentrations > 10%.		3.0E-04	RFD			1.0E+06	3.0E-10
137-30-4	K161, P205	Ziram (bis(Dimethylcarbamodithioato-S,S')zinc (T-4))				1.9E-03	630	1.0E+06	1.9E-09

Footnotes:
(1) The Practical Quantitation Limit (PQL) was employed when available, using a ground water matrix.

(2) Used MCL for fluoride.

(3) Based on toxicological information that 1,2,4,5- tetrachlorobenzene is the most toxic of the three isomers, its RFD is assumed to be applicable to all isomers.

(4) Used detection limit for Total HpCDF and Total HpCDD

(5) Used RSD for 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin

(6) No land-ban HBL concentration available. Used RSD for 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin because it is the lowest land-ban available for dioxins in this table.

Notes:
HBL taken from MCL, lower of RFD/RSD, detection, or surrogate detection limit in this order of preference.
MCL - Maximum Contaminant Level
RFD - Reference Dose
RSD - Risk Specific Dose

MCL taken from Drinking Water Regulations and Health Advisories, 10/96.

RFD and RSD taken from IRIS, 3/97.