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October 23, 2002

Paul Lohaus, Director
Office of State and Tribal Programs
Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Via Federal Express

Dear Mr. Lohaus:

The Utah Division of Radiation Control (UDRC) is preparing to submit a final application to amend the present Agreement with the Nuclear Regulatory Commission (NRC) to allow UDRC to regulate uranium mills and tailings in the State of Utah. Prior to submission of the final application, UDRC is providing NRC with documents pertaining to how UDRC would regulate the groundwater aspect of the amended Agreement. As you are aware, UDRC intends to substitute the Utah Administrative Rules for Ground Water Quality Protection, R317-6 for groundwater standards provided in Appendix A, 10 CFR Part 40 (EPA Rules 40 CFR Part 192). In support of this substitution, UDRC has prepared the following document for NRC review and comment:

(1) Enclosure 1 - Summary of the process used to determine of how to best regulate groundwater at Utah uranium mill facilities;
(2) Enclosure 2 - Executive Summary - Comparison of NRC Groundwater Protection Criteria in 10 CFR Part 40, Appendix A with Utah Ground Water Quality Protection Rules (UAC R317-6)
(3) Enclosure 3 - Detailed Comparison of NRC Groundwater Protection Criteria in 10 CFR Part 40, Appendix A with Utah Ground Water Quality Protection Rules (UAC R317-6)

We are providing you with the above information to ensure NRC that the proposed Utah program is equivalent to the comparable NRC groundwater program under Appendix A, 10 CFR Part 40 (EPA Rules 40 CFR Part 192). We believe that although we may use different terminology on occasion or may have a different regulatory process approach on an issue, the end result, protection of the groundwater resource, is achieved under both programs.

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We are also aware of a provision of the Uranium Mill Tailings Radiation Control Act which specifies that an "alternate standard" may need to be approved by the NRC if a state chooses a different path regarding groundwater regulation. As such, we are requesting a determination of a regulatory and process path forward to facilitate Utah's request. We appreciate your help and consideration of this important matter. If you have questions or I can be of further assistance, please do not hesitate to contact me.

Sincerely,

William J. Sinclair, Director

# Enclosure 1 - Description of the Proposed Utah Groundwater Program for Uranium Mills and Tailings

**Description of the proposed Utah Groundwater Program for uranium mills and tailings**
**Utah Division of Radiation Control**
**October 2002**

Prior to submitting a draft application to the Nuclear Regulatory Commission (NRC), the Department of Environmental Quality (DEQ), Divisions of Radiation Control and Water Quality convened stakeholders to examine the issue of Agreement State status and specifically, how to best address the "groundwater authority" issue. The stakeholders reached consensus that the groundwater program was best addressed by use of the current Utah program. A major issue for stakeholders was to assure consistency of groundwater regulation throughout the state of Utah and among the variety of permit holders. The Stakeholders' group consisted of representatives of the four impacted facilities (Envirocare, International Uranium, Plateau Resources, and Rio Algom), county elected officials (Tooele and San Juan County), DEQ Boards representatives from Radiation Control and Water Quality Board, and representatives of the Division of Radiation Control and the Division of Water Quality. The entire Stakeholder work effort is found at: http://www.deq.state.ut.us/EQRAD/MILLS/ATLAS/Deq_task.htm

The Division of Radiation Control (DRC) intends to administer both the groundwater permitting and radioactive material licensing for disposal facilities and uranium mills. Facilities will have both a groundwater discharge permit and radioactive materials license issued by DRC staff. Two facilities already have state groundwater discharge permits, Envirocare and Plateau Resources. International Uranium is in the process of obtaining a state groundwater discharge permit. International Uranium is also complying with a state Corrective Action Order to investigate a non-radiologic release at the White Mesa Mill.

The permit and enforcement process has been made efficient by utilizing existing provisions of the Utah Water Quality Act which allows the Water Quality Board and Executive Director to designate the Director of the Division of Radiation Control as a Co-Executive Secretary to administer provisions of the Water Quality Act for the identified facilities [see Utah Code Annotated (UCA) 19-5-106 and 19-5-104 (1),(k)]. The DRC Director has been designated as a Co-Executive Secretary of the Water Quality Board and given legal authority to issue, administer, and enforce specific groundwater permits under the Utah Water Quality Rule UCA R317-6 as applied to the following facilities: Envirocare, Rio Algom, International Uranium Corporation, and Plateau Resources Limited, and as allowed under the provisions of UCA 19-5-104(1)(k).

No separate involvement of the DEQ Division of Water Quality staff is required although they are available to consult with the DRC Director regarding interpretation of rules and other technical or procedural matters relating to groundwater protection. Appeals of enforcement proceedings and permit issues relating to groundwater would be through the Utah Water Quality Board. The Division has substituted the Administrative Rules for Ground Water Quality

Protection, R317-6 for groundwater standards provided in Appendix A, 10 CFR Part 40 (EPA Rules 40 CFR Part 192).

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Enclosure 2 - Executive Summary - Comparison of NRC Groundwater Protection Criteria in 10 CFR Part 40, Appendix A With Utah Ground Water Quality Protection Regulations (UAC R317-6)

Executive Summary - Comparison of NRC Groundwater Protection Criteria in 10 CFR Part 40, Appendix A
With Utah Ground Water Quality Protection Regulations (UAC R317-6)

| NRC Criterion | Rule Comparability |
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| Definitions | Aquifer - The State definition is essentially equivalent.<br>Compliance period - Although the mechanics vary, the State provides an equivalent approach.<br>Ground water - The State definition is equivalent.<br>Leachate - The term is not directly defined in the State rule. However, State practice is to ensure control of the discharge of leachates through issuance of Construction and discharge permits (see discussion for "liners" below)<br>Liners - This term is not directly defined in the State Groundwater Discharge Permit (GWDP) rule. However, in practice, liners are carefully examined during the course of issuance of both State construction and discharge permits<br>Point of compliance - The State definition is equivalent.<br>Uppermost aquifer - Equivalent definitions are found in two other State terms (see discussion of "aquifer" in full comparison document) |
| Criterion 5B(1) | Although the mechanics differ, the State rule provides an equivalent measure of protection for the groundwater resource |
| Criterion 5B(2)(a)(b)(c) | The State rule is equivalent in its requirements for source term characterization under Criterion 5B(2)(a). No predetermined list of contaminants is specified in the Utah Groundwater Quality Protection (GWQP) Rules. However, the approach provides that:<br>(1) Groundwater Quality Standards (GWQS) can be determined by the Executive Secretary a priori before a |

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| Criterion 5B(2)(a)(b)(c) [continued] | contaminant pollutes the water table aquifer, and<br>(2) Executive Secretary can use the Criterion 13 list as a guide in combination with specific source characterization information provided by the Permit applicant to determine the type and number of GWQS and Groundwater Protection levels (GWPLs) necessary for a permit or corrective action plan. The State approach allows flexibility beyond the Criterion 13 list to determine site-specific GWQS on other pollutants know to be toxic or cause health or environmental harm, or established by other accepted regulatory, research, or governmental agencies. |
| Criterion 5B(3) | Minor differences exist in the State wording. However, the objectives of the Permit application needs and the Contaminant Investigation Report (CIR) and Corrective Action Plan (CAP) requirements for groundwater cleanup; plus the capability of the Executive Secretary to require the additional actions and data gathering all combine to provide an equivalent degree of protection of groundwater resources. |
| Criterion 5B(4) | The State rules provide steps to identify underground sources of drinking water through the groundwater classification process. This process is a major underpinning to the State permit issuance and groundwater corrective action programs. The State groundwater classification system provides protection for some limited groundwater resources that could be considered "exempted" from protection under EPA rules. |
| Criterion 5B(5) | Although the State/NRC mechanics differ somewhat, the overall objective in the State rules is equivalent. |
| Criterion 5B(6) | Equivalent requirements are found in the State rules, in that the owner/operator is required to demonstrate that practicable corrective actions have been applied and the ACL poses no risk to human health or the environment. The |

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| Criterion 5B(6) [continued] | detailed technical factors that must be considered under the NRC requirements are also adequately addressed by the State rules. |
| Criterion 5C | The differences seen in the concentration limits adopted for groundwater protection under the State rules (GWQS) are due to the fact that the State has stayed abreast of the EPA changes to drinking water MCL values. |
| Criterion 5D | The State rules are equivalent in purpose and objective to the NRC Criterion 5D requirements. While the State process does not include an 18-month deadline for the owner/operator to implement a groundwater corrective action plan, a similar time period transpires during submittal of a contaminant investigation report followed by a corrective action plan. If necessary, an enforcement order ensures any obligations that need to be met are accomplished. |
| Criterion 5E | The State rules and practice in determining if a discharge facility has incorporated best available control technology (BAT) are consistent and equivalent to all the groundwater protection program considerations in NRC Criterion 5E |
| Criterion 5F | The State rules and agency practice are equivalent to the NRC requirement |
| Criterion 5G | The State rules and agency practice are equivalent to NRC requirements for Criterion 5G. |
| Criterion 5H | The State rules are equivalent to the NRC requirement |
| Criterion 7A | Detection monitoring: The State rules and practice allow the establishment of a groundwater detection monitoring program that is equivalent to the NRC requirement.<br>License issuance: The State rule is equivalent to this NRC requirement.<br>Compliance monitoring: The State rule is more protective of |

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| Criterion 7A (continued) | the groundwater resource, the GWPL concept provides early warning of a release before exceedance of the applicable GWQS.<br><br>Corrective action: The State rules in question are equivalent to the NRC requirement. |
| Criterion 13 | The flexibility of the State rules allow the Executive Secretary to tailor the groundwater monitoring parameters, determine appropriate GWQS and GWPLs, and set groundwater cleanup compliance concentration levels based on the individual waste source term characteristics of each disposal site. NRC Criterion 13 contaminants may be used as a guide in this process |

Enclosure 3 - Comparison of Several NRC Groundwater Protection Criteria in 10 CFR Part 40, Appendix A with Utah Ground Water Quality Protection Regulations (UAC R317-6)

# Comparison of Several NRC Groundwater Protection Criteria in 10 CFR 40, Appendix A with Utah Ground Water Quality Protection Regulations (UAC R317-6)

| NRC Citation | NRC Regulatory Language | Discussion of Equivalent Utah Statutory Authority and/or Rules |
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| Definitions | *"Aquifer" means a geologic formation, group of formations, or part of a formation capable of yielding a significant amount of ground water to wells or springs. Any saturated zone created by uranium or thorium recovery operations would not be considered an aquifer unless the zone is or potentially is (1) hydraulically interconnected to a natural aquifer, (2) capable of discharge to surface water, or (3) reasonably accessible because of migration beyond the vertical projection of the boundary of the land transferred for long-term government ownership and care in accordance with Criterion 11 of this appendix.* | A similar definition is found in the State Ground Water Quality Protection (GWQP) Rules, Utah Administrative Code (UAC) R317-6-1.1: *"Aquifer" means a geologic formation, group of geologic formations or part of a geologic formation that contains sufficiently saturated permeable material to yield usable quantities of water to wells and springs.*<br><br>Editorial Note: the State definition intentionally avoids specifying a minimum aquifer yield value in order to protect all useable groundwater resources, including both current and future sources. As the second-most arid State in the nation, Utah has a unique need to protect many small public water supply systems that draw on low-yielding seeps and springs for public drinking water. In some cases these small water companies capture and combine groundwater flow from several low yielding seeps and springs to provide sufficient drinking water for a local community.<br><br>With regards to artificial mounds of groundwater created by spills, releases, or other wastewater discharges, found in subsurface intervals that previously were unsaturated, the Utah Water Quality Act (WQA) provides that such wastewaters are privately owned industrial process waters, and not "Waters of the State", should they meet the following statutory requirements [see Utah Code Annotated [UCA] 19-5-102(18)(a and b)]:<br>1. Retained on Private Property – meaning "*...confined to or retained within the limits of private property,...*" This means the use of active hydraulic control to prevent the wastewater from leaving the physical boundaries of the property owned by the Permittee, and<br>2. Lack of Adverse Impact – the wastewater discharged to the subsurface does not "*...develop into or constitute a nuisance, a public health hazard, or a menace to fish or wildlife.*"<br><br>Under these circumstances, the State GWQP rules would not apply to the artificial zone of saturation created by the facility. However, should the artificial mound leave the property boundaries, or contain contaminants in excess of the State Ground Water Quality Standards (GWQS), said groundwater is subject to regulation by the State.<br><br>**Rule Comparability:** the State definition is essentially equivalent. |
| | *"Compliance period" begins when the Commission sets secondary ground-water protection standards and ends when the owner or operator's license is terminated and the site is transferred to the State or Federal agency for long-term care.* | This specific term is currently undefined in the State GWQP Rules. However, two (2) sections of the State rule apply to this concept. Under R317-6-6.1(A) and (B), a facility that "*...discharges or would probably result in a discharge of pollutants that may move directly or indirectly into ground water...*" is required to obtain a Ground Water Quality Discharge Permit (hereafter Permit) from the Executive Secretary. Upon issuance of the Permit, the owner/operator is required to comply with the State GWQP Rules, as implemented by the Permit. Thereafter, the Permit continues in force until the Executive Secretary determines that circumstances at the facility have changed such that the operation poses "*...a de minimus actual or potential effect on ground water quality.*" [R317-6-6.2(A) and (A)(25)]. If at facility closure, the Executive Secretary finds groundwater quality at the site to be at concentrations that are less than or equal to the State GWQS, then the facility would be determined to meet the "de-minimus" criterion referenced above, and the Permit terminated. At that point, the radioactive material license would also be terminated, and the facility transferred to the DOE general license.<br><br>**Rule Comparability:** although the mechanics vary, the State approach is equivalent. |

| NRC Citation | NRC Regulatory Language | Discussion of Equivalent Utah Statutory Authority and/or Rules |
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| | *"Ground water" means water below the land surface in a zone of saturation. For purposes of this appendix, ground water is the water contained within an aquifer as defined above.* | A similar definition is found in the State GWQP Rules, as follows (R317-6-1.19): *"Ground Water" means subsurface water in the zone of saturation including perched ground water.*<br><br>**Rule Comparability:** the State definition is equivalent. |
| | *"Leachate" means any liquid, including any suspended or dissolved components in the liquid, that has percolated through or drained from the byproduct material.* | This term is used extensively in the State GWQP rules without a formal regulatory definition. Many times it is used interchangeably with the term "effluent" (R317-6-1.28, R317-6-6.2(A)(1), and R317-6-6.3(F)]. However, this term may also be encompassed by the State definition for "pollution", which is "*...contamination, or other alteration of the physical, chemical, or biological properties of any waters of the State, or such discharge of any liquid, gaseous, or solid substance into any waters of the state as will create a nuisance or render such waters harmful or detrimental or injurious to public health, safety, or welfare, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or to livestock, wild animals, birds, fish or other aquatic life.*" (R317-6-1.30).<br><br>**Rule Comparability:** this term is not directly defined in the State rule. However, State practice is to ensure control of the discharge of leachates thru issuance of Construction and discharge permits (see discussion for "liner", below). |
| | *"Liner" means a continuous layer of natural or man-made materials, beneath or on the sides of a surface impoundment which restricts the downward or lateral escape of byproduct material, hazardous constituents, or leachate.* | This specific term is not used in the State GWQP Rules in order that the rules to apply to many different types of waste or wastewater discharge sources, including waste impoundments, pipe discharges of wastewater, among others. Instead, generic reference is made in the State rules to a "discharge" which is defined as"*...the release of a pollutant directly or indirectly into subsurface waters of the state*" (R317-6-1.13). Another State term is also applicable, "point of discharge", which "*...means the area within outermost location at which effluent or leachate has been stored, applied, disposed of, or discharged; for a diked facility, the outermost edge of the dikes*" (R317-6-1.28). Accordingly, the discharge to the subsurface and to Waters of the State could be through a liner under a waste or wastewater impoundment facility. Said liner could be made of earthen or man-made materials.<br><br>Under the State WQA, an owner / operator is required to first secure a Permit before operating a Treatment Works [UCA 19-5-107(3)]. In turn, the Executive Secretary reviews engineering plans and specifications for Treatment Works and issues Construction Permits [UCA 19-5-104(1)(h)]. During the course of this review the design and construction of proposed liner systems is carefully examined. The purpose of the liner system is to prevent and/or abate the seepage discharge that must be controlled to be in compliance with the State GWQP rules.<br><br>In addition, the GWQP Rules also require the Permittee to provide information to demonstrate how the discharge will be controlled and not migrate into or adversely effect the quality of Waters of the State, including both ground water and surface water [R317-6-6.3(G)]. The design and construction of liner systems is central to this goal.<br><br>**Rule Comparability:** this term is not directly defined in the State GWQP rule. However, in practice liners are carefully examined during the course of issuance of both State Construction and discharge Permits. |
| | *"Point of compliance" is the site specific location in the uppermost aquifer where the ground-water protection standard must be met.* | A similar definition is found in the State GWQP Rules for Compliance Monitoring Point (CMP), which is defined as "...a well, seep, spring, or other sampling point used to determine compliance with applicable permit limits" (R317-6-1.10). Another citation in the State GWQP Rules requires that the CMP be located as close as practicable to the point of discharge ... and within the property boundaries owned by the facility [R317-6-6.9(A)]. This same section of the rules allows the Executive Secretary to require that the State GWQS be met at the CMP.<br><br>**Rule Comparability:** the State definition is equivalent. |

| NRC Citation | NRC Regulatory Language | Discussion of Equivalent Utah Statutory Authority and/or Rules |
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| | *"Uppermost aquifer" means the geologic formation nearest the natural ground surface that is an aquifer, as well as lower aquifers that are hydraulically interconnected with this aquifer within the facility's property boundary.* | This specific term is not used in the State GWQP Rules. However, two other related terms are defined, including:<br>*"Water Table" means the top of the saturated zone of a body of unconfined ground water at which the pressure is equal to that of the atmosphere.* (R317-6-1.39), and<br>"Water Table Aquifer" means an aquifer extending downward from the water table to the first confining bed. (R317-6-1.40). For additional information see discussion on the definition of "aquifer", above.<br><br>**Rule Comparability:** equivalent definitions are found in two other State terms. |
| Criterion 5B(1) | *Uranium and thorium byproduct materials must be managed to conform to the following secondary ground-water protection standard: Hazardous constituents entering the ground water from a licensed site must not exceed the specified concentration limits in the uppermost aquifer beyond the point of compliance during the compliance period.* | The Utah Ground Water Quality Protection (GWQP) Rules also mandate that groundwater quality at the compliance monitoring point must not exceed the State Ground Water Quality Standards (GWQS) while a discharge Permit is required. This mandate is the product of both statutory requirements provided in the Utah Water Quality Act (WQA), and the Utah GWQP Rules promulgated therefrom, as outlined below:<br><br>WQA Citations (UCA 19-5):<br>19-5-107(1)(a): provides that it is unlawful to discharge pollutants into Waters of the State, or to directly or indirectly place wastes where they may cause ground or surface water pollution.<br>19-5-102(18): defines all groundwater, including the uppermost aquifer, and surface water as Waters of the State,<br>19-5-102(3): defines discharge as the addition of any pollutant to any Waters of the State.<br>19-5-102(10): defines pollution as man-made alteration of the quality of Waters of the State, including among others, radiological changes.<br>19-5-102(17): defines waste or pollutant as the discharge of various types of waste into water.<br>19-5-107(3)(b): requires an owner / operator to first secure a Permit from the Executive Secretary before operating a "treatment works"*.<br>19-5-102(14): defines Treatment Works, as facilities used to treat, stabilize, or hold wastes*<br>19-5-104(1)(e): empowers the Utah Water Quality Board (hereafter Board) to adopt Standards of quality for Waters of the State, and classify said waters, for the prevention, control, and abatement of pollution.<br>19-5-104(1)(h): empowers the Board to review engineering plans and specifications and issue construction permits for Treatment Works.<br>19-5-104(1)(i): empowers the Board to issue, revoke, modify, or deny discharge Permits to prevent or control discharge of pollutants and wastes into Waters of the State (after public notice and opportunity for public hearing).<br><br>* = Similar requirements are found in the GWQP Rules for waste disposal sites, including mining and milling operations [R317-6-6.1(A) and(B)].<br><br>Editorial Note: in practice the Executive Secretary issues both the Construction Permit and the Groundwater Quality Discharge Permit concurrently as a single document. Both regulatory instruments work together in tandem to govern the construction, operation, maintenance, monitoring, and closure of a facility in order to protect local groundwater resources.<br><br>GWQP Rule Citations (Utah Administrative Code R317-6):<br>R317-6-1.1: defines aquifer as geologic formation(s), or parts thereof that are sufficiently saturated to yield useable quantities of water to wells and springs.<br>R317-6-1.20: defines State Ground Water Quality Standards (GWQS) as concentration levels adopted for the protection of groundwater quality. |

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| | | R317-6-1.10. defines Compliance Monitoring Point (CMP) as a well, or other sampling point used to determine compliance with Permit limits.<br>R317-6-4: defines Ground Water Protection Limits (GWPLs) that are groundwater monitoring concentration limits used at Permitted facilities, and are assigned as a fraction of the GWQS. The determination of these limits vary according to background groundwater class, and are used as an early warning mechanism to protect groundwater quality.<br>R317-6-6.16(B): mandates that out-of-compliance status exists for a facility when 2 consecutive groundwater quality samples from a CMP exceed the Permit limit (GWQS or GWPL) and the background groundwater concentration by a statistically significant measure (e.g. 2 standard deviations).<br><br>**Rule Comparability:** although the mechanics differ, the State rule provides an equivalent measure of protection for the groundwater resource. |
| | *Hazardous constituents are those constituents identified by the Commission pursuant to paragraph 5B(2) of this criterion. Specified concentration limits are those limits established by the Commission as indicated in paragraph 5B(5) of this criterion.* | Equivalent to this requirement, the Ground Water Quality Standards (GWQS) were adopted by the Utah Water Quality Board (hereafter Board) for the protection of groundwater quality in Utah (R317-6-1.20). Said GWQS include specific groundwater quality contaminants and concentration limits (R317-6-2.1). In a like manner, the Executive Secretary can determine ad hoc GWQS for a facility on a case-by-case basis during issuance of a Permit (R317-6-2.2).<br><br>**Rule Comparability:** equivalent capability exists to set ad hoc protections standards for groundwater quality. |
| | *The Commission will also establish the point of compliance and compliance period on a site specific basis through license conditions and orders. The objective in selecting the point of compliance is to provide the earliest practicable warning that the impoundment is releasing hazardous constituents to the ground water. The point of compliance must be selected to provide prompt indication of ground-water contamination on the hydraulically downgradient edge of the disposal area.* | In a similar fashion, the State rules specify compliance monitoring points, which are:<br>1. Wells or other sampling points, determined on a facility specific basis, used to determine compliance with the Permit (R317-6-1.10).<br>2. Used to determine compliance with GWQS and/or Groundwater Protection Levels (GWPL) [R317-6-6.9A]. GWPLs are defined as a fraction of GWQS concentration, depending on local groundwater class, and are used to provide early warning of an impending release to groundwater (R317-6-4). Groundwater class is based on the background concentrations of total dissolved solids (TDS) in the aquifer, and is used to afford more protection to high quality, low TDS groundwater (R317-6-3).<br>3. Located after consideration of local hydrology, type of pollutants, and other factors (ibid.),<br>4. Located as close as practicable to the point of discharge in order to provide early warning of a release to groundwater (ibid.). Point of discharge is defined as the outermost perimeter of the discharge source, or for impoundments the outermost edge of the dikes (R317-6-1.28), and<br>5. Located on property owned by the facility (unless permission granted from affected nearby property owners [R317-6-6.9A]).<br><br>**Rule Comparability:** equivalent provisions are provided in the State regulations. |
| | *The Commission shall identify hazardous constituents, establish concentration limits, set the compliance period, and may adjust the point of compliance if needed to accord with developed data and site information as to the flow of ground water or contaminants, when the detection monitoring established under* | The Executive Secretary also identifies contaminants needed for monitoring during review of the initial Permit application, primarily through evaluation of the possible source term contaminants present on site (R317-6-6.3F). This information is integral to GWQP Rule mandate that requires the Permittee to submit a groundwater monitoring plan as a part of the Permit application. This plan must include a description and justification of the types and numbers of ground water quality parameters to be monitored [R317-6-6.3(I)(7)].<br><br>Concentration limits for the Permit are based on Ground Water Protection Levels (GWPL), which by definition are determined by groundwater class, and are fractions of the State GWQS. During issuance of a Permit, the Executive |

| NRC Citation | NRC Regulatory Language | Discussion of Equivalent Utah Statutory Authority and/or Rules |
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| | *Criterion 7A indicates leakage of hazardous constituents from the disposal area.* | Secretary can determine permit specific pollutants, on a case-by case basis, as Ad-hoc GWQS (R317-6-2.2).<br><br>As mentioned above, the compliance period begins when the Permit is issued, and continues until it is terminated by the Executive Secretary just prior to site transfer to the DOE general license, see discussion on "compliance period" definition, above.<br><br>The ability to adjust the number and location of groundwater monitoring wells or to adjust the number of groundwater quality monitoring parameters, to ensure adequate detection of groundwater contamination from the waste disposal site is made possible by the groundwater monitoring requirements in R317-6-6.9A. A re-evaluation and change in Permit requirements, if necessary, is usually accomplished every 5-years as a part of Permit renewal, as outlined in R317-6-6.6 and 6.7.<br><br>Editorial Note: With the intent of preventing groundwater pollution, the evaluation and adjustment of requirements upon Permit renewal does not require that pollution first adversely impact local groundwater quality before Permit monitoring changes are made. As for a detection monitoring program, historically some Permittees have successfully argued use of an initial short list of groundwater monitoring parameters that is expanded to a longer list of contaminants upon detection of any contaminant of concern. In common practice the Executive Secretary includes re-opening provisions in Permits to allow modification of the CMP locations, numbers of wells, and water quality parameters on an as-needed basis.<br><br>**Rule Comparability:** The State rule provides the same capability with regards to identifying the types and numbers of contaminants needed for groundwater monitoring, establishing necessary concentration limits (GWQS and GWPLs), and determining the location and number of CMPs. The State rules also offer an additional degree of protection in that these determinations are made a priori at the time of Permit issuance, and need not wait for groundwater pollution to be made manifest. |
| Criterion 5B(2) | *A constituent becomes a hazardous constituent subject to paragraph 5B(5) only when the constituent meets all three of the following tests:*<br><br>*(a) The constituent is reasonably expected to be in or derived from the byproduct material in the disposal area;*<br><br>*(b) The constituent has been detected in the ground water in the uppermost aquifer; and*<br><br>*(c) The constituent is listed in Criterion 13 of this appendix.* | The Permittee is required to submit an application that provides a detailed characterization of the potential contaminant source term [R317-6-6.3(F)]. Thereafter, the groundwater monitoring contaminants are identified by the Executive Secretary after careful examination of the characteristics of the effluents or wastes that may be discharged or potentially discharged from the facility (ibid.). The Executive Secretary then determines the groundwater monitoring parameters and sets appropriate concentration limits (GWQS and/or GWPLs) to protect public health and the environment [R317-6-6.9(A)]. These contaminants can include ad-hoc GWQS, mentioned above (R317-6-2.2).<br><br>Editorial Note: with an eye to preventing groundwater pollution the State rule does not have any pre-requisite that the contaminant must first pollute the water table aquifer before it is regulated by Permit. While Criterion 13 is extensive and can be used as a guide to determine groundwater monitoring parameters, no pre-determined list of contaminants is dictated by the GWQP Rules. The purpose of this approach is to allow the Executive Secretary flexibility in tailoring the Permit requirements, on a case-by-case basis, to the individual characteristics of each discharging or potentially discharging facility.<br><br>**Rule Comparability:** the State rule is equivalent in its requirements for source term characterization under Criterion 5B(2)(a). No predetermined list of contaminants is specified in the Utah GWQP Rules. However, the State approach provides that:<br>1) GWQS can be determined by the Executive Secretary a priori before a contaminant pollutes the water table |

| NRC Citation | NRC Regulatory Language | Discussion of Equivalent Utah Statutory Authority and/or Rules |
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| | | aquifer, and<br>2) Executive Secretary can use the Criterion 13 list as a guide in combination with site specific source characterization information provided by the Permit applicant to determine the type and number of GWQS and GWPLs necessary for a Permit or Corrective Action Plan. This State approach allows flexibility beyond the Criterion 13 list to determine site-specific GWQS on other pollutants known to be toxic or cause health or environmental harm, as established by other accepted regulatory, research, or governmental agencies. |
| Criterion 5B(3) | *Even when constituents meet all three tests in paragraph 5B(2) of this criterion, the Commission may exclude a detected constituent from the set of hazardous constituents on a site specific basis if it finds that the constituent is not capable of posing a substantial present or potential hazard to human health or the environment. In deciding whether to exclude constituents, the Commission will consider the following:*<br><br>*(a) Potential adverse effects on ground-water quality, considering --*<br>*(i) The physical and chemical characteristics of the waste in the licensed site, including its potential for migration;*<br>*(ii) The hydrogeological characteristics of the facility and surrounding land;*<br>*(iii) The quantity of ground water and the direction of ground-water flow;*<br>*(iv) The proximity and withdrawal rates of ground-water users;*<br>*(v) The current and future uses of ground water in the area;*<br>*(vi) The existing quality of ground water, including other sources of contamination and their cumulative impact on the ground-water quality;*<br>*(vii) The potential for health risks caused by human exposure to waste constituents;*<br>*(viii) The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents;*<br>*(ix) The persistence and permanence of the potential adverse effects.* | This type of evaluation is handled either during Permit issuance or thru the course of Executive Secretary approval of a groundwater Corrective Action Plan. As a part of a Permit application, the owner / operator is required to provide a complete description of these same data elements, including [R317-6-6.3(D) thru (G)]:<br><br>1. Water Source Description – including wells, well uses, topography, springs, water bodies, drainages, and man-made structures within 1-mile of the facility.<br>2. Hydrogeologic Description – including a description of soil types, aquifers, groundwater flow direction, groundwater quality, aquifer material, and well logs within a 1-mile radius of the facility.<br>3. Source Term Characterization – including the type, source, and physical / chemical radiological / and toxic characteristics of the effluent or potential effluent that may be discharged from the facility. This also includes average and maximum daily volumes wastewater / leachate to be discharged, and the anticipated contaminant concentrations in said discharges.<br>4. Source Control Justification – including a detailed description and justification that the source(s) or potential source(s) will be controlled and managed to protect receiving ground and surface water quality resources (including surface water standards, GWQS, groundwater class limits, and GWPLs).<br><br>During the Permit issuance process, the Executive Secretary may determine that certain groundwater contaminants at a facility are necessary for groundwater monitoring and may set concentration limits (GWQS and GWPLs) for those pollutants (R317-6-6.9(A) and R317-6-2.2). On the other hand, the Executive Secretary may determine that monitoring needs at a waste disposal site are best served by requiring that certain contaminants be sampled only for a groundwater monitoring purpose without establishment of a respective GWPL or GWQS for that contaminant(s). As in all cases of Permit issuance, the Executive Secretary is required to issue a public notice the draft Permit has been prepared for the facility, provide a 30-day minimum public comment period, and receive public comment on the action in question (R317-6-6.5).<br><br>A similar process is found in the State GWQP Rules after a contaminant reaches the water table aquifer at a facility. After determination that a groundwater contaminant has exceeded its GWQS (un-permitted facility), or a Permit limit (e.g., GWPL), the Executive Secretary may require the owner / operator to prepare and conduct both a Contaminant Investigation and a Corrective Action Plan [R317-6-6.15 (A) and (C)]. The purpose of the Contaminant Investigation Report (CIR) is to fully characterize the apparent pollution and its source, and local groundwater hydrogeologic conditions. The State GWQP Rules require a significant amount of detail must be included in the CIR, including [R317-6-6.15(D)(1)(a) thru (e)]:<br><br>1. Characterization of Pollution – including: amount, form, concentration, toxicity, environmental fate and transport, other significant characteristics of the groundwater pollution (including any contributing surface contamination), |

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| | *(b) Potential adverse effects on hydraulically-connected surface water quality, considering --*<br>*(i) The volume and physical and chemical characteristics of the waste in the licensed site;*<br>*(ii) The hydrogeological characteristics of the facility and surrounding land;*<br>*(iii) The quantity and quality of ground water, and the direction of ground-water flow;*<br>*(iv) The patterns of rainfall in the region;*<br>*(v) The proximity of the licensed site to surface waters;*<br>*(vi) The current and future uses of surface waters in the area and any water quality standards established for those surface waters;*<br>*(vii) The existing quality of surface water, including other sources of contamination and the cumulative impact on surface-water quality;*<br>*(viii) The potential for health risks caused by human exposure to waste constituents;*<br>*(ix) The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents; and*<br>*(x) The persistence and permanence of the potential adverse effects.* | vertical and horizontal extent of the contamination, and concentrations and distribution and chemical makeup of the contamination within the plume.<br>2. Characterization of the Facility – including: contaminant substances / mixtures present and media of occurrence, hydrogeologic conditions present at facility (including upgradient and downgradient conditions), surface waters present at the site, climate and meteorological conditions at the site, type / location / description of the possible sources of the pollution, and groundwater withdrawals and types of uses within a 2-mile radius.<br>3. Evaluation of CIR Data Gaps – including quality assurance / quality control measures used to collect the data, description of data used in the CIR, and description of data gaps encountered and plans to fill said data gaps.<br>4. Risk Assessment – including all studies necessary to justify the proposed groundwater contaminant cleanup concentration(s).<br>5. Any Other Information Required – by the Executive Secretary must also be included in the CIR. Among other uses, this provision allows the Executive Secretary to protect hydraulically connected surface water.<br><br>After submittal and approval of the CIR, the owner / operator is required to submit a Corrective Action Plan (CAP). The CAP must provide several different types of information, as follows [R317-6-6.15(D)(2) and 6.15(E)]:<br>1. Construction and Operation Description – for the proposed Corrective Action (CA) system,<br>2. Completion Schedule – for construction of the proposed CA system and cleanup of the effected groundwater,<br>3. Demonstration of Protection – that the proposed CA system will protect public health and the environment.<br>4. Demonstration that Approved Groundwater Concentration Limits Will Be Met – this includes approved GWQS [R317-6-6.15(F)(1)], ad-hoc GWQS established by the Executive Secretary for the cleanup [R317-6-6.15(F)(2)], or other alternate cleanup concentrations approved by the Executive Secretary [as per R317-6-6.15(G)].<br>5. Evaluation of Off-site Impacts – including, but not limited to contaminants released from the site by contaminated groundwater or the transport and disposition of the contaminated material at a secondary disposal site.<br>6. Demonstration of Permanent Effect – that the CA will produce a permanent effect in cleaning up the contaminated groundwater at the site.<br>7. Description of All Measures to be Used – used by the CA system, including, but not limited to: capping or other source control methods, long-term groundwater monitoring and reporting, long-term operation and maintenance of the CA system, environmental hazard notices and other security, periodic review to determine if the CA system continues to protect public health and the environment.<br>8. Any Other Information Required – by the Executive Secretary during review of the CAP. This provision allows the Executive Secretary to protect hydraulically connected surface waters, among other things.<br><br>Editorial Note: during review of the CIR and CAP, the Executive Secretary may omit a groundwater contaminant from any required groundwater monitoring or cleanup action, provided that said contaminant does not pose a risk to public health and the environment and meets all other State requirements, as listed above. Before approval of any CAP, the Executive Secretary must publish a public notice in a local newspaper and provide at least a 30-day public comment |

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| | | period [R317-6-6.15(E)].<br><br>**Rule Comparability:** minor differences exist in the State wording. However, the objectives of the Permit application needs and the CIR and CAP requirements for groundwater cleanup; plus the capability of the Executive Secretary to require the additional actions and data gathering all combine to provide an equivalent degree of protection of groundwater resources. |
| Criterion 5B(4) | *In making any determinations under paragraphs 5B(3) and 5B(6) of this criterion about the use of ground water in the area around the facility, the Commission will consider any identification of underground sources of drinking water and exempted aquifers made by the Environmental Protection Agency.* | A similar process of identifying groundwater suitable for human consumption, and therefore enhanced protection, is made by the Executive Secretary thru the State groundwater classification process. Under this process, groundwater is classified by its Total Dissolved Solids (TDS) content, among other parameters, as follows (see R317-6-3 and R317-6-4):<br><br>Class IA = Pristine Groundwater, where TDS < 500 mg/l (GWPLs here are determined on a 10% basis of GWQS),<br><br>Class 1B = Irreplaceable Groundwater for a public drinking water system (GWPLs here are also determined on 10% basis of the GWQS),<br><br>Class 1C = Ecologically Important Groundwater, necessary for the existence of wildlife (GWPLs here are based on pre-requisite surface water quality standards needed to support the wildlife).<br><br>Class II = Drinking Water quality groundwater where 500 mg/l < TDS < 3,000 mg/l, and no groundwater contaminant exceeds its GWQS (GWPLs here are determined on a 25% basis of the GWQS)<br><br>Class III = Limited Use Groundwater, where 3,000 mg/l < TDS < 10,000 mg/l <u>or</u> one or more contaminants exceed their respective GWQS (GWPLs here are determined on a 50% basis of the GWQS.) This groundwater class is roughly equivalent to an "exempted aquifer" under the EPA Safe Drinking Water Act / Underground Injection Control Regulations found in 40 CFR 146.4).<br><br>Class IV = Saline Groundwater, where TDS > 10,000 mg/l (GWPLs here are determined on a case-by-case basis by the Executive Secretary. In practice, the Executive Secretary has assigned GWPLs at facilities overlying Class IV groundwater in order to ensure that sufficient engineering controls are provided to adequately contain and sequester 11e.(2) waste contaminants).<br><br>Under State rule, the Board may initiate the groundwater classification process during the Permit issuance process. Either a community or an individual person may petition the Board to classify nearby aquifers or parts of aquifers with the intent of protecting local groundwater quality (R317-6-5).<br><br>**Rule Comparability:** the State rules provide steps to identify underground sources of drinking water thru the groundwater classification process. This process is a major underpinning to the State Permit issuance and groundwater corrective action programs. The State groundwater classification system provides protection for some limited groundwater resources that could be considered "exempted" from protection under EPA rules. |
| Criterion 5B(5) | *At the point of compliance, the concentration of a hazardous constituent must not exceed --* | The State process for determining compliance at the compliance monitoring point has several points in common. Compliance exists when groundwater quality meets one of the following Permit limits [R317-6-6.16(A) and (B)]: |

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| | *(a) The Commission approved background concentration of that constituent in the ground water;*<br><br>*(b) The respective value given in the table in paragraph 5C if the constituent is listed in the table and if the background level of the constituent is below the value listed; or*<br><br>*(c) An alternate concentration limit established by the Commission* | 1. GWPLs – where groundwater monitoring results are equal to or below the GWPL concentrations assigned in the Permit. As described above, the GWPLs are fractions of the GWQS, are determined largely by groundwater class, and are used to provide early warning of a discharge to groundwater. When a GWPL is exceeded, the Permittee is required to implement more frequent groundwater sampling to confirm the apparent exceedance.<br><br>2. Alternate Concentration Limits (ACL) – where the Board has approved ACLs in issuance of a Permit, pursuant to R317-6-6.4(B) or (D),the Permittee is required to maintain local groundwater quality below the corresponding ACL limits [R317-6-6.4(E)].<br>Further, background groundwater quality concentrations for contaminants of concern are taken in to account in these compliance determinations at one or more of the following decision points:<br><br>1. Initial Determination of Groundwater Class – if natural background at a waste disposal site contains contaminants at a concentration in excess of the GWQS, then that groundwater is categorized Class III. In this case, less protection of the aquifer is afforded and higher GWPL values assigned in the Permit (R317-6-4.6). Details on how background groundwater quality data are to be collected and the background determined are found in R317-6-6.10.<br><br>2. Class IV Groundwater – in those cases where background groundwater TDS is greater than 10,000 mg/l, the Executive Secretary classifies the groundwater Class IV and determine GWPLs, on a Permit specific basis, to protect human health and the environment (R317-6-4.7). Historically in these cases, the GWPL concentrations were assigned equal to the corresponding GWQS.<br><br>3. Out of Compliance Status – a facility is not deemed to be out-of-compliance with its Permit limits (GWPLs or ACLs) until after 2 consecutive groundwater samples exceed [R317-6-6.16(B)]:<br>a) The assigned Permit limit (GWPL or ACL), and<br>b) The background contaminant concentration, as determined by the mean plus 2-standard deviation concentration, or<br>c) The groundwater concentration found is statistically significantly higher than the applicable Permit limit, as determined by EPA RCRA statistical methods.<br><br>**Rule Comparability:** Although the State / NRC mechanics differ somewhat, the overall objective in the State rules is equivalent. |
| Criterion 5B(6) | *Conceptually, background concentrations pose no incremental hazards and the drinking water limits in paragraph 5C state acceptable hazards but these two options may not be practically achievable at a specific site. Alternate concentration limits that present no significant hazard may be proposed by licensees for Commission consideration. Licensees must provide the basis for any proposed limits including consideration of practicable corrective actions, that limits are as low as reasonably achievable, and* | In a similar vein, the State also assumes that Class I and II groundwater poses no risk to human consumption, in that these groundwaters are deemed drinking water quality (R317-6-3.1 thru 3.5).<br><br>For new facilities that overlie Class III groundwater (EPA "exempted' aquifers), the Board may approve an ACL request if the Permittee is able to show the extent which the release will exceed the TDS class limit, the appropriate GWQS, and the applicable GWPLs for all contaminants of concern and demonstrates that [R317-6-6.4(B)]:<br><br>1. The facility incorporates Best Available Technology (BAT) in its control of the discharge,<br><br>2. The pollution poses no risk to human health and the environment, and<br><br>3. The ACL is justified based on other considerations such as substantial over-riding social and economic benefits.<br><br>For existing facilities, i.e., those that pre-dated the State GWQP Rules (adopted in 1989) and notified the Executive |

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| | *information on the factors the Commission must consider. The Commission will establish a site specific alternate concentration limit for a hazardous constituent as provided in paragraph 5B(5) of this criterion if it finds that the proposed limit is as low as reasonably achievable, after considering practicable corrective actions, and that the constituent will not pose a substantial present or potential hazard to human health or the environment as long as the alternate concentration limit is not exceeded. In making the present and potential hazard finding, the Commission will consider the following factors:*<br><br>*(a) Potential adverse effects on ground-water quality, considering --*<br>*(i) The physical and chemical characteristics of the waste in the licensed site including its potential for migration;*<br>*(ii) The hydrogeological characteristics of the facility and surrounding land;*<br>*(iii) The quantity of ground water and the direction of ground-water flow;*<br>*(iv) The proximity and withdrawal rates of ground-water users;*<br>*(v) The current and future uses of ground water in the area;*<br>*(vi) The existing quality of ground water, including other sources of contamination and their cumulative impact on the ground-water quality;*<br>*(vii) The potential for health risks caused by human exposure to waste constituents;*<br>*(viii) The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents;*<br>*(ix) The persistence and permanence of the potential adverse effects.* | Secretary of their existence before February 10, 1990, ACLs may be approved by the Board if the Permittee shows the extent the discharge exceeds applicable TDS class limits, GWQS and applicable GWPLs for the contaminants of concern, and demonstrates that [R317-6-6.4(D)]:<br>1. Steps are being taken to control the source of the pollution, including a defined program of action and schedule,<br>2. The pollution poses no risk to human health and the environment, and<br>3. The ACL is justified based on other considerations such as substantial over-riding social and economic benefits.<br><br>With regards to the detailed factors that the Commission must consider when making a decision on a proposed ACL, particularly those dealing with potential adverse effects on groundwater quality [Criterion 5B(6)(a)] and surface water quality [Criterion 5B(6)(b)], the NRC regulatory language in Criterion 5B(6) is identical to that found in Criterion 5B(3), above. For an evaluation of the comparability of these detailed factors with the applicable State rules, the reader is referenced to the Criterion 5B(3) section above.<br><br>Editorial Note: all technical information provided by the Permittee in support of an ACL application is normally revisited and re-evaluated by the Executive Secretary at the time of Permit renewal; which is based on a 5-year life cycle [R317-6-6.7].<br><br>**Rule Comparability:** equivalent requirements are found in the State rules, in that the owner / operator is required to demonstrate that practicable corrective actions have been applied and the ACL poses no risk to human health or the environment. The detailed technical factors that must be considered under the NRC requirements are also adequately addressed by the State rules. |

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| | *(b) Potential adverse effects on hydraulically-connected surface water quality, considering --*<br>*(i) The volume and physical and chemical characteristics of the waste in the licensed site;*<br>*(ii) The hydrogeological characteristics of the facility and surrounding land;*<br>*(iii) The quantity and quality of ground water, and the direction of ground-water flow;*<br>*(iv) The patterns of rainfall in the region;*<br>*(v) The proximity of the licensed site to surface waters;*<br>*(vi) The current and future uses of surface waters in the area and any water quality standards established for those surface waters;*<br>*(vii) The existing quality of surface water including other sources of contamination and the cumulative impact on surface water quality;*<br>*(viii) The potential for health risks caused by human exposure to waste constituents;*<br>*(ix) The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents; and*<br>*(x) The persistence and permanence of the potential adverse effects.* | |
| Criterion 5C | Table 5C contains the NRC maximum concentration values for groundwater protection (GWP Values), see Attachment 1, below | Comparison of NRC GWP concentration values and the State GWQS is found in Attachment 1, below.<br><br><u>Editorial Note</u>: In 1987 the NRC adopted EPA drinking water maximum concentration limits (MCLs) as Ground Water Protection Standards (GWPS) in 10 CFR 40 Appendix A, Table 5C. Likewise, in 1989 when the Utah GWQP Rules were promulgated, the State's GWQS were equal to these same EPA MCLs (R317-6-2, Table 1), see Attachment 1, below. However, since 1989 the U.S. EPA has revised its drinking water MCLs with new concentrations that took effect largely in 1992. In order to ensure protection of groundwater quality and public health in Utah, the State followed suit and adopted the revised EPA MCL values as GWQS. Unfortunately, these changes in drinking water MCLs have not been revised by EPA in its groundwater protection standards for uranium mills found in 40 CFR 192. This is the principal reason why differences exist between the NRC GWPS and the Utah GWQS.<br><br>**Rule Comparability:** the differences seen in the concentration limits adopted for groundwater protection under the State rules (GWQS) are due to the fact the State has stayed abreast of the EPA changes to drinking water MCL values. |

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| Criterion 5D | *If the ground-water protection standards established under paragraph 5B(1) of this criterion are exceeded at a licensed site, a corrective action program must be put into operation as soon as is practicable, and in no event later than eighteen (18) months after the Commission finds that the standards have been exceeded. The licensee shall submit the proposed corrective action program and supporting rationale for Commission approval prior to putting the program into operation, unless otherwise agreed to by the Commission. The objective of the program is to return hazardous constituent concentration levels in ground water to the concentration levels set as standards. The licensee's proposed program must address removing hazardous constituents that have entered the ground water at the point of compliance or treating them in place. The program must also address removing or treating any hazardous constituents that exceed concentration limits in ground water between the point of compliance and the downgradient facility property boundary. The licensee shall continue corrective action measures to the extent necessary to achieve and maintain compliance with the groundwater standard. The Commission will determine when the licensee may terminate corrective action measures based on data from the ground-water monitoring program and other information that provide reasonable assurance that the ground-water protection standard will not be exceeded.* | Similar objectives are found in the State regulations. Upon an exceedance of a GWPL established by Permit, the Permittee is required to implement an accelerated groundwater sampling program in order to confirm the exceedance [R317-6-6.16(A)]. Out-of-compliance status does not exist until after at least 2 or more consecutive groundwater samples exceed either [R317-6-6.16(B)]:<br>1. The assigned Permit limit (GWPL or ACL), <u>and</u><br>2. The background contaminant concentration, as determined by the mean plus 2-standard deviation concentration, <u>or</u><br>3. The groundwater concentration found is statistically significantly higher than the applicable Permit limit, as determined by EPA RCRA statistical methods.<br><br>Generally this determination takes between 2 to 6-months, depending on the sampling frequency established in the Permit for this purpose. Upon confirmation that the out-of-compliance status exists, the Permittee is required to notify the Executive Secretary of the release within 24-hours (verbal) and 5-days (written) [R317-6-6.15(B)]. At this point, a 2-step process begins, as outlined below:<br>1. <u>Contaminant Investigation Report</u> - the Executive Secretary requires the Permittee to submit a Contaminant Investigation (CI) Report for review and approval [R317-6-6.15(C)]. Within 30-days of receipt of this notice, the Permittee is required to submit a schedule for completion of the contaminant investigation and submittal of the required report (ibid.). This proposed schedule may be accepted, rejected, and or modified by the Executive Secretary (ibid.). The technical content required of the CI Report is comprehensive and outlined in R317-6-6.15(D)(1). Studies are required to characterize both the groundwater pollution and the apparent pollution source(s). During review of the CI Report the Executive Secretary may request additional information on an as needed basis.<br><br>2. <u>Groundwater Corrective Action Plan</u> – in the next step the Permittee is required to submit a Groundwater Corrective Action (CA) Plan, for Executive Secretary approval, that includes both a schedule for completion of the action and description of the construction and operation of the corrective action program [R317-6-6.15(D)(2)]. Several technical requirements must be met by the proposed corrective action, including [R317-6-6.15(E)]:<br>a. <u>Completeness and Accuracy</u> – both the CA Plan and the CI Report must be complete and accurate.<br>b. <u>Protective</u> – the corrective action must be protective of public health and the environment. To be protective, the Executive Secretary must consider potential impacts to groundwater quality at locations outside and beyond the Permitted facility boundaries.<br>c. <u>Approved Concentration Limits</u> – the corrective action must meet the groundwater concentration limits approved by the Executive Secretary, or Alternate Corrective Action Concentration Limits approved by the Board.<br>d. <u>Permanent Effect</u> – the corrective action must produce a permanent effect. Source controls imposed must not cause pollution to other unaffected areas within the facility boundaries.<br><br>3. <u>Groundwater Corrective Action Concentration Limits</u> – significant effort is put into determination of the contaminants that must be controlled and mitigated by the corrective action and the appropriate concentration limit for each. In general, the corrective action must either return the groundwater quality to the State GWQS or to an approved alternative concentration limit [R317-6-6.15(F)]. For contaminants where no GWQS is established in the State rule, the Executive Secretary is allowed to establish site specific, ad-hoc GWQS that are protective of human health and the environment [ibid., and R317-6-6.15(F)(2)].<br>4. <u>Alternative Groundwater Corrective Action Concentration Limits</u> – a CA Plan may propose an Alternate |

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| | | Corrective Action Concentration Limit (ACACL) [R317-6-6.15(G)]. However, only the Board may approve a proposed ACACL. Proposed concentrations for an ACACL may be either higher or lower than the corresponding GWQS, as outlined below:<br>a. Higher ACACLs – the Board may approve a higher ACACL concentration provided that the Permittee is able to demonstrate the proposed concentration and corrective action program is:<br>i. Protective of human health and the environment<br>ii. Incorporates Best Available Technology (BAT), as defined in R317-6-1.3, and<br>iii. Both conservative and technologically achievable.<br>b. Lower ACACLs – a third party may request the Board apply a lower ACACL to a CA Plan. However, such a request requires submittal and Board consideration of:<br>i. Relevant cleanup or health standards, criteria or guidance,<br>ii. Relevant scientific information,<br>iii. Information relevant to protectiveness,<br>iv. Impact of additional proposed measures.<br>c. Additional Considerations – irrespective if the proposed ACACL is higher or lower, the Board must also consider:<br>i. Good Cause – which includes capitol, operation, and maintenance costs, costs of periodic reviews, potential future remedial action costs, and loss of resource value, and<br>ii. Background and Existing Groundwater Concentrations – in its deliberations the Board may consider background concentrations at the facility. However, under no circumstances can an ACACL be greater than the existing concentrations at the facility, or the concentrations projected to result from the existing pollution conditions.<br><br>In the process of reviewing the CI Report and CA Plan, the Executive Secretary is required to consider many issues including:<br>1. The need for long-term operation of the corrective action program and long-term groundwater monitoring in order to demonstrate that the GWQS or ACACL concentrations have been met [R317-6-6.15(E)(5)(a) and (d)], and<br>2. The need for periodic review of the groundwater quality data at the facility to determine if the correction action protects human health and the environment [R317-6-6.15(E)(5)(e)].<br><br>Upon acceptance of the CI Report and CA Plan, the Executive Secretary is required to provide a public notice, and a 30-day public comment period. Thereafter, the Executive Secretary is required to issue an order to Permittee approving, disapproving, or modifying the CA Plan [R317-6-6.15(E)].<br><br>**Rule Comparability:** the State rules are equivalent in purpose and objective to the NRC Criterion 5D requirements. While the State process does not include an 18-month deadline for the owner /operator to implement a groundwater corrective action program; a similar time period normally transpires during submittal of the contaminant investigation report and groundwater corrective action plan. If necessary, an enforcement order ensures any obligations that need to be met are accomplished. |
| Criterion 5E | *In developing and conducting ground-water protection programs, applicants and licensees shall also consider the following:* | The State requirements in this regard are very similar. During issuance of a Permit, the Executive Secretary must make a finding that the Permittee has applied BAT to the new waste disposal facility [R317-6-6.4(A)(3)]. Currently, it is the Executive Secretary's practice for Class I, II, and III groundwater to require BAT to include an engineering design that incorporates a double Flexible Membrane Liner (FML) and a leak detection system (LDS). This LDS in turn becomes |

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| | *(1) Installation of bottom liners (Where synthetic liners are used, a leakage detection system must be installed immediately below the liner to ensure major failures are detected if they occur. This is in addition to the ground-water monitoring program conducted as provided in Criterion 7. Where clay liners are proposed or relatively thin, in-situ clay soils are to be relied upon for seepage control, tests must be conducted with representative tailings solutions and clay materials to confirm that no significant deterioration of permeability or stability properties will occur with continuous exposure of clay to tailings solutions. Tests must be run for a sufficient period of time to reveal any effects if they are going to occur (in some cases deterioration has been observed to occur rather rapidly after about nine months of exposure)).*<br>*(2) Mill process designs which provide the maximum practicable recycle of solutions and conservation of water to reduce the net input of liquid to the tailings impoundment.*<br>*(3) Dewatering of tailings by process devices and/or in-situ drainage systems (At new sites, tailings must be dewatered by a drainage system installed at the bottom of the impoundment to lower the phreatic surface and reduce the driving head of seepage, unless tests show tailings are not amenable to such a system. Where in-situ dewatering is to be conducted, the impoundment bottom must be graded to assure that the drains are at a low point. The drains must be protected by suitable filter materials to assure that drains remain free running. The drainage system must also be adequately sized to assure good drainage)* | the primary compliance monitoring point for the facility, and the Permit issued with appropriate performance monitoring requirements for operation and maintenance of the LDS [R317-6-6.9(B)]. In these situations, groundwater monitoring wells then become secondary compliance monitoring points in a Permit [R317-6-6.9(A)].<br><br>With regard to clay liners that might be used at a disposal site, State rules found in R317-6-6.3(F) require, among other things, that the applicant thoroughly characterize the physical properties of the waste and leachate to be controlled. State requirements set out in R317-6-6.3(G) mandate that the Permittee provide "*...Information which shows that the discharge can be controlled and will not migrate into or adversely affect the quality of any other waters of the state, ...*" This includes geochemical and engineering stability of the earthen materials with the anticipated waste and / or leachates.<br><br>As for three (3) remaining NRC considerations, mill process designs that maximize wastewater recycling, tailings de-watering, and neutralization of tailings; all are consistent with the State definition of BAT which includes *"...the application of design, equipment, work practice, operation standard or combination thereof at a facility to effect the maximum reduction of a pollutant achievable by available processes and methods ..."* (R317-6-1.3)<br><br>Editorial Note: for facilities where disposal cell or other related construction occurs over a multi-year timeframe, or where construction is delayed for an extended period, it is possible that new or emerging environmental and engineering technology could be available. Under these circumstances, the State definition of BAT could change during the non-construction period. In such situations, the Executive Secretary would:<br>1. Inform the Permittee that the Construction Permit has expired. Pursuant to State rules, a Construction Permit expires within 1-year of the issuance date should the approved facility not be under "substantial construction" [see R317-3-1.1(E)(3)(b)]. This action terminates any former approval for the Permittee to construct, operate, or modify the disposal cell or other "treatment works".<br>2. Amend the Groundwater Quality Discharge Permit to incorporate the new BAT definition and related requirements for facilities that have yet to be constructed. This change would normally be made at the time of Permit renewal, which is based on a 5-year life cycle [R317-6-6.6]. However, at the Permittee's request this Permit change could be made at an earlier date as a major modification of the Permit, following public notice and comment. At issuance of the modified or renewed Permit, the Executive Secretary is required to make a finding before the public that adequate BAT has been applied to the facility not yet constructed [R317-6-6.4(A)(3)].<br>In this manner, the Executive Secretary ensures that current BAT engineering design, construction, operation, and maintenance have been applied to the permitted facility for the protection of local groundwater resources.<br><br>**Rule Comparability:** the State rules and practice in determining if a discharge facility has incorporated BAT at its facility are consistent with and equivalent to all the groundwater protection program considerations in NRC Criterion 5E. |

| NRC Citation | NRC Regulatory Language | Discussion of Equivalent Utah Statutory Authority and/or Rules |
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| | *(4) Neutralization to promote immobilization of hazardous constituents.* | |
| Criterion 5F | *Where ground-water impacts are occurring at an existing site due to seepage, action must be taken to alleviate conditions that lead to excessive seepage impacts and restore ground-water quality. The specific seepage control and ground-water protection method, or combination of methods, to be used must be worked out on a site-specific basis. Technical specifications must be prepared to control installation of seepage control systems. A quality assurance, testing, and inspection program, which includes supervision by a qualified engineer or scientist, must be established to assure the specifications are met.* | Similar requirements are found in the State rules. In the process of issuing a Permit for an existing facility, one that pre-dated the GWQP rules, the Executive Secretary must determine that the GWQS and GWPLs will be met at some time in the future [R317-6-6.4(C)]. Among other mitigation measures, this demonstration would include adequate engineering design, construction, operation and maintenance of seepage control systems at a tailings impoundment or other treatment works. The Executive Secretary can require such technical information be provided as a part of a Permit application pursuant to R317-6-6.3(Q). Agency practice has been to also require submittal of construction quality assurance / quality control (CQA/QC) plans as a part of a Permit application. Once approved by the Executive Secretary, these plans become enforceable attachments to the Permit. Again, State rules allow such plans to be required and implemented during construction of a waste / wastewater disposal system (ibid.).<br><br>For existing facilities that have already caused groundwater pollution, the State rules require the Permit application include a corrective action plan or other measures to remedy the groundwater quality problem [R317-6-6.3(P)]. Again, agency practice has been to require development and implementation of CQA/QC Plans in order to ensure the efficacy of the corrective action, which is authorized under R317-6-6.3(Q).<br><br>**Rule Comparability**: the State rules and agency practice are equivalent to this NRC requirement. |
| Criterion 5G | *In support of a tailings disposal system proposal, the applicant/operator shall supply information concerning the following:*<br>*(1) The chemical and radioactive characteristics of the waste solutions.*<br>*(2) The characteristics of the underlying soil and geologic formations particularly as they will control transport of contaminants and solutions. This includes detailed information concerning extent, thickness, uniformity, shape, and orientation of underlying strata. Hydraulic gradients and conductivities of the various formations must be determined. This information must be gathered from borings and field survey methods taken within the proposed impoundment area and in surrounding areas where contaminants might migrate to ground water. The information gathered on boreholes must include both geologic and geophysical logs in sufficient number and degree of* | State rules also require detailed characterization of the tailings waste and wastewater as a part of the Permit application process [R317-6-6.3(F)].<br><br>As for subsurface characterization, the State rules mandate that a Permit application include a detailed characterization of:<br>1. Local geology and groundwater hydrology within a 1-mile radius of the tailings facility [R317-6-6.3(D and E)], and<br><br>2. Detailed site-specific characterization of hydrogeologic conditions, including, but not limited to: depth to groundwater, background groundwater quality, saturated thickness, groundwater flow direction(s), porosity, aquifer permeability, and flow system characteristics [R317-6-6.3(K)].<br><br>Further, the Executive Secretary has the ability to require additional information from the Permittee as needed in the application process [R317-6-6.3(Q)]. Historically, State Permits for 11e.(2) facilities in Utah have been required to provide the following information, including:<br><br>1. On-Site Geologic and Hydrogeologic Data – from borings, boreholes, and wells installed in the immediate vicinity of the proposed disposal areas. Such information includes, but is not limited to: depth to groundwater; hydraulic gradients; groundwater flow directions; aquifer permeability and spatial distribution thereof; geologic formation thickness, orientation, and extent; and aquifer mineral content; etc.<br><br>2. Field Aquifer Permeability - laboratory test results have been excluded in favor of field permeability test methods, e.g. slug and pump tests. |

| NRC Citation | NRC Regulatory Language | Discussion of Equivalent Utah Statutory Authority and/or Rules |
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| | *sophistication to allow determining significant discontinuities, fractures, and channeled deposits of high hydraulic conductivity. If field survey methods are used, they should be in addition to and calibrated with borehole logging. Hydrologic parameters such as permeability may not be determined on the basis of laboratory analysis of samples alone; a sufficient amount of field testing (e.g., pump tests) must be conducted to assure actual field properties are adequately understood. Testing must be conducted to allow estimating chemi-sorption attenuation properties of underlying soil and rock. (3) Location, extent, quality, capacity and current uses of any ground water at and near the site.* | 3. Soil-Water Partitioning Coefficients – geochemical testing of site specific soil materials has already been required to justify 11e.(2) tailings cell design<br><br>Regarding the extent, quality, capacity and current uses of groundwater, these same information needs are required by the State rules for a Permit application, pursuant to R317-6-6.3(D), (E), and (K)<br><br>**Rule Comparability:** the State rules and agency practice are equivalent to the NRC requirements for Criterion 5G. |
| Criterion 5H | *Steps must be taken during stockpiling of ore to minimize penetration of radionuclides into underlying soils; suitable methods include lining and/or compaction of ore storage areas.* | Ore stockpiles are an essential component of milling operations, and are regulated as potential sources of groundwater contamination under the State rules [R317-6-6.1(A) and (B)]. For a new disposal facility, the Permittee must demonstrate that BAT has been applied to the project [R317-6-6.4(A)(3)]. In turn, the State definition of BAT includes the application of engineering design and operation standards to maximize the reduction of pollutants discharged (R317-6-1.3). The design and construction of liners beneath an ore storage pad could meet this requirement. For existing facilities other means may be necessary to minimize the discharge of pollutants from an ore storage pad.<br><br>**Rule Comparability:** The State rules are equivalent to this NRC requirement. |
| Criterion 7A | *The licensee shall establish a detection monitoring program needed for the Commission to set the site specific ground-water protection standards in paragraph 5B(1) of this appendix. For all monitoring under this paragraph the licensee or applicant will propose for Commission approval as license conditions which constituents are to be monitored on a site specific basis. A detection monitoring program has two purposes. The initial purpose of the program is to detect leakage of hazardous constituents from the disposal area so that the need to set ground-water protection standards is monitored. If* | The existing State Permit process establishes GWQS for all related contaminants at time of Permit issuance [R317-6-2 and 2.2, and R317-6-6.4(A)(1) and (C)(1)]. In the event that new GWQS are adopted by the Board, the Permit may be reopened and new monitoring requirements, GWQS, and GWPLs required of the Permittee [R317-6-6.6(B)].<br><br>Similar to the NRC requirements and as explained above, some State Permits have been issued with a 2-tiered approach to groundwater monitoring, including a limited list of initial parameters used for detection monitoring. Later, upon detection this short list can be expanded, at the discretion of the Executive Secretary, to include more contaminants, should the initial parameters be detected [R317-6-6.9(A)].<br><br>Although the Permit applicant may propose groundwater monitoring parameters [R317-6-6.3(I)], the final determination of the number and type of contaminants that will be sampled by the Permittee is made by the Executive Secretary at the time of Permit issuance [R317-6-6.9(A)].<br><br>Any adjustment needed in the number and location of groundwater monitoring wells or in the number of groundwater quality monitoring parameters required by the Permit in order to maximize early detection of groundwater contamination from a waste disposal site is possible pursuant to R317-6-6.9A A re-evaluation of the groundwater |

| NRC Citation | NRC Regulatory Language | Discussion of Equivalent Utah Statutory Authority and/or Rules |
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| | *leakage is detected, the second purpose of the program is to generate data and information needed for the Commission to establish the standards under Criterion 5B. The data and information must provide a sufficient basis to identify those hazardous constituents which require concentration limit standards and to enable the Commission to set the limits for those constituents and the compliance period. They may also need to provide the basis for adjustments to the point of compliance.* | monitoring system and any change needed in Permit requirements is usually accomplished every 5-years as a part of Permit renewal (R317-6-6.6 and 6.7).<br><br>**Rule Comparability:** the State rules and practice allow the establishment of a groundwater detection monitoring program that is equivalent to the NRC requirement. |
| | *For licenses in effect September 30, 1983, the detection monitoring programs must have been in place by October 1, 1984. For licenses issued after September 30, 1983, the detection monitoring programs must be in place when specified by the Commission in orders or license conditions.* | All State Permits have an approved groundwater monitoring program in place at the time of Permit issuance [R317-6-6.4(A)(2), R317-6-6.4(C)(2), and R317-6-6.9].<br><br>**Rule Comparability:** the State rule is equivalent to this NRC requirement. |
| | *Once ground-water protection standards have been established pursuant to paragraph 5B(1), the licensee shall establish and implement a compliance monitoring program. The purpose of the compliance monitoring program is to determine that the hazardous constituent concentrations in ground water continue to comply with the standards set by the Commission.* | Under the State process, GWQS and GWPLs are determined for the facility at the time of Permit issuance [R317-6-2 and 2.2, and R317-6-6.4(A)(1) and (C)(1)]. Compliance with the GWPL ensures compliance with the GWQS, in that the GWPLs are set at lower concentrations, as determined by local groundwater class. This approach provides extra protection for high quality groundwater or sensitive wildlife habitats dependent on groundwater. The State GWPL approach also provides early warning of a release and additional time to identify the cause and full extent of the problem and craft a corrective action program to solve it before it travels off-site.<br><br>**Rule Comparability:** the State rule is more protective of the groundwater resource, in that the GWPL concept provides early warning of a release before exceedance of the applicable GWQS. |
| | *In conjunction with a corrective action program, the licensee shall establish and implement a corrective action monitoring program. The purpose of the corrective action monitoring program is to demonstrate the effectiveness of the corrective actions. Any monitoring program required by this paragraph may be based on existing monitoring programs to the extent the existing programs can meet the stated objective for the program.* | The State rules require that long-term groundwater and other monitoring is an essential element of the CA Plan approved by the Executive Secretary [R317-6-6.15(E) and (E)(5)(a)]. These long-term monitoring requirements can be added to a facility's Permit, pursuant to R317-6-6.4(G). Thereafter, determination that a facility continues to comply with the requirements of the CA Plan is made thru groundwater monitoring requirements in the Permit [R317-6-6.4(A)(2) and (C)(2)].<br><br>**Rule Comparability:** the State rules in question are equivalent to this NRC requirement. |

| NRC Citation | NRC Regulatory Language | Discussion of Equivalent Utah Statutory Authority and/or Rules |
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| Criterion 13 | *Secondary ground-water protection standards required by Criterion 5 of this appendix are concentration limits for individual hazardous constituents. The following list of constituents identifies the constituents for which standards must be set and complied with if the specific constituent is reasonably expected to be in or derived from the byproduct material and has been detected in ground water. For purposes of this appendix, the property of gross alpha activity will be treated as if it is a hazardous constituent. Thus, when setting standards under paragraph 5B(5) of Criterion 5, the Commission will also set a limit for gross alpha activity. The Commission does not consider the following list imposed by 40 CFR Part 192 to be exhaustive and may determine other constituents to be hazardous on a case-by-case basis, independent of those specified by the U.S. Environmental Protection Agency in Part 192.* | All of the NRC Criterion 13 hazardous constituents, and more, can be incorporated into the monitoring and compliance requirements in a State Permit, at the discretion of the Executive Secretary [R317-6-6.9(A), and R317-6-6.4(A)(2) and (C)(2)].<br><br>The flexibility provided by the State rule has allowed the Executive Secretary to regulate several contaminants at 11e.(2) waste disposal sites that have significant human health and / or environmental impacts, and are not currently listed in Criterion 13. Examples of several contaminants that exist leachates or groundwater at one or more 11e.(2) waste sites in Utah include, but are not limited to: ammonia, fluoride, manganese, nitrate, and nitrite. Although not classified as hazardous constituents under the EPA RCRA program, these groundwater contaminants have potential adverse health and environmental effects that deserve attention and control.<br><br>Close review of the NRC Criterion 13 parameters with the current EPA RCRA list of Hazardous Constituents (40 CFR 261, Appendix VIII), has also shown that the current Criterion 13 list of contaminants is less than complete, as summarized in the findings below. Details of this review are also found in Attachment 2, below. |
| | *Hazardous Constituents*<br><br><<< See Attachment 2 below for listing of the 380 NRC Criterion 13 contaminants >>> | Findings: the State rules allow the Executive Secretary flexibility in determination of the type and number of groundwater monitoring parameters needed in a Permit for an 11e.(2) facility, see discussion on NRC Criterion 5(B)(2), above. In this process, the Executive Secretary may use the NRC Criterion 13 list of contaminants as a guide, in conjunction with site specific source term characterization efforts, to determine appropriate groundwater monitoring parameters, GWQS and GWPLs in a Permit.<br><br>However, it important to note that at the time of promulgation of the NRC uranium mill rules in 1987 the 380 Criterion 13 contaminants were adopted verbatim from the EPA RCRA list of Hazardous Constituents found in 40 CFR 261, Appendix VIII. Since 1987, the EPA has amended Appendix VIII list 13 times, as outlined below:<br>53 FR 13388, Apr. 22, 1988 — 53 FR 43881, Oct. 31, 1988 — 54 FR 50978, Dec. 11, 1989<br>55 FR 50483, Dec. 6, 1990 — 56 FR 7568, Feb. 25, 1991 — 59 FR 468, Jan. 4, 1994<br>59 FR 31551, June 20, 1994 — 60 FR 7853, Feb. 9, 1995 — 60 FR 19165, Apr. 17, 1995<br>62 FR 32977, June 17, 1997 — 63 FR 24625, May 4, 1998 — 65 FR 14475, Mar. 17, 2000, and<br>65 FR 67127, Nov. 8, 2000.<br><br>DRC comparison of the NRC Criterion 13 contaminants with the current EPA RCRA Appendix VIII list, promulgated on November 8, 2000, shows many differences exist in the number of contaminants listed, as follows:<br>1. 8 NRC Contaminants Eliminated – eight (8) NRC Criterion 13 contaminants have been dropped from the current EPA RCRA Hazardous Constituent list, including: |

| NRC Citation | NRC Regulatory Language | Discussion of Equivalent Utah Statutory Authority and/or Rules |
|---|---|---|
| | | 2-sec-Butyl-4,6-dinitrophenol (DNBP) / Iron dextran<br>Molybdenum* and compounds, N.O.S. / 4-Nitroquinoline-1-oxide<br>Radium -226 and –228 / Strontium sulfide<br>Thorium and compounds, N.O.S.,3 (when producing thorium byproduct material) / Uranium* and compounds, N.O.S.3.<br>* Uranium and molybdenum have been effectively added back to the Criterion 13 list pursuant to existing EPA rules in 40 CFR 192.32(a)(2)(i).<br><br>2. <u>84 New Contaminants Added</u> – EPA has added 84 new contaminants to its Appendix VIII RCRA Hazardous Constituent list that are not currently found in NRC Criterion 13, including:<br>A2213 / Aldicarb sulfone<br>Allyl Chloride / Barban<br>Bendiocarb / Bendocarb phenol<br>Benomyl / Benzo(k)fluoranthene<br>Beryllium powder / Bis(pentamethylene)-thiuram tetrasulfide<br>Butylate / Carbaryl<br>Carbendazim / Carbofuran<br>Carbofuran phenol / Carbosulfan<br>Chloroprene / Copper dimethyldithiocarbamate<br>m-Cumenyl methylcarbamate / Cycloate<br>Dazomet / Diethylene glycol, dicarbamate<br>Dimetilan / Dinoseb<br>Disulfiram / EPTC<br>Ethyl Ziram / Ethylene glycol monoethyl ether<br>Ferbam / Formetanate hydrochloride<br>Formparanate / Heptachlorodibenzofurans<br>Heptachlorodibenzo-p-dioxins / Hexachlorodibenzo-p-dioxins<br>Hexachlorodibenzofurans / 3-Iodo-2-propynyl n-butylcarbamate<br>Isolan / Manganese dimethyldithiocarbamate<br>Metam Sodium / Methiocarb<br>Metolcarb / Mexacarbate<br>Molinate / 2-Nitropropane<br>Octachlordibenzo-p-dioxin (OCDD) / Octachlordibenzofuran (OCDF)<br>Oxamyl / Pebulate<br>Pentachlorodibenzo-p-dioxins / Pentachlordibenzofurans<br>Physostigmine / Physostigmine salicylate<br>Potassium dimethyldithiocarbamate / Potassium n-hydroxymethyl-n-methyldithiocarbamate<br>Potassium n-methyldithiocarbamate / Potassium pentachlorophenate<br>Promecarb / Propham<br>Propoxur / Prosulfocarb<br>Selenium, tetrakis(dimethyl-dithiocarbamate) / Sodium dibutyldithiocarbamate<br>Sodium diethylydithiocarbamate / Sodium dimethyldithiocarbamate |

| NRC Citation | NRC Regulatory Language | Discussion of Equivalent Utah Statutory Authority and/or Rules |
|---|---|---|
| | | Sodium pentachlorophenate<br>Tetrabutylthiuram disulfide<br>Tetrachloroethylene<br>2,3,4,6-tetrachlorophenol, sodium salt<br>Thiodicarb<br>Tirpate<br>Toluene-2,6-diamine<br>o-Toluidine<br>Triallate<br>Vernolate<br>Sulfallate<br>Tetrachlorodibenzofurans<br>2,3,4,6-tetrachlorophenol, potassium salt<br>Tetramethylthiuram monosulfide<br>Thiophanate-methyl<br>Toluene-2,4-diamine<br>Toluene-3,4-diamine<br>p-Toluidine<br>Triethylamine<br>Ziram<br><br>**Rule Comparability**: the flexibility of the State rules allows the Executive Secretary to tailor the groundwater monitoring parameters, determine appropriate GWQS and GWPLs, and set groundwater cleanup compliance concentration limits based on the individual waste source term characteristics of each disposal site. NRC Criterion 13 contaminants may be used as a guide in this process. |

# ATTACHMENT 1

Comparison of NRC GWPS (10 CFR 40, Appendix A, Table 5C)
With
Utah Ground Water Quality Standards (UAC R317-6-2)

DRC Spreadsheet NRCgwps.xls
Tabsheet Compare

**Comparison of NRC GWPS vs. Utah DEQ GWQS**

*10 CFR 40, Appendix A, Table 5c vs. Utah Administrative Code (UAC) R317-6-2, Table 1*

| Parameter | CAS No. | Current NRC GWPS 10 CFR 40, Appendix A Table 5C | Utah GWQS (UAC R317-6-2, Table 1) Aug-89 | Utah GWQS (UAC R317-6-2, Table 1) 1/22/02 | EPA Drinking Water Criteria: DW MCL Conc. | DW MCL Effective Date | DW Action Level Conc. | DW Action Level Effective Date | Lifetime Health Advisory Conc | Lifetime Health Advisory Effective Date |
|---|---|---|---|---|---|---|---|---|---|---|
| **Metals (mg/l)** | | | | | *40 CFR 141.62* | | | | | |
| Arsenic | | 0 05 | 0.05 | 0 05 | 0 01 | 1/23/06 | | | | |
| Barium | | 1.0 | 1.0 | 2.0 | 2.0 | 1992 | | | | |
| Cadmium | | 0 01 | 0.01 | 0.005 | 0 005 | 7/30/92 | | | | |
| Chromium | | 0 05 | 0.05 | 0.1 | 0.1 | 7/30/92 | | | | |
| Lead | | 0 05 | 0 05 | 0 015 | | | 0 015 | Jan-92 | | |
| Mercury | | 0 002 | 0.002 | 0 002 | 0 002 | 7/30/92 | | | | |
| Selenium | | 0 01 | 0 01 | 0.05 | 0.05 | 7/30/92 | | | | |
| Silver | | 0 05 | 0 05 | 0.1 | | | | | 0 1 | 1992 |
| | | | | | | | | | | |
| **Organics (mg/l)** | | | | | *40 CFR 141.61* | | | | | |
| Endrin | 72-20-8 | 0 0002 | 0.0002 | 0.002 | 0 002 | 8/17/92 | | | | |
| Lindane | 58-89-9 | 0 004 | 0.004 | 0.0002 | 0.0002 | 7/30/92 | | | | |
| Methoxychlor | 72-43-5 | 0 1 | 0.1 | 0.04 | 0.04 | 7/30/92 | | | | |
| Toxaphene | 8001-35-2 | 0 005 | 0 005 | 0 003 | 0.003 | 7/30/92 | | | | |
| 2,4-D | 94-75-7 | 0.1 | 0.1 | 0.07 | 0 07 | 7/30/92 | | | | |
| 2,4,5-TP Silvex | 93-72-1 | 0 01 | 0 01 | 0.05 | 0 05 | 7/30/92 | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| **Radiologics (pCi/l)** | | | | | *40 CFR 141.66* | | | | | |
| Ra-226+Ra-228 | | 5.0 | 5 0 | 5.0 | 5 0 | | | | | |
| Gross Alpha | | 15.0 | 15.0 | 15.0 | 15 0 | | | | | |

Key to Notes:

| | |
|---|---|
| no shade | = Utah GWQS = NRC GWPS |
| | = Utah GWQS > NRC GWPS |
| | = Utah GWQS < NRC GWPS |

# ATTACHMENT 2

Utah Division of Radiation Control
Comparison of NRC Criterion 13 Contaminants (10 CFR 40, Appendix A)
With
Current EPA List of Hazardous Constituents (40 CFR 261, Appendix VIII)

DRC Spreadsheet NRCriterion13.xls
Tabsheet CompareNRCvsEPA

| NRC Criterion 13 Hazardous Constituents (10 CFR 40, Appendix A) | | | | Equiv | EPA Hazardous Consituents (40 CFR 261, APPENDIX VIII) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NRC | *Promulgated by NRC circa 1987* | | | EPA | EPA | *Last Date of EPA Promulgation: 11/8/00* | | | |
| Order | Hazardous Constituent | Compound Names Parsed by DRC | | Order | Order | (verbatim listing) | | | |
| No. | (verbatim listing) | Chemical Name | Synonym | No | No. | Common name | Chemical abstracts name | CAS No. | HW No |
| | | = parameters found on both lists | | | | | | | |
| | **Bold Red Text** | = parameters dropped by EPA since 1987 | | | **Bold Underline Text** = New Parameters in Current EPA Rules (not found in NRC Criterion 13) | | | | |
| 1 | Acetonitrile (Ethanenitrile) | Acetonitrile | Ethanenitrile | 2 | 1 | **A2213** | Ethanimidothioic acid, 2-(dimethylamino)-N-hydroxy-2-oxo-, methyl ester | 30558-43-1 | U394 |
| 2 | Acetophenone (Ethanone, 1-phenyl) | Acetophenone | Ethanone, 1-phenyl | 3 | 2 | Acetonitrile | Same | 75-05-8 | U003 |
| 3 | 3-(alpha-Acetonylbenzyl)-4-hydroxycoumarin and salts (Warfarin) | Warfarin | 3-(alpha-Acetonylbenzyl)-4-hydroxycoumarin and salts | 475 thru 478 | 3 | Acetophenone | Ethanone, 1-phenyl- | 98-86-2 | U004 |
| 4 | 2-Acetylaminofluorene (Acetamide, N-(9H-fluoren-2-yl)-) | 2-Acetylaminofluorene | Acetamide, N-(9H-fluoren-2-yl)- | 4 | 4 | 2-Acetylaminefluarone | Acetamide, N-9H-fluoren-2-yl- | 53-96-3 | U005 |
| 5 | Acetyl chloride (Ethanoyl chloride) | Acetyl chloride | Ethanoyl chloride | 5 | 5 | Acetyl chloride | Same | 75-36-5 | U006 |
| 6 | 1-Acetyl-2-thiourea (Acetamide, N-(aminothioxomethyl)-) | 1-Acetyl-2-thiourea | Acetamide, N-(aminothioxomethyl)- | 6 | 6 | 1-Acetyl-2-thiourea | Acetamide, N-(aminothioxomethyl)- | 591-08-2 | P002 |
| 7 | Acrolein (2-Propenal) | Acrolein | 2-Propenal | 7 | 7 | Acrolein | 2-Propenal | 107-02-8 | P003 |
| 8 | Acrylamide (2-Propenamide) | Acrylamide | 2-Propenamide | 8 | 8 | Acrylamide | 2-Propenamide | 79-06-1 | U007 |
| 9 | Acrylonitrile (2-Propenenitrile) | Acrylonitrile | 2-Propenenitrile | 9 | 9 | Acrylonitrile | 2-Propenenitrile | 107-13-1 | U009 |
| 10 | Aflatoxins | Aflatoxins | Same | 10 | 10 | Aflatoxins | Same | 1402-68-2 | |
| 11 | Aldrin (1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a,8b-hexahydro-endo, exo-1,4.5,8-Dimethanonaphthalene) | Aldrin | 1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a,8b-hexahydro-endo, exo-1,4.5,8-Dimethanonaphthalene | 13 | 11 | Aldicarb | Propanal, 2-methyl-2-(methylthio)-, O-[(methylamino)carbonyl]oxime | 116-06-3 | P070 |
| 12 | Allyl alcohol (2-Propen-1-ol) | Allyl alcohol | 2-Propen-1-ol | 14 | 12 | **Aldicarb sulfone** | Propanal, 2-methyl-2-(methylsulfonyl) -, O-[(methylamino) carbonyl] oxime | 1646-88-4 | P203 |
| 13 | Aluminum phosphide | Aluminum phosphide | Same | 16 | 13 | Aldrin | 1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-10-hexachloro-1,4,4a,5,8,8a-hexahydro-,(1alpha,4alpha,4abeta,5alpha,8alpha,8abeta)-. | 309-00-2 | P004 |
| 14 | 4-Aminobiphenyl ([1,1'-Biphenyl]-4-amine) | 4-Aminobiphenyl | [1,1'-Biphenyl]-4-amine | 17 | 14 | Allyl alcohol | 2-Propen-1-ol | 107-18-6 | P005 |

| NRC Criterion 13 Hazardous Constituents (10 CFR 40, Appendix A) | | | | Equiv. | EPA Hazardous Consituents (40 CFR 261, APPENDIX VIII) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NRC | *Promulgated by NRC circa 1987* | | | EPA | EPA | *Last Date of EPA Promulgation 11/8/00* | | | |
| Order | Hazardous Constituent | Compound Names Parsed by DRC | | Order | Order | (verbatim listing) | | | |
| No. | (verbatim listing) | Chemical Name | Synonym | No. | No | Common name | Chemical abstracts name | CAS No. | HW No. |
| 15 | 6-Amino-1,1a,2,8,8a,8b-hexahydro-8-(hydroxymethyl)-8a-methoxy-5-methyl-carbamate azirino[2',3'3,4]pyrrolo[1,2-a]indole-4,7-dione, (ester) (Mitomycin C) (Azirino[2'3'3,4]pyrrolo(1,2-a)indole-4,7-dione, 6-amino-8-[((amino-carbonyl)oxy)methyl]-1,1a,2,8,8a,8b-hexa-hydro-8a methoxy-5-methy-) | Mitomycin C | 6-Amino-1,1a,2,8,8a,8b-hexahydro-8-(hydroxymethyl)-8a-methoxy-5-methyl-carbamate azirino[2',3'3,4]pyrrolo[1,2-a]indole-4,7-dione, (ester) or Azirino[2'3'3,4]pyrrolo(1,2-a)indole-4,7-dione, 6-amino-8-[((amino-carbonyl)oxy)methyl]-1,1a,2,8,8a,8b-hexa-hydro-8a methoxy-5-methy- | 296 | 15 | Allyl chloride | 1-Propane, 3-chloro | 107-18-6 | |
| 16 | 5-(Aminomethyl)-3-isoxazolol (3(2H)-Isoxazolone, 5-(aminomethyl)-) | 5-(Aminomethyl)-3-isoxazolol | 3(2H)-Isoxazolone, 5-(aminomethyl)- | 18 | 16 | Aluminum phosphide | Same | 20859-73-8 | P006 |
| 16 | 4-Aminopyridine (4-Pyridinamine) | 4-Aminopyridine | 4-Pyridinamine | 19 | 17 | 4-Aminobiphenyl | [1,1'-Biphenyl]-4-amine | 92-67-1 | |
| 17 | Amitrole (1H-1,2,4-Triazol-3-amine) | Amitrole | 1H-1,2,4-Triazol-3-amine | 20 | 18 | 5-(Aminomethyl)-3-isoxazolol | 3(2H)-Isoxazolone, 5-(aminomethyl)- | 2763-96-4 | P007 |
| 18 | Aniline (Benzenamine) | Aniline | Benzenamine | 22 | 19 | 4-Aminopyridine | 4-Pyridinamine | 504-24-5 | P008 |
| 19 | Antimony and compounds, N.O.S.(3) | Antimony and compounds, N.O.S (3) | Same | 23 & 24 | 20 | Amitrole | 1H-1,2,4-Triazol-3-amine | 61-82-5 | U011 |
| 20 | Aramite (Sulfurous acid, 2-chloroethyl-, 2-[4-(1,1-dimethylethyl) phenoxy]-1-methylethyl ester) | Aramite | Sulfurous acid, 2-chloroethyl-, 2-[4-(1,1-dimethylethyl) phenoxy]-1 methylethyl ester | 25 | 21 | Ammonium vanadate | Vanadic acid, ammonium salt | 7803-55-6 | P119 |
| 21 | Arsenic and compounds, N O S.3 | Arsenic and compounds, N O S.3 | Same | 26 & 27 | 22 | Aniline | Benzenamine | 62-53-3 | U012 |
| 22 | Arsenic acid (Orthoarsenic acid) | Arsenic acid | Orthoarsenic acid | 28 | 23 | Antimony | Same | 7440-36-0 | |
| 23 | Arsenic pentoxide (Arsenic (V) oxide) | Arsenic pentoxide | Arsenic (V) oxide | 29 | 24 | Antimony compounds, N.O S.1 | | | |
| 24 | Arsenic trioxide (Arsenic (III) oxide) | Arsenic trioxide | Arsenic (III) oxide | 30 | 25 | Aramite | Sulfurous acid, 2-chloroethyl 2-[4-(1,1-dimethylethyl)phenoxy]-1-methylethyl ester | 140-57-8 | |
| 25 | Auramine (Benzenamine, 4,4'-carbonimidoylbis[N,N-Dimethyl-, monohydrochloride) | Auramine | Benzenamine, 4,4'-carbonimidoylbis[N,N-Dimethyl-, monohydrochloride | 31 | 26 | Arsenic | Same | 7440-38-2 | |
| 26 | Azaserine (L-Serine, diazoacetate (ester)) | Azaserine | L-Serine, diazoacetate (ester) | 32 | 27 | Arsenic compounds, N.O.S.1 | | | |
| 27 | Barium and compounds, N.O.S.3 | Barium and compounds, N.O.S.3 | Same | 34 & 35 | 28 | Arsenic acid | Arsenic acid H3 AsO4 | 7778-39-4 | P010 |

| NRC Criterion 13 Hazardous Constituents (10 CFR 40, Appendix A) | | | | Equiv. | EPA Hazardous Consituents (40 CFR 261, APPENDIX VIII) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NRC | *Promulgated by NRC circa 1987* | | | EPA | EPA | *Last Date of EPA Promulgation: 11/8/00* | | | |
| Order | Hazardous Constituent | Compound Names Parsed by DRC | | Order | Order | (verbatim listing) | | | |
| No. | (verbatim listing) | Chemical Name | Synonym | No. | No | Common name | Chemical abstracts name | CAS No | HW No. |
| 28 | Barium cyanide | Barium cyanide | Same | 36 | 29 | Arsenic pentoxide | Arsenic oxide As2 O5 | 1303-28-2 | P011 |
| 29 | Benz[c]acridine (3,4-Benzacridine) | Benz[c]acridine | 3,4-Benzacridine | 40 | 30 | Arsenic trioxide | Arsenic oxide As2 O3 | 1327-53-3 | P012 |
| 30 | Benz[a]anthracene (1,2-Benzanthracene) | Benz[a]anthracene | 1,2-Benzanthracene | 41 | 31 | Auramine | Benzenamine, 4,4'-carbonimidoylbis[N,N-dimethyl | 492-80-8 | U014 |
| 31 | Benzene (Cyclohexatriene) | Benzene | Cyclohexatriene | 43 | 32 | Azaserine | L-Serine, diazoacetate (ester) | 115-02-6 | U015 |
| 32 | Benzenearsonic acid (Arsonic acid, phenyl-) | Benzenearsonic acid | Arsonic acid, phenyl- | 44 | 33 | **Barban** | Carbamic acid, (3-chlorophenyl) -, 4-chloro-2-butynyl ester | 101-27-9 | U280 |
| 33 | Benzene, dichloromethyl- (Benzal chloride) | Benzene, dichloromethyl | Benzal chloride | 42 | 34 | Barium | Same | 7440-39-3 | |
| 34 | Benzenethiol (Thiophenol) | Benzenethiol | Thiophenol | 439 | 35 | Barium compounds, N.O.S.1 | | | |
| 35 | Benzidine ([1,1'-Biphenyl]-4,4'diamine) | Benzidine | [1,1'-Biphenyl]-4,4'diamine | 45 | 36 | Barium cyanide | Same | 542-62-1 | P013 |
| 36 | Benzo[b]fluoranthene (2,3-Benzofluoranthene) | Benzo[b]fluoranthene | 2,3-Benzofluoranthene | 46 | 37 | **Bendiocarb** | 1,3-Benzodioxol-4-ol, 2,2-dimethyl-, methyl carbamate | 22781-23-3 | U278 |
| 37 | Benzo[j]fluoranthene (7,8-Benzofluoranthene) | Benzo[j]fluoranthene | 7,8-Benzofluoranthene | 47 | 38 | **Bendiocarb phenol** | 1,3-Benzodioxol-4-ol, 2,2-dimethyl-, | 22961-82-6 | U364 |
| 38 | Benzo[a]pyrene (3,4-Benzopyrene) | Benzo[a]pyrene | 3,4-Benzopyrene | 49 | 39 | **Benomyl** | Carbamic acid, [1- [(butylamino) carbonyl]-1H-benzimidazol-2-yl] -, methyl ester. | 17804-35-2 | U271 |
| 39 | p-Benzoquinone (1,4-Cyclohexadienedione) | p-Benzoquinone | 1,4-Cyclohexadienedione | 50 | 40 | Benz[c]acridine | Same | 225-51-4 | U016 |
| 40 | Benzotrichloride (Benzene, trichloromethyl) | Benzotrichloride | Benzene, trichloromethyl | 51 | 41 | Benz[a]anthracene | Same | 56-55-3 | U018 |
| 41 | Benzyl chloride (Benzene, (chloromethyl)-) | Benzyl chloride | Benzene, (chloromethyl)- | 52 | 42 | Benzal chloride | Benzene, (dichloromethyl)- | 98-87-3 | U017 |
| 42 | Beryllium and compounds, N.O S 3 | Beryllium and compounds, N.O.S.3 | Same | 54 | 43 | Benzene | Same | 71-43-2 | U019 |
| 43 | Bis(2-chloroethoxy)methane (Ethane, 1,1'-[methylenebis(oxy)]bis[2-chloro-]) | Bis(2-chloroethoxy)methane | Ethane, 1,1'-[methylenebis(oxy)]bis[2-chloro-] | 147 | 44 | Benzenearsonic acid | Arsonic acid, phenyl- | 98-05-5 | |
| 44 | Bis(2-chloroethyl) ether (Ethane, 1,1'-oxybis[2-chloro-]) | Bis(2-chloroethyl) ether | Ethane, 1,1'-oxybis[2-chloro-] | 145 | 45 | Benzidine | [1,1'-Biphenyl]-4,4 1-diamine | 92-87-5 | U021 |
| 45 | N,N-Bis(2-chloroethyl)-2-naphthylamine (Chlornaphazine) | Chlornaphazine | N,N-Bis(2-chloroethyl)-2-naphthylamine | 84 | 46 | Benzo[b]fluoranthene | Benz[e]acephenanthrylene | 205-99-2 | |
| 46 | Bis(2-chloroisopropyl) ether (Propane, 2,2'-oxybis[2-chloro-]) | Bis(2-chloroisopropyl) ether | Propane, 2,2'-oxybis[2-chloro-] | 146 | 47 | Benzo[j]fluoranthene | Same | 205-82-3 | |

| NRC Criterion 13 Hazardous Constituents (10 CFR 40, Appendix A) | | | | Equiv. | EPA Hazardous Consituents (40 CFR 261, APPENDIX VIII) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NRC | *Promulgated by NRC circa 1987* | | | EPA | EPA | *Last Date of EPA Promulgation: 11/8/00* | | | |
| Order | Hazardous Constituent | Compound Names Parsed by DRC | | Order | Order | (verbatim listing) | | | |
| No. | (verbatim listing) | Chemical Name | Synonym | No. | No. | Common name | Chemical abstracts name | CAS No | HW No |
| 47 | Bis(chloromethyl) ether (Methane, oxybis[chloro-]) | Bis(chloromethyl) ether | Methane, oxybis[chloro-] | 148 | 48 | **Benzo(k)fluoranthene** | Same | 207-08-9 | |
| 48 | Bis(2-ethylhexyl) phthalate (1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl) ester) | Bis(2-ethylhexyl) phthalate | 1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl) ester | 161 | 49 | Benzo[a]pyrene | Same | 50-32-8 | U022 |
| 49 | Bromoacetone (2-Propanone, 1-bromo-) | Bromoacetone | 2-Propanone, 1-bromo- | 56 | 50 | p-Benzoquinone | 2,5-Cyclohexadiene-1,4-dione | 106-51-4 | U197 |
| 50 | Bromomethane (Methyl bromide) | Bromomethane | Methyl bromide | 276 | 51 | Benzotrichloride | Benzene, (trichloromethyl)- | 98-07-7 | U023 |
| 51 | 4-Bromophenyl phenyl ether (Benzene, 1-bromo-4-phenoxy-) | 4-Bromophenyl phenyl ether | Benzene, 1-bromo-4-phenoxy- | 58 | 52 | Benzyl chloride | Benzene, (chloromethyl)- | 100-44-7 | P028 |
| 52 | Brucine (Strychnidin-10-one, 2,3-dimethoxy-) | Brucine | Strychnidin-10-one, 2,3-dimethoxy- | 59 | 53 | **Beryllium powder** | Same | 7440-41-7 | P015 |
| 53 | 2-Butanone peroxide (Methyl ethyl ketone, peroxide) | 2-Butanone peroxide | Methyl ethyl ketone, peroxide | 285 | 54 | Beryllium compounds, N.O.S.1 | | | |
| 54 | Butyl benzyl phthalate (1,2-Benzenedicarboxylic acid, butyl phenylmethyl ester) | Butyl benzyl phthalate | 1,2-Benzenedicarboxylic acid, butyl phenylmethyl ester | 60 | 55 | **Bis(pentamethylene)-thiuram tetrasulfide** | Piperidine, 1,1'-(tetrathiodicarbonothioyl)-bis- | 120-54-7 | |
| 55 | ***2-sec-Butyl-4,6-dinitrophenol (DNBP) (Phenol, 2,4-dinitro-6-(1-methylpropyl)-)*** | ***2-sec-Butyl-4,6-dinitrophenol (DNBP)*** | ***Phenol, 2,4-dinitro-6-(1-methylpropyl)-*** | N.C. | 56 | Bromoacetone | 2-Propanone, 1-bromo- | 598-31-2 | P017 |
| 56 | Cadmium and compounds, N O.S.3 | Cadmium and compounds, N O.S 3 | Same | 63 & 64 | 57 | Bromoform | Methane, tribromo- | 75-25-2 | U225 |
| 57 | Calcium chromate (Chromic acid, calcium salt) | Calcium chromate | Chromic acid, calcium salt | 65 | 58 | 4-Bromophenyl phenyl ether | Benzene, 1-bromo-4-phenoxy- | 101-55-3 | U030 |
| 58 | Calcium cyanide | Calcium cyanide | Same | 66 | 59 | Brucine | Strychnidin-10-one, 2,3-dimethoxy- | 357-57-3 | P018 |
| 59 | Carbon disulfide (Carbon bisulfide) | Carbon disulfide | Carbon bisulfide | 71 | 60 | Butyl benzyl phthalate | 1,2-Benzenedicarboxylic acid, butyl phenylmethyl ester | 85-68-7 | |
| 60 | Carbon oxyfluoride (Carbonyl fluoride) | Carbon oxyfluoride | Carbonyl fluoride | 72 | 61 | **Butylate** | Carbamothioic acid, bis(2-methylpropyl)-, Sethyl ester | 2008-41-5 | |
| 61 | Chloral (Acetaldehyde, trichloro-) | Chloral | Acetaldehyde, trichloro- | 75 | 62 | Cacodylic acid | Arsinic acid, dimethyl- | 75-60-5 | U136 |
| 62 | Chlorambucil (Butanoic acid, 4-[bis(2-chloroethyl)amino]benzene-) | Chlorambucil | Butanoic acid, 4-[bis(2-chloroethyl)amino]benzene- | 76 | 63 | Cadmium | Same | 7440-43-9 | |
| 63 | Chlordane (alpha and gamma isomers) (4,7-Methanoindan, 1,2,4,5,6,7,8,8-octachloro-3,4,7,7a-tetrahydro-)(alpha and gamma isomers) | Chlordane (alpha and gamma isomers) | 4,7-Methanoindan, 1,2,4,5,6,7,8,8-octachloro-3,4,7,7a-tetrahydro-)(alpha and gamma isomers | 77 & 78 | 64 | Cadmium compounds, N O.S.1 | | | |

| NRC Criterion 13 Hazardous Constituents (10 CFR 40, Appendix A) | | | | Equiv. | EPA Hazardous Consituents (40 CFR 261, APPENDIX VIII) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NRC | *Promulgated by NRC circa 1987* | | | EPA | EPA | *Last Date of EPA Promulgation· 11/8/00* | | | |
| Order | Hazardous Constituent | Compound Names Parsed by DRC | | Order | Order | (verbatim listing) | | | |
| No. | (verbatim listing) | Chemical Name | Synonym | No | No | Common name | Chemical abstracts name | CAS No | HW No |
| 64 | Chlorinated benzenes, N.O.S 3 | Chlorinated benzenes, N.O.S.3 | Same | 79 | 65 | Calcium chromate | Chromic acid H2 CrO4, calcium salt | 13765-19-0 | U032 |
| 65 | Chlorinated ethane, N.O.S 3 | Chlorinated ethane, N.O.S.3 | Same | 80 | 66 | Calcium cyanide | Calcium cyanide Ca(CN)2 | 592-01-8 | P021 |
| 66 | Chlorinated fluorocarbons, N.O.S.3 | Chlorinated fluorocarbons, N.O.S 3 | Same | 81 | 67 | Carbaryl | 1-Naphthalenol, methylcarbamate | 63-25-2 | U279 |
| 67 | Chlorinated naphthalene, N O.S.3 | Chlorinated naphthalene, N.O.S 3 | Same | 82 | 68 | Carbendazim | Carbamic acid, 1H-benzimidazol-2-yl, methyl ester | 10605-21-7 | U372 |
| 68 | Chlorinated phenol, N.O.S.3 | Chlorinated phenol, N.O S 3 | Same | 83 | 69 | Carbofuran | 7-Benzofuranol, 2,3-dihydro-2,2-dimethyl-, methylcarbamate | 1563-66-2 | P127 |
| 69 | Chloroacetaldehyde (Acetaldehyde, chloro-) | Chloroacetaldehyde | Acetaldehyde, chloro- | 85 | 70 | Carbofuran phenol | 7-Benzofuranol, 2,3-dihydro-2,2-dimethyl- | 1563-38-8 | U367 |
| 70 | Chloroalkyl ethers, N.O.S 3 | Chloroalkyl ethers, N.O.S.3 | Same | 86 | 71 | Carbon disulfide | Same | 75-15-0 | P022 |
| 71 | p-Chloroaniline (Benzenamine, 4 chloro-) | p-Chloroaniline | Benzenamine, 4-chloro- | 87 | 72 | Carbon oxyfluoride | Carbonic difluoride | 353-50-4 | U033 |
| 72 | Chlorobenzene (Benzene, chloro ) | Chlorobenzene | Benzene, chloro- | 88 | 73 | Carbon tetrachloride | Methane, tetrachloro- | 56-23-5 | U211 |
| 73 | Chlorobenzilate (Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy- ,ethyl ester) | Chlorobenzilate | Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy-,ethyl ester | 89 | 74 | Carbosulfan | Carbamic acid, [(dibutylamino) thio] methyl-, 2,3-dihydro-2,2-dimethyl-7-benzofuranyl ester | 55285-14-8 | P189 |
| 74 | p-Chloro-m-cresol (Phenol, 4-chloro-3-methyl) | p-Chloro-m-cresol | Phenol, 4-chloro-3-methyl | 90 | 75 | Chloral | Acetaldehyde, trichloro- | 75-87-6 | U034 |
| 75 | 1-Chloro-2,3-epoxypropane (Oxirane, 2-(chloromethyl)-) | 1-Chloro-2,3-epoxypropane | Oxirane, 2-(chloromethyl)- | 201 | 76 | Chlorambucil | Benzenebutanoic acid, 4-[bis(2-chloroethyl)amino]- | 305-03-3 | U035 |
| 76 | 2-Chloroethyl vinyl ether (Ethene, (2-chloroethoxy)-) | 2-Chloroethyl vinyl ether | Ethene, (2-chloroethoxy)- | 91 | 77 | Chlordane | 4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8-octachloro-2,3,3a,4,7,7a-hexahydro- | 57-74-9 | U036 |
| 77 | Chloroform (Methane, trichloro-) | Chloroform | Methane, trichloro- | 92 | 78 | Chlordane (alpha and gamma isomers) | | U036 | |
| 78 | Chloromethane (Methyl chloride) | Chloromethane | Methyl chloride | 277 | 79 | Chlorinated benzenes, N O S.1 | | | |
| 79 | Chloromethyl methyl ether (Methane, chloromethoxy-) | Chloromethyl methyl ether | Methane, chloromethoxy- | 93 | 80 | Chlorinated ethane, N O.S.1 | | | |
| 80 | 2-Chloronaphthalene (Naphthalene, betachloro-) | 2-Chloronaphthalene | Naphthalene, betachloro- | 94 | 81 | Chlorinated fluorocarbons, N.O.S.1 | | | |
| 81 | 2-Chlorophenol (Phenol, o-chloro-) | 2-Chlorophenol | Phenol, o-chloro- | 95 | 82 | Chlorinated naphthalene, N.O.S.1 | | | |
| 82 | 1-(o-Chlorophenyl)thiourea (Thiourea, (2-chlorophenyl)-) | 1-(o-Chlorophenyl)thiourea | Thiourea, (2-chlorophenyl)- | 96 | 83 | Chlorinated phenol, N.O S.1 | | | |

| NRC Criterion 13 Hazardous Constituents (10 CFR 40, Appendix A) | | | | Equiv. | EPA Hazardous Consituents (40 CFR 261, APPENDIX VIII) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NRC | *Promulgated by NRC circa 1987* | | | EPA | EPA | *Last Date of EPA Promulgation· 11/8/00* | | | |
| Order | Hazardous Constituent | Compound Names Parsed by DRC | | Order | Order | (verbatim listing) | | | |
| No. | (verbatim listing) | Chemical Name | Synonym | No | No | Common name | Chemical abstracts name | CAS No | HW No |
| 83 | 3-Chloropropionitrile (Propanenitrile, 3-chloro-) | 3-Chloropropionitrile | Propanenitrile, 3-chloro- | 98 | 84 | Chlornaphazin | Naphthalenamine, N,N'-bis(2-chloroethyl)- | 494-03-1 | U026 |
| 84 | Chromium and compounds, N O S.3 | Chromium and compounds, N.O S 3 | Same | 99 & 100 | 85 | Chloroacetaldehyde | Acetaldehyde, chloro- | 107-20-0 | P023 |
| 85 | Chrysene (1,2-Benzphenanthrene) | Chrysene | 1,2-Benzphenanthrene | 101 | 86 | Chloroalkyl ethers, N O.S.1 | | | |
| 86 | Citrus red No. 2 (2-Naphthol, 1-[(2,5-dimethoxyphenyl)azo]-) | Citrus red No 2 | 2-Naphthol, 1-[(2,5-dimethoxyphenyl)azo]- | 102 | 87 | p-Chloroaniline | Benzenamine, 4-chloro- | 106-47-8 | P024 |
| 87 | Coal tars | Coal tars | Same | 103 | 88 | Chlorobenzene | Benzene, chloro- | 108-90-7 | U037 |
| 88 | Copper cyanide | Copper cyanide | Same | 104 | 89 | Chlorobenzilate | Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy-, ethyl ester | 510-15-6 | U038 |
| 89 | Creosote (Creosote, wood) | Creosote | | 106 | 90 | p-Chloro-m-cresol | Phenol, 4-chloro-3-methyl- | 59-50-7 | U039 |
| 90 | Cresols (Cresylic acid) (Phenol, methyl-) | Cresols (Cresylic acid) | Phenol, methyl- | 107 | 91 | 2-Chloroethyl vinyl ether | Ethene, (2-chloroethoxy)- | 110-75-8 | U042 |
| 91 | Crotonaldehyde (2-Butenal) | Crotonaldehyde | 2-Butenal | 108 | 92 | Chloroform | Methane, trichloro- | 67-66-3 | U044 |
| 92 | Cyanides (soluble salts and complexes), N.O S 3 | Cyanides (soluble salts and complexes), N O S 3 | Same | 110 | 93 | Chloromethyl methyl ether | Methane, chloromethoxy- | 107-30-2 | U046 |
| 93 | Cyanogen (Ethanedinitrile) | Cyanogen | Ethanedinitrile | 111 | 94 | beta-Chloronaphthalene | Naphthalene, 2-chloro- | 91-58-7 | U047 |
| 94 | Cyanogen bromide (Bromine cyanide) | Cyanogen bromide | Bromine cyanide | 112 | 95 | o-Chlorophenol | Phenol, 2-chloro- | 95-57-8 | U048 |
| 95 | Cyanogen chloride (Chlorine cyanide) | Cyanogen chloride | Chlorine cyanide | 113 | 96 | 1-(o-Chlorophenyl)thiourea | Thiourea, (2-chlorophenyl)- | 5344-82-1 | P026 |
| 96 | Cycasin (beta-D-Glucopyranoside, (methyl-ONN-azoxy)methyl-) | Cycasin | beta-D-Glucopyranoside, (methyl-ONN-azoxy)methyl- | 114 | 97 | **Chloroprene** | 1,3-Butadiene, 2-chloro- | 126-99-8 | |
| 97 | 2-Cyclohexyl-4,6-dinitrophenol (Phenol, 2-cyclohexyl-4,6-dinitro-) | 2-Cyclohexyl-4,6-dinitrophenol | Phenol, 2-cyclohexyl-4,6-dinitro- | 116 | 98 | 3-Chloropropionitrile | Propanenitrile, 3-chloro- | 542-76-7 | P027 |
| 98 | Cyclophosphamide (2H-1,3,2,-Oxazaphosphorine, [bis(2-chloroethyl) amino]-tetrahydro-,2-oxide) | Cyclophosphamide | 2H-1,3,2,-Oxazaphosphorine, [bis(2-chloroethyl)amino-tetrahydro-,2-oxide | 117 | 99 | Chromium | Same | 7440-47-3 | |
| 99 | Daunomycin (5,12-Naphthacenedione, (8S-cis)-8-acetyl-10-[(3-amino-2,3,6-trideoxy)-alpha-L-lyxohexopyranosyl)oxy]-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-) | Daunomycin | 5,12-Naphthacenedione, (8S-cis)-8-acetyl-10-[(3-amino-2,3,6-trideoxy)-alpha-L-lyxohexopyranosyl)oxy]-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy- | 120 | 100 | Chromium compounds, N O S.1 | | | |

| NRC Criterion 13 Hazardous Constituents (10 CFR 40, Appendix A) | | | | Equiv. | EPA Hazardous Consituents (40 CFR 261, APPENDIX VIII) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NRC | *Promulgated by NRC circa 1987* | | | EPA | EPA | *Last Date of EPA Promulgation: 11/8/00* | | | |
| Order | Hazardous Constituent | Compound Names Parsed by DRC | | Order | Order | (verbatim listing) | | | |
| No. | (verbatim listing) | Chemical Name | Synonym | No | No. | Common name | Chemical abstracts name | CAS No | HW No. |
| 100 | DDD (Dichlorodiphenyldichloroethane) (Ethane, 1,1-dichloro-2,2-bis(p-chlorophenyl)-) | DDD (Dichlorodiphenyldichloroethane) | Ethane, 1,1-dichloro-2,2-bis(p-chlorophenyl)- | 122 | 101 | Chrysene | Same | 218-01-9 | U050 |
| 101 | DDE (Ethylene, 1,1-dichloro-2,2-bis(4-chlorophenyl)-) | DDE | Ethylene, 1,1-dichloro-2,2-bis(4-chlorophenyl)- | 123 | 102 | Citrus red No. 2 | 2-Naphthalenol, 1-[(2,5-dimethoxyphenyl)azo]- | 6358-53-8 | |
| 102 | DDT (Dichlorodiphenyltrichloroethane) (Ethane, 1,1,1-trichloro-2,2-bis (p-chlorophenyl)-) | DDT (Dichlorodiphenyltrichloroethane) | Ethane, 1,1,1-trichloro-2,2-bis (p-chlorophenyl)- | 124 | 103 | Coal tar creosote | Same | 8007-45-2 | |
| 103 | Diallate (S-(2,3-dichloroallyl) diisopropylthiocarbamate) | Diallate | S-(2,3-dichloroallyl) diisopropylthiocarbamate | 125 | 104 | Copper cyanide | Copper cyanide CuCN | 544-92-3 | P029 |
| 104 | Dibenz[a,h]acridine (1,2,5,6-Dibenzacridine) | Dibenz[a,h]acridine | 1,2,5,6-Dibenzacridine | 126 | 105 | **Copper dimethyldithiocarbamate** | Copper, bis(dimethylcarbamodithioato-S,S')- | 137-29-1 | |
| 105 | Dibenz[a,j]acridine (1,2,7,8-Dibenzacridine) | Dibenz[a,j]acridine | 1,2,7,8-Dibenzacridine | 127 | 106 | Creosote | Same | | U051 |
| 106 | Dibenz[a,h]anthracene (1,2,5,6-Dibenzanthracene) | Dibenz[a,h]anthracene | 1,2,5,6-Dibenzanthracene | 128 | 107 | Cresol (Cresylic acid) | Phenol, methyl- | 1319-77-3 | U052 |
| 107 | 7H-Dibenzo[c,g]carbazole (3,4,5,6-Dibenzcarbazole) | 7H-Dibenzo[c,g]carbazole | 3,4,5,6-Dibenzcarbazole | 129 | 108 | Crotonaldehyde | 2-Butenal | 4170-30-3 | U053 |
| 108 | Dibenzo[a,e]pyrene (1,2,4,5-Dibenzpyrene) | Dibenzo[a,e]pyrene | 1,2,4,5-Dibenzpyrene | 130 | 109 | **m-Cumenyl methylcarbamate** | Phenol, 3-(methylethyl)-, methyl carbamate | 64-00-6 | P202 |
| 109 | Dibenzo[a,h]pyrene (1,2,5,6-Dibenzpyrene) | Dibenzo[a,h]pyrene | 1,2,5,6-Dibenzpyrene | 131 | 110 | Cyanides (soluble salts and complexes) N O.S 1 | | | P030 |
| 110 | Dibenzo[a,i]pyrene (1,2,7,8-Dibenzpyrene) | Dibenzo[a,i]pyrene | 1,2,7,8-Dibenzpyrene | 132 | 111 | Cyanogen | Ethanedinitrile | 460-19-5 | P031 |
| 111 | 1,2-Dibromo-3-chloropropane (Propane, 1,2-dibromo-3-chloro-) | 1,2-Dibromo-3-chloropropane | Propane, 1,2-dibromo-3-chloro- | 133 | 112 | Cyanogen bromide | Cyanogen bromide (CN)Br | 506-68-3 | U246 |
| 112 | 1,2-Dibromoethane (Ethylene dibromide) | 1,2-Dibromoethane | Ethylene dibromide | 209 | 113 | Cyanogen chloride | Cyanogen chloride (CN)Cl | 506-77-4 | P033 |
| 113 | Dibromomethane (Methylene bromide) | Dibromomethane | Methylene bromide | 282 | 114 | Cycasin | beta-D-Glucopyranoside, (methyl-ONNazoxy) methyl | 14901-08-7 | |
| 114 | Di-n-butyl phthalate (1,2-Benzenedicarboxylic acid, dibutyl ester) | Di-n-butyl phthalate | 1,2-Benzenedicarboxylic acid, dibutyl ester | 134 | 115 | **Cycloate** | Carbamothioic acid, cyclohexylethyl-, S-ethyl ester | 1134-23-2 | |
| 115 | o-Dichlorobenzene (Benzene, 1,2-dichloro-) | o-Dichlorobenzene | Benzene, 1,2-dichloro- | 135 | 116 | 2-Cyclohexyl-4,6-dinitrophenol | Phenol, 2-cyclohexyl-4,6-dinitro- | 131-89-5 | P034 |
| 116 | m-Dichlorobenzene (Benzene, 1,3-dichloro-) | m-Dichlorobenzene | Benzene, 1,3-dichloro- | 136 | 117 | Cyclophosphamide | 2H-1,3,2-Oxazaphosphorin-2-amine, N,Nbis(2-chloroethyl)tetrahydro-, 2-oxide | 50-18-0 | U058 |
| 117 | p-Dichlorobenzene (Benzene, 1,4-dichloro-) | p-Dichlorobenzene | Benzene, 1,4-dichloro- | 137 | 118 | 2,4-D | Acetic acid, (2,4-dichlorophenoxy)- | 94-75-7 | U240 |

| NRC Criterion 13 Hazardous Constituents (10 CFR 40, Appendix A) | | | | Equiv. | EPA Hazardous Consituents (40 CFR 261, APPENDIX VIII) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NRC | *Promulgated by NRC circa 1987* | | | EPA | EPA | *Last Date of EPA Promulgation· 11/8/00* | | | |
| Order | Hazardous Constituent | Compound Names Parsed by DRC | | Order | Order | (verbatim listing) | | | |
| No | (verbatim listing) | Chemical Name | Synonym | No. | No | Common name | Chemical abstracts name | CAS No | HW No. |
| 118 | Dichlorobenzene, N O S 3 (Benzene, dichloro-, N.O.S 3) | Dichlorobenzene, N.O.S 3 | Benzene, dichloro-, N O.S 3 | 138 | 119 | 2,4-D, salts, esters | | | U240 |
| 119 | 3,3'-Dichlorobenzidine ([1,1'-Biphenyl]-4,4'-diamine, 3,3'-dichloro-) | 3,3'-Dichlorobenzidine | [1,1'-Biphenyl]-4,4'-diamine, 3,3'-dichloro- | 139 | 120 | Daunomycin | 5,12-Naphthacenedione, 8-acetyl-10-[(3-amino-2,3,6-trideoxy-alpha-L-lyxohexopyranosyl)oxy]-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-, (8S-cis)- | 20830-81-3 | U059 |
| 120 | 1,4-Dichloro-2-butene (2-Butene, 1,4-dichloro-) | 1,4-Dichloro-2-butene | 2-Butene, 1,4-dichloro- | 140 | 121 | Dazomet | 2H-1,3,5-thiadiazine-2-thione, tetrahydro-3,5-dimethyl | 533-74-4 | |
| 121 | Dichlorodifluoromethane (Methane, dichlorodifluoro-) | Dichlorodifluoromethane | Methane, dichlorodifluoro- | 141 | 122 | DDD | Benzene, 1,1'-(2,2-dichloroethylidene)bis[4-chloro- | 72-54-8 | U060 |
| 122 | 1,1-Dichloroethane (Ethylidene dichloride) | 1,1-Dichloroethane | Ethylidene dichloride | 215 | 123 | DDE | Benzene, 1,1'-(dichloroethenylidene)bis[4-chloro- | 72-55-9 | .... |
| 123 | 1,2-Dichloroethane (Ethylene dichloride) | 1,2-Dichloroethane | Ethylene dichloride | 210 | 124 | DDT | Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4-chloro- | 50-29-3 | U061 |
| 124 | trans-1,2-Dichloroethene (1,2-Dichloroethylene) | trans-1,2-Dichloroethene | 1,2-Dichloroethylene | 144 | 125 | Diallate | Carbamothioic acid, bis(1-methylethyl)-, S-(2,3-dichloro-2-propenyl) ester | 2303-16-4 | U062 |
| 125 | Dichloroethylene, N.O.S 3 (Ethene, dichloro-, N.O.S.3) | Dichloroethylene, N O.S 3 | Ethene, dichloro-, N O.S 3 | 142 | 126 | Dibenz[a,h]acridine | Same | 226-36-8 | |
| 126 | 1,1-Dichloroethylene (Ethene, 1,1-dichloro-) | 1,1-Dichloroethylene | Ethene, 1,1-dichloro- | 143 | 127 | Dibenz[a,j]acridine | Same | 224-42-0 | |
| 127 | Dichloromethane (Methylene chloride) | Dichloromethane | Methylene chloride | 283 | 128 | Dibenz[a,h]anthracene | Same | 53-70-3 | U063 |
| 128 | 2,4-Dichlorophenol (Phenol, 2,4-dichloro-) | 2,4-Dichlorophenol | Phenol, 2,4-dichloro- | 149 | 129 | 7H-Dibenzo[c,g]carbazole | Same | 194-59-2 | |
| 129 | 2,6-Dichlorophenol (Phenol, 2,6-dichloro-) | 2,6-Dichlorophenol | Phenol, 2,6-dichloro- | 150 | 130 | Dibenzo[a,e]pyrene | Naphtho[1,2,3,4-def]chrysene | 192-65-4 | |
| 130 | 2,4-Dichlorophenoxyacetic acid (2,4-D), salts and esters (Acetic acid, 2,4-dichlorophenoxy-, salts and esters) | 2,4-Dichlorophenoxyacetic acid (2,4-D) salts and esters | Acetic acid, 2,4-dichlorophenoxy-, salts and esters | 118 & 119 | 131 | Dibenzo[a,h]pyrene | Dibenzo[b,def]chrysene | 189-64-0 | |
| 131 | Dichlorophenylarsine (Phenyl dichloroarsine) | Dichlorophenylarsine | Phenyl dichloroarsine | 151 | 132 | Dibenzo[a,i]pyrene | Benzo[rst]pentaphene | 189-55-9 | U064 |
| 132 | Dichloropropane, N O.S.3 (Propane, dichloro-, N.O.S.3) | Dichloropropane, N.O S. 3 | Propane, dichloro-, N O.S 3 | 152 | 133 | 1,2-Dibromo-3-chloropropane | Propane, 1,2-dibromo-3-chloro- | 96-12-8 | U066 |
| 133 | 1,2-Dichloropropane (Propylene dichloride) | 1,2-Dichloropropane | Propylene dichloride | 379 | 134 | Dibutyl phthalate | 1,2-Benzenedicarboxylic acid, dibutyl ester | 84-74-2 | U069 |

| NRC Criterion 13 Hazardous Constituents (10 CFR 40, Appendix A) | | | | Equiv. | EPA Hazardous Consituents (40 CFR 261, APPENDIX VIII) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NRC | *Promulgated by NRC circa 1987* | | | EPA | EPA | *Last Date of EPA Promulgation: 11/8/00* | | | |
| Order | Hazardous Constituent | Compound Names Parsed by DRC | | Order | Order | (verbatim listing) | | | |
| No | (verbatim listing) | Chemical Name | Synonym | No. | No | Common name | Chemical abstracts name | CAS No | HW No. |
| 134 | Dichloropropanol, N O.S.3 (Propanol, dichloro-, N O S 3) | Dichloropropanol, N.O.S. 3 | Propanol, dichloro-, N.O S 3 | 153 | 135 | o-Dichlorobenzene | Benzene, 1,2-dichloro- | 95-50-1 | U070 |
| 135 | Dichloropropene, N.O S.3 (Propene, dichloro-, N.O.S 3) | Dichloropropene, N.O.S. 3 | Propene, dichloro-, N O S 3 | 154 | 136 | m-Dichlorobenzene | Benzene, 1,3-dichloro- | 541-73-1 | U071 |
| 136 | 1,3-Dichloropropene (1-Propene, 1,3-dichloro-) | 1,3-Dichloropropene | 1-Propene, 1,3-dichloro- | 155 | 137 | p-Dichlorobenzene | Benzene, 1,4-dichloro- | 106-46-7 | U072 |
| 137 | Dieldin (1,2,3,4,10.10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octa-hydro-endo, exo- 1,4:5,8-Dimethanonaphthalene) | Dieldin | 1,2,3,4,10.10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octa-hydro-endo, exo- 1,4:5,8-Dimethanonaphthalene | 156 | 138 | Dichlorobenzene, N.O S.1 | Benzene, dichloro- | 25321-22-6 | |
| 138 | 1,2:3,4-Diepoxybutane (2,2'-Bioxirane) | 1,2:3,4-Diepoxybutane | 2,2'-Bioxirane | 157 | 139 | 3,3'-Dichlorobenzidine | [1,1'-Biphenyl]-4,4'-diamine, 3,3'-dichloro- | 91-94-1 | U073 |
| 139 | Diethylarsine (Arsine, diethyl-) | Diethylarsine | Arsine, diethyl- | 158 | 140 | 1,4-Dichloro-2-butene | 2-Butene, 1,4-dichloro- | 764-41-0 | U074 |
| 140 | N,N-Diethylhydrazine (Hydrazine, 1,2-diethyl) | N,N-Diethylhydrazine | Hydrazine, 1,2-diethyl | 162 | 141 | Dichlorodifluoromethane | Methane, dichlorodifluoro- | 75-71-8 | U075 |
| 141 | O,O-Diethyl S-methyl ester of phosphorodithioic acid (Phosphorodithioic acid, O,O-diethyl S-methyl ester) | O,O-Diethyl S-methyl ester of phosphorodithioic acid | Phosphorodithioic acid, O,O-diethyl S-methyl ester | 163 | 142 | Dichloroethylene, N.O.S.1 | Dichloroethylene | 25323-30-2 | |
| 142 | O,O-Diethylphosphoric acid, O-p-nitrophenyl ester (Phosphoric acid, diethyl p-nitrophenyl ester) | O,O-Diethylphosphoric acid, O-p-nitrophenyl ester | Phosphoric acid, diethyl p-nitrophenyl ester | 164 | 143 | 1,1-Dichloroethylene | Ethene, 1,1-dichloro- | 75-35-4 | U078 |
| 143 | Diethyl phthalate (1,2-Benzenedicarboxylic acid, diethyl ester) | Diethyl phthalate | 1,2-Benzenedicarboxylic acid, diethyl ester | 165 | 144 | 1,2-Dichloroethylene | Ethene, 1,2-dichlrol-, (E)- | 156-60-5 | U079 |
| 144 | O,O-Diethyl O-2-pyrazinyl phosphorothioate (Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester) | O,O-Diethyl O-2-pyrazinyl phosphorothioate | Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester | 166 | 145 | Dichloroethyl ether | Ethane, 1,1'oxybis[2-chloro- | 111-44-4 | U025 |
| 145 | Diethylstilbesterol (4,4'-Stilbenediol,alpha,alpha-diethyl, bis(dihydrogen phosphate, (E)-) | Diethylstilbesterol | 4,4'-Stilbenediol,alpha,alpha-diethyl, bis(dihydrogen phosphate, (E)- | 167 | 146 | Dichloroisopropyl ether | Propane, 2,2'-oxybis[2-chloro-] | 108-60-1 | U027 |
| 146 | Dihydrosafrole (Benzene, 1,2-methylenedioxy-4-propyl-) | Dihydrosafrole | Benzene, 1,2-methylenedioxy-4-propyl- | 168 | 147 | Dichloromethoxy ethane | Ethane, 1,1'-[methylenebis(oxy)]bis[2-chloro-] | 111-91-1 | U024 |
| 147 | 3,4-Dihydroxy-alpha-(methylamino)methyl benzyl alcohol (1,2-Benzenediol, 4-[1-hydroxy-2-(methylamino)ethyl]-) | 3,4-Dihydroxy-alpha-(methylamino)methyl benzyl alcohol | 1,2-Benzenediol, 4-[1-hydroxy-2-(methylamino)ethyl]- | 202 | 148 | Dichloromethyl ether | Methane, oxybis[chloro- | 542-88-1 | P016 |

| NRC Criterion 13 Hazardous Constituents (10 CFR 40, Appendix A) | | | | Equiv. | EPA Hazardous Consituents (40 CFR 261, APPENDIX VIII) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NRC | *Promulgated by NRC circa 1987* | | | EPA | EPA | *Last Date of EPA Promulgation: 11/8/00* | | | |
| Order | Hazardous Constituent | Compound Names Parsed by DRC | | Order | Order | (verbatim listing) | | | |
| No. | (verbatim listing) | Chemical Name | Synonym | No. | No. | Common name | Chemical abstracts name | CAS No. | HW No. |
| 148 | Diisopropylfluorophosphate (DFP) (Phosphorofluoridic acid, bis(1-methylethyl) ester) | Diisopropylfluorophosphate (DFP) | Phosphorofluoridic acid, bis(1-methylethyl) ester | 169 | 149 | 2,4-Dichlorophenol | Phenol, 2,4-dichloro- | 120-83-2 | U081 |
| 149 | Dimethoate (Phosphorodithioic acid, O,O-dimethyl S-[2-(methylamino)-2-oxoethyl] ester) | Dimethoate | Phosphorodithioic acid, O,O-dimethyl S-[2-(methylamino)-2-oxoethyl] ester | 170 | 150 | 2,6-Dichlorophenol | Phenol, 2,6-dichloro- | 87-65-0 | U082 |
| 150 | 3,3'-Dimethoxybenzidine ([1,1'-Biphenyl]- 4,4'-diamine, 3-3'-dimethoxy-) | 3,3'-Dimethoxybenzidine | [1,1'-Biphenyl]- 4,4'-diamine, 3-3' dimethoxy- | 171 | 151 | Dichlorophenylarsine | Arsonous dichloride, phenyl- | 696-28-6 | P036 |
| 151 | p-Dimethylaminoazobenzene (Benzenamine, N,N-dimethyl-4-(phenylazo)-) | p-Dimethylaminoazobenzene | Benzenamine, N,N-dimethyl-4-(phenylazo)- | 172 | 152 | Dichloropropane, N O S.1 | Propane, dichloro- | 26638-19-7 | |
| 152 | 7,12-Dimethylbenz[a]anthracene (1,2-Benzanthracene, 7,12-dimethyl-) | 7,12-Dimethylbenz[a]anthracene | 1,2-Benzanthracene, 7,12-dimethyl- | 173 | 153 | Dichloropropanol, N.O.S 1 | Propanol, dichloro- | 26545-73-3 | |
| 153 | 3,3'-Dimethylbenzidine ([1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethyl-) | 3,3'-Dimethylbenzidine | [1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethyl- | 174 | 154 | Dichloropropene, N O.S.1 | 1-Propene, dichloro- | 26952-23-8 | |
| 154 | Dimethylcarbamoyl chloride (Carbamoyl chloride, dimethyl-) | Dimethylcarbamoyl chloride | Carbamoyl chloride, dimethyl- | 175 | 155 | 1,3-Dichloropropene | 1-Propene, 1,3-dichloro- | 542-75-6 | U084 |
| 155 | 1,1-Dimethylhydrazine (Hydrazine, 1,1-dimethyl-) | 1,1-Dimethylhydrazine | Hydrazine, 1,1-dimethyl- | 176 | 156 | Dieldrin | 2,7.3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro 1a,2,2a,3,6,6a,7,7a-octahydro-,(1aalpha,2beta,2aalpha,3beta,6beta,6aalpha,7beta,7aalpha)- | 60-57-1 | P037 |
| 156 | 1,2-Dimethylhydrazine (Hydrazine, 1,2-dimethyl-) | 1,2-Dimethylhydrazine | Hydrazine, 1,2-dimethyl- | 177 | 157 | 1,2:3,4-Diepoxybutane | 2,2'-Bioxirane | 1464-53-5 | U085 |
| 157 | 3,3-Dimethyl-1-(methylthio)-2-butanone, O-[(methylamino) carbonyl] oxime (Thiofanox) | Thiofanox | 3,3-Dimethyl-1-(methylthio)-2-butanone, O-[(methylamino) carbonyl] oxime | 436 | 158 | Diethylarsine | Arsine, diethyl- | 692-42-2 | P038 |
| 158 | alpha,alpha-Dimethylphenethylamine (Ethanamine, 1,1-dimethyl-2-phenyl-) | alpha,alpha-Dimethylphenethylamine | Ethanamine, 1,1-dimethyl-2-phenyl- | 178 | 159 | Diethylene glycol, dicarbamate | Ethanol, 2,2'-oxybis-, dicarbamate | 5952-26-1 | U395 |
| 159 | 2,4-Dimethylphenol (Phenol, 2,4-dimethyl-) | 2,4-Dimethylphenol | Phenol, 2,4-dimethyl- | 179 | 160 | 1,4-Diethyleneoxide | 1,4-Dioxane | 123-91-1 | U108 |

| NRC Criterion 13 Hazardous Constituents (10 CFR 40, Appendix A) | | | | Equiv. | EPA Hazardous Consituents (40 CFR 261, APPENDIX VIII) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NRC | *Promulgated by NRC circa 1987* | | | EPA | EPA | *Last Date of EPA Promulgation: 11/8/00* | | | |
| Order | Hazardous Constituent | Compound Names Parsed by DRC | | Order | Order | (verbatim listing) | | | |
| No. | (verbatim listing) | Chemical Name | Synonym | No. | No | Common name | Chemical abstracts name | CAS No. | HW No |
| 160 | Dimethyl phthalate (1,2-Benzenedicarboxylic acid, dimethyl ester) | Dimethyl phthalate | 1,2-Benzenedicarboxylic acid, dimethyl ester | 180 | 161 | Diethylhexyl phthalate | 1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl) ester | 117-81-7 | U028 |
| 161 | Dimethyl sulfate (Sulfuric acid, dimethyl ester) | Dimethyl sulfate | Sulfuric acid, dimethyl ester | 181 | 162 | N,N'-Diethylhydrazine | Hydrazine, 1,2-diethyl- | 1615-80-1 | U086 |
| 162 | Dinitrobenzene, N O S.3 (Benzene, dinitro-, N.O.S 3) | Dinitrobenzene, N.O.S. 3 | Benzene, dinitro-, N.O.S 3 | 183 | 163 | O,O-Diethyl S-methyl dithiophosphate | Phosphorodithioic acid, O,O-diethyl S-methyl ester | 3288-58-2 | U087 |
| 163 | 4,6-Dinitro-o-cresol and salts (Phenol, 2,4-dinitro-6-methyl-, and salts) | 4,6-Dinitro-o-cresol and salts | Phenol, 2,4-dinitro-6-methyl-, and salts | 184 & 185 | 164 | Diethyl-p-nitrophenyl phosphate | Phosphoric acid, diethyl 4-nitrophenyl ester | 311-45-5 | P041 |
| 164 | 2,4-Dinitrophenol (Phenol, 2,4-dinitro-) | 2,4-Dinitrophenol | Phenol, 2,4-dinitro- | 186 | 165 | Diethyl phthalate | 1,2-Benzenedicarboxylic acid, diethyl ester | 84-66-2 | U088 |
| 165 | 2,4-Dinitrotoluene (Benzene, 1-methyl-2,4-dinitro-) | 2,4-Dinitrotoluene | Benzene, 1-methyl-2,4-dinitro- | 187 | 166 | O,O-Diethyl O-pyrazinyl phosphoro-thioate | Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester | 297-97-2 | P040 |
| 166 | 2,6-Dinitrotoluene (Benzene, 1-methyl-2,6-dinitro-) | 2,6-Dinitrotoluene | Benzene, 1-methyl-2,6-dinitro- | 188 | 167 | Diethylstilbesterol | Phenol, 4,4'-(1,2-diethyl-1,2-ethenediyl)bis-, (E)- | 56-53-1 | U089 |
| 167 | Di-n-octyl phthalate (1,2-Benzenedicarboxylic acid, dioctyl ester) | Di-n-octyl phthalate | 1,2-Benzenedicarboxylic acid, dioctyl ester | 190 | 168 | Dihydrosafrole | 1,3-Benzodioxole, 5-propyl- | 94-58-6 | U090 |
| 168 | 1,4-Dioxane (1,4-Diethylene oxide) | 1,4-Dioxane | 1,4-Diethylene oxide | 160 | 169 | Diisopropylfluorophosphate (DFP) | Phosphorofluoridic acid, bis(1-methylethyl) ester | 55-91-4 | P043 |
| 169 | Diphenylamine (Benzenamine, N phenyl-) | Diphenylamine | Benzenamine, N-phenyl- | 191 | 170 | Dimethoate | Phosphorodithioic acid, O,O-dimethyl S-[2-(methylamino)-2-oxoethyl] ester | 60-51-5 | P044 |
| 170 | 1,2-Diphenylhydrazine (Hydrazine, 1,2-diphenyl-) | 1,2-Diphenylhydrazine | Hydrazine, 1,2-diphenyl- | 192 | 171 | 3,3'-Dimethoxybenzidine | [1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethoxy- | 119-90-4 | U091 |
| 171 | Di-n-propylnitrosamine (N-Nitroso-di-n-propylamine) | Di-n-propylnitrosamine | N-Nitroso-di-n-propylamine | 193 | 172 | p-Dimethylaminoazobenzene | Benzenamine, N,N-dimethyl-4-(phenylazo)- | 60-11-7 | U093 |
| 172 | Disulfoton (O,O-diethyl S-[2-(ethylthio)ethyl] phosphorodithioate) | Disulfoton | O,O-diethyl S-[2-(ethylthio)ethyl] phosphorodithioate | 195 | 173 | 7,12-Dimethylbenz[a]anthracene | Benz[a]anthracene, 7,12-dimethyl- | 57-97-6 | U094 |
| 173 | 2,4-Dithiobiuret (Thioimidodicarbonic diamide) | 2,4-Dithiobiuret | Thioimidodicarbonic diamide | 196 | 174 | 3,3'-Dimethylbenzidine | [1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethyl- | 119-93-7 | U095 |
| 174 | Endosulfan (5-Norbornene, 2,3-dimethanol, 1,4,5,6,7,7-hexachloro-, cyclic sulfite) | Endosulfan | 5-Norbornene, 2,3-dimethanol, 1,4,5,6,7,7-hexachloro-, cyclic sulfite | 197 | 175 | Dimethylcarbamoyl chloride | Carbamic chloride, dimethyl- | 79-44-7 | U097 |
| 175 | Endrin and metabolites (1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-endo,endo-1,4:5,8-dimethanonaphthalene, and metabolites) | Endrin and metabolites | 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-endo,endo-1,4:5,8-dimethanonaphthalene, and metabolites | 199 & 200 | 176 | 1,1-Dimethylhydrazine | Hydrazine, 1,1-dimethyl- | 57-14-7 | U098 |
| 176 | Ethyl carbamate (Urethan) (Carbamic acid, ethyl ester) | Ethyl carbamate (Urethan) | Carbamic acid, ethyl ester | 204 | 177 | 1,2-Dimethylhydrazine | Hydrazine, 1,2-dimethyl- | 540-73-8 | U099 |

| NRC Criterion 13 Hazardous Constituents (10 CFR 40, Appendix A) | | | | Equiv. | EPA Hazardous Consituents (40 CFR 261, APPENDIX VIII) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NRC | *Promulgated by NRC circa 1987* | | | EPA | EPA | *Last Date of EPA Promulgation. 11/8/00* | | | |
| Order | Hazardous Constituent | Compound Names Parsed by DRC | | Order | Order | (verbatim listing) | | | |
| No. | (verbatim listing) | Chemical Name | Synonym | No. | No. | Common name | Chemical abstracts name | CAS No | HW No. |
| 177 | Ethyl cyanide (propanenitrile) | Ethyl cyanide | propanenitrile | 205 | 178 | alpha,alpha-Dimethylphenethylamine | Benzeneethanamine, alpha,alpha-dimethyl- | 122-09-8 | P046 |
| 178 | Ethylenebisdithiocarbamic acid, salts and esters (1,2-Ethanediyl-biscarbamodithioic acid, salts and esters) | Ethylenebisdithiocarbamic acid, salts and esters | 1,2-Ethanediyl-biscarbamodithioic acid, salts and esters | 207 & 208 | 179 | 2,4-Dimethylphenol | Phenol, 2,4-dimethyl- | 105-67-9 | U101 |
| 179 | Ethyleneimine (Aziridine) | Ethyleneimine | Aziridine | 212 | 180 | Dimethyl phthalate | 1,2-Benzenedicarboxylic acid, dimethyl ester | 131-11-3 | U102 |
| 180 | Ethylene oxide (Oxirane) | Ethylene oxide | Oxirane | 213 | 181 | Dimethyl sulfate | Sulfuric acid, dimethyl ester | 77-78-1 | U103 |
| 181 | Ethylenethiourea (2-Imidazolidinethione) | Ethylenethiourea | 2-Imidazolidinethione | 214 | 182 | **Dimetilan** | Carbamic acid, dimethyl-, 1-[(dimethylamino) carbonyl]-5-methyl-1H-pyrazol-3-yl ester | 644-64-4 | P191 |
| 182 | Ethyl methacrylate (2-Propenoic acid, 2-methyl-, ethyl ester) | Ethyl methacrylate | 2-Propenoic acid, 2-methyl-, ethyl ester | 216 | 183 | Dinitrobenzene, N.O.S.1 | Benzene, dinitro- | 25154-54-5 | |
| 183 | Ethyl methanesulfonate (Methanesulfonic acid, ethyl ester) | Ethyl methanesulfonate | Methanesulfonic acid, ethyl ester | 217 | 184 | 4,6-Dinitro-o-cresol | Phenol, 2-methyl-4,6-dinitro- | 534-52-1 | P047 |
| 184 | Fluoranthene (Benzo[j,k]fluorene) | Fluoranthene | Benzo[j,k]fluorene | 220 | 185 | 4,6-Dinitro-o-cresol salts | | | P047 |
| 185 | Fluorine | Fluorine | Same | 221 | 186 | 2,4-Dinitrophenol | Phenol, 2,4-dinitro- | 51-28-5 | P048 |
| 186 | 2-Fluoroacetamide (Acetamide, 2-fluoro-) | 2-Fluoroacetamide | Acetamide, 2-fluoro- | 222 | 187 | 2,4-Dinitrotoluene | Benzene, 1-methyl-2,4-dinitro- | 121-14-2 | U105 |
| 187 | Fluoroacetic acid, sodium salt (Acetic acid, fluoro-, sodium salt) | Fluoroacetic acid | Acetic acid, fluoro-, sodium salt | 223 | 188 | 2,6-Dinitrotoluene | Benzene, 2-methyl-1,3-dinitro- | 606-20-2 | U106 |
| 188 | Formaldehyde (Methylene oxide) | Formaldehyde | Methylene oxide | 224 | 189 | **Dinoseb** | Phenol, 2-(1-methylpropyl)-4,6-dinitro- | 88-85-7 | P020 |
| 189 | Formic acid (Methanoic acid) | Formic acid | Methanoic acid | 226 | 190 | Di-n-octyl phthalate | 1,2-Benzenedicarboxylic acid, dioctyl ester | 117-84-0 | U017 |
| 190 | Glycidylaldehyde (1-Propanol-2,3-epoxy) | Glycidylaldehyde | 1-Propanol-2,3-epoxy | 228 | 191 | Diphenylamine | Benzenamine, N-phenyl- | 122-39-4 | |
| 191 | Halomethane, N.O.S 3 | Halomethane, N O.S 3 | Same | 229 | 192 | 1,2-Diphenylhydrazine | Hydrazine, 1,2-diphenyl- | 122-66-7 | U109 |
| 192 | Heptachlor (4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-) | Heptachlor | 4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro- | 230 | 193 | Di-n-propylnitrosamine | 1-Propanamine, N-nitroso-N-propyl- | 621-64-7 | U111 |
| 193 | Heptachlor epoxide (alpha, beta, and gamma isomers) (4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-2,3-epoxy-3a,4,7,7-tetrahydro-, alpha, beta, and gamma isomers) | Heptachlor epoxide (alpha, beta, and gamma isomers) | 4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-2,3-epoxy-3a,4,7,7-tetrahydro-, alpha, beta, and gamma isomers | 231 & 232 | 194 | **Disulfiram** | Thioperoxydicarbonic diamide, tetraethyl | 97-77-8 | |

| NRC Criterion 13 Hazardous Constituents (10 CFR 40, Appendix A) | | | | Equiv | EPA Hazardous Consituents (40 CFR 261, APPENDIX VIII) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NRC | *Promulgated by NRC circa 1987* | | | EPA | EPA | *Last Date of EPA Promulgation: 11/8/00* | | | |
| Order | Hazardous Constituent | Compound Names Parsed by DRC | | Order | Order | (verbatim listing) | | | |
| No. | (verbatim listing) | Chemical Name | Synonym | No | No. | Common name | Chemical abstracts name | CAS No. | HW No. |
| 194 | Hexachlorobenzene (Benzene, hexachloro-) | Hexachlorobenzene | Benzene, hexachloro- | 235 | 195 | Disulfoton | Phosphorodithioic acid, O,O-diethyl S-[2-(ethylthio)ethyl] ester | 298-04-4 | P039 |
| 195 | Hexachlorobutadiene (1,3-Butadiene, 1,1,2,3,4,4-hexachloro-) | Hexachlorobutadiene | 1,3-Butadiene, 1,1,2,3,4,4-hexachloro- | 236 | 196 | Dithiobiuret | Thioimidodicarbonic diamide [(H2 N)C(S)]2NH | 541-53-7 | P049 |
| 196 | Hexachlorocyclohexane (all isomers) (Lindane and isomers) | Lindane and isomers | Hexachlorocyclohexane (all isomers) | 261 | 197 | Endosulfan | 6,9-Methano-2,4,3-benzodioxathiepin,6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9ahexahydro-,3-oxide | 115-29-7 | P050 |
| 197 | Hexachlorocyclopentadiene (1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-) | Hexachlorocyclopentadiene | 1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro- | 237 | 198 | Endothall | 7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid | 145-73-3 | P088 |
| 198 | Hexachloroethane (Ethane, 1,1,1,2,2,2-hexachloro-) | Hexachloroethane | Ethane, 1,1,1,2,2,2-hexachloro- | 240 | 199 | Endrin | 2,7:3,6-Dimethanonaphth[2,3-b]oxirene,3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octa-hydro-,(1aalpha,2beta,2abeta,3alpha,6alpha,6abeta,7beta,7aalpha)- | 72-20-8 | P051 |
| 199 | 1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-hexahydro-1,4 5,8-endo,endo-dimethanonaphthalene (Hexachlorohexa-hydro-endo,endo-dimethanonaphthalene) | Isodrin | Hexachlorohexa-hydro-endo,endo-dimethanonaphthalene | 251 | 200 | Endrin metabolites | | | P051 |
| 200 | Hexachlorophene (2,2'-Methylenebis(3,4,6-trichlorophenol) | Hexachlorophene | 2,2'-Methylenebis(3,4,6-trichlorophenol | 241 | 201 | Epichlorohydrin | Oxirane, (chloromethyl)- | 106-89-8 | U041 |
| 201 | Hexachloropropene (1-Propene, 1,1,2,3,3,3-hexachloro-) | Hexachloropropene | 1-Propene, 1,1,2,3,3,3-hexachloro- | 242 | 202 | Epinephrine | 1,2-Benzenediol, 4-[1-hydroxy-2-(methylamino)ethyl]-, (R)- | 51-43-4 | P042 |
| 202 | Hexaethyl tetraphosphate (Tetraphosphoric acid, hexaethyl ester) | Hexaethyl tetraphosphate | Tetraphosphoric acid, hexaethyl ester | 243 | 203 | **EPTC** | Carbamothioic acid, dipropyl-, S-ethyl ester | 759-94-4 | |
| 203 | Hydrazine (Diamine) | Hydrazine | Diamine | 244 | 204 | Ethyl carbamate (urethane) | Carbamic acid, ethyl ester | 51-79-6 | U238 |
| 204 | Hydrocyanic acid (Hydrogen cyanide) | Hydrocyanic acid | Hydrogen cyanide | 245 | 205 | Ethyl cyanide | Propanenitrile | 107-12-0 | P101 |
| 205 | Hydrofluoric acid (Hydrogen fluoride) | Hydrofluoric acid | Hydrogen fluoride | 246 | 206 | **Ethyl Ziram** | Zinc, bis(diethylcarbamodithioato-S,S')- | 14324-55-1 | |

| NRC Criterion 13 Hazardous Constituents (10 CFR 40, Appendix A) | | | | Equiv. | EPA Hazardous Consituents (40 CFR 261, APPENDIX VIII) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NRC | *Promulgated by NRC circa 1987* | | | EPA | EPA | *Last Date of EPA Promulgation: 11/8/00* | | | |
| Order | Hazardous Constituent | Compound Names Parsed by DRC | | Order | Order | (verbatim listing) | | | |
| No. | (verbatim listing) | Chemical Name | Synonym | No | No. | Common name | Chemical abstracts name | CAS No. | HW No |
| 206 | Hydrogen sulfide (Sulfur hydride) | Hydrogen sulfide | Sulfur hydride | 247 | 207 | Ethylenebisdithiocarbamic acid | Carbamodithioic acid, 1,2-ethanediylbis- | 111-54-6 | U114 |
| 207 | Hydroxydimethylarsine oxide (Cacodylic acid) | Hydroxydimethylarsine oxide | Cacodylic acid | 62 | 208 | Ethylenebisdithiocarbamic acid, salts and esters | | | U114 |
| 208 | Indeno (1,2,3-cd)pyrene (1,10-(1,2-phenylene)pyrene) | Indeno (1,2,3-cd)pyrene | 1,10-(1,2-phenylene)pyrene | 248 | 209 | Ethylene dibromide | Ethane, 1,2-dibromo- | 106-93-4 | U067 |
| 209 | Iodomethane (Methyl iodide) | Iodomethane | Methyl iodide | 287 | 210 | Ethylene dichloride | Ethane, 1,2-dichloro- | 107-06-2 | U077 |
| 210 | ***Iron dextran (Ferric dextran)*** | ***Iron dextran*** | ***Ferric dextran*** | **N.C.** | 211 | **Ethylene glycol monoethyl ether** | Ethanol, 2-ethoxy- | 110-80-5 | U359 |
| 211 | Isocyanic acid, methyl ester (Methyl isocyanate) | Isocyanic acid | Methyl isocyanate | 288 | 212 | Ethyleneimine | Aziridine | 151-56-4 | P054 |
| 212 | Isobutyl alcohol (1-Propanol, 2-methyl-) | Isobutyl alcohol | 1-Propanol, 2-methyl- | 250 | 213 | Ethylene oxide | Oxirane | 75-21-8 | U115 |
| 213 | Isosafrole (Benzene, 1,2-methylenedioxy-4-allyl-) | Isosafrole | Benzene, 1,2-methylenedioxy-4-allyl- | 253 | 214 | Ethylenethiourea | 2-Imidazolidinethione | 96-45-7 | U116 |
| 214 | Kepone (Decachlorooctahydro-1,3,4-Methano-2H-cyclobuta[cd]pentalen-2-one) | Kepone | Decachlorooctahydro-1,3,4-Methano-2H-cyclobuta[cd]pentalen-2-one | 254 | 215 | Ethylidene dichloride | Ethane, 1,1-dichloro- | 75-34-3 | U076 |
| 215 | Lasiocarpine (2-Butenoic acid, 2-methyl-, 7-[(2,3-dihydroxy-2-(1-methoxyethyl)-3-methyl-1-oxobutoxy)methyl]-2,3,5,7a-tetrahydro-1H-pyrrolizin-1-yl ester) | Lasiocarpine | 2-Butenoic acid, 2-methyl-, 7-[(2,3-dihydroxy-2-(1-methoxyethyl)-3-methyl-1-oxobutoxy)methyl]-2,3,5,7a-tetrahydro-1H-pyrrolizin-1-yl ester | 255 | 216 | Ethyl methacrylate | 2-Propenoic acid, 2-methyl-, ethyl ester | 97-63-2 | U118 |
| 216 | Lead and compounds, N O.S 3 | Lead and compounds, N.O.S 3 | Same | 256 & 257 | 217 | Ethyl methanesulfonate | Methanesulfonic acid, ethyl ester | 62-50-0 | U119 |
| 217 | Lead acetate (Acetic acid, lead salt) | Lead acetate | Acetic acid, lead salt | 258 | 218 | Famphur | Phosphorothioic acid, O-[4-[(dimethylamino)sulfonyl]phenyl] O,O-dimethyl ester | 52-85-7 | P097 |
| 218 | Lead phosphate (Phosphoric acid, lead salt) | Lead phosphate | Phosphoric acid, lead salt | 259 | 219 | **Ferbam** | Iron, tris(dimethylcarbamodithioato-S,S')- | 14484-64-1 | |
| 219 | Lead subacetate (Lead, bis(acetato-0)tetrahydroxytri-) | Lead subacetate | Lead, bis(acetato-0)tetrahydroxytri- | 260 | 220 | Fluoranthene | Same | 206-44-0 | U120 |
| 220 | Maleic anhydride (2,5-Furandione) | Maleic anhydride | 2,5-Furandione | 262 | 221 | Fluorine | Same | 7782-41-4 | P056 |
| 221 | Maleic hydrazide (1,2-Dihydro-3,6-pyridazinedione) | Maleic hydrazide | 1,2-Dihydro-3,6-pyridazinedione | 263 | 222 | Fluoroacetamide | Acetamide, 2-fluoro- | 640-19-7 | P057 |
| 222 | Malononitrile (Propanedinitrile) | Malononitrile | Propanedinitrile | 264 | 223 | Fluoroacetic acid, sodium salt | Acetic acid, fluoro-, sodium salt | 62-74-8 | P058 |

| NRC Criterion 13 Hazardous Constituents (10 CFR 40, Appendix A) | | | | Equiv. | EPA Hazardous Consituents (40 CFR 261, APPENDIX VIII) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NRC | *Promulgated by NRC circa 1987* | | | EPA | EPA | *Last Date of EPA Promulgation: 11/8/00* | | | |
| Order | Hazardous Constituent | Compound Names Parsed by DRC | | Order | Order | (verbatim listing) | | | |
| No. | (verbatim listing) | Chemical Name | Synonym | No | No. | Common name | Chemical abstracts name | CAS No | HW No. |
| 223 | Melphalan (Alanine, 3-[p-bis(2-chloroethyl)amino]phenyl-,L-) | Melphalan | Alanine, 3-[p-bis(2-chloroethyl)amino]phenyl-,L- | 266 | 224 | Formaldehyde | Same | 50-00-0 | U122 |
| 224 | Mercury fulminate (Fulminic acid, mercury salt) | Mercury fulminate | Fulminic acid, mercury salt | 269 | 225 | **Formetanate hydrochloride** | Methanimidamide, N,N-dimethyl-N'-[3-[[(methylamino) carbonyl]oxy]phenyl]-,monohydrochloride | 23422-53-9 | P198 |
| 225 | Mercury and compounds, N O.S.3 | Mercury and compounds, N.O.S.3 | Same | 267 & 268 | 226 | Formic acid | Same | 64-18-6 | U123 |
| 226 | Methacrylonitrile (2-Propenenitrile, 2-methyl-) | Methacrylonitrile | 2-Propenenitrile, 2-methyl- | 271 | 227 | **Formparanate** | Methanimidamide, N,N-dimethyl-N¢-[2-methyl-4-[[(methylamino) carbonyl]oxy]phenyl]- | 17702-57-7 | P197 |
| 227 | Methanethiol (Thiomethanol) | Methanethiol | Thiomethanol | 437 | 228 | Glycidylaldehyde | Oxiranecarboxyaldehyde | 765-34-4 | U126 |
| 228 | Methapyrilene (Pyridine. 2-[(2-dimethylamino)ethyl]-2-thenylamino-) | Methapyrilene | Pyridine 2-[(2-dimethylamino- | 272 | 229 | Halomethanes, N O.S 1 | | | |
| 229 | Metholmyl (Acetimidic acid, N-[(methylcarbamoyl)oxy]thio-, methyl ester) | Metholmyl | Acetimidic acid, N-[(methylcarbamoyl)oxy]thio-, methyl ester | 274 | 230 | Heptachlor | 4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro- | 76-44-8 | P059 |
| 230 | Methoxychlor (Ethane, 1,1,1-trichloro-2,2-bis(p-methoxyphenyl)-) | Methoxychlor | Ethane, 1,1,1-trichloro-2,2-bis(p-methoxyphenyl)- | 275 | 231 | Heptachlor epoxide | 2,5-Methano-2H-indeno[1,2-b]oxirene,2,3,4,5,6,7,7-heptachloro-1a,1b,5,5a,6,6ahexa-hydro-,(1aalpha,1bbeta,2alpha,5alpha, 5abeta,6beta,6aalpha)- | 1024-57-3 | |
| 231 | 2-Methylaziridine (1,2-Propylenimine) | 2-Methylaziridine | 1,2-Propylenimine | 380 | 232 | Heptachlor epoxide (alpha, beta, and gamma isomers) | | | |
| 232 | 3-Methylcholanthrene (Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-) | 3-Methylcholanthrene | Benz[j]aceanthrylene, 1,2-dihydro-3-methyl- | 280 | 233 | **Heptachlorodibenzofurans** | | | |
| 233 | Methyl chlorocarbonate (Carbonochloridic acid, methyl ester) | Methyl chlorocarbonate | Carbonochloridic acid, methyl ester | 278 | 234 | **Heptachlorodibenzo-p-dioxins** | | | |
| 234 | 4,4-Methylenebis(2-chloroaniline) (Benzenamine, 4,4 methylenebis- (2-chloro-) | 4,4-Methylenebis(2-chloroaniline) | Benzenamine, 4,4-methylenebis-(2-chloro- | 281 | 235 | Hexachlorobenzene | Benzene, hexachloro- | 118-74-1 | U127 |
| 235 | Methyl ethyl ketone (MEK) (2-Butanone) | Methyl ethyl ketone (MEK) | 2-Butanone | 284 | 236 | Hexachlorobutadiene | 1,3-Butadiene, 1,1,2,3,4,4-hexachloro- | 87-68-3 | U128 |
| 236 | Methyl hydrazine (Hydrazine, methyl-) | Methyl hydrazine | Hydrazine, methyl- | 286 | 237 | Hexachlorocyclopentadiene | 1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro- | 77-47-4 | U130 |
| 237 | 2-Methyllactonitrile (Propanenitrile, 2-hydroxy-2-methyl-) | 2-Methyllactonitrile | Propanenitrile, 2-hydroxy-2-methyl- | 289 | 238 | **Hexachlorodibenzo-p-dioxins** | | | |

| NRC Criterion 13 Hazardous Constituents (10 CFR 40, Appendix A) | | | | Equiv. | EPA Hazardous Consituents (40 CFR 261, APPENDIX VIII) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NRC | *Promulgated by NRC circa 1987* | | | EPA | EPA | *Last Date of EPA Promulgation: 11/8/00* | | | |
| Order | Hazardous Constituent | Compound Names Parsed by DRC | | Order | Order | (verbatim listing) | | | |
| No. | (verbatim listing) | Chemical Name | Synonym | No. | No | Common name | Chemical abstracts name | CAS No. | HW No. |
| 238 | Methyl methacrylate (2-Propenoic acid, 2-methyl-, methyl ester) | Methyl methacrylate | 2-Propenoic acid, 2-methyl-, methyl ester | 290 | 239 | **Hexachlorodibenzofurans** | | | |
| 239 | Methyl methanesulfonate (Methanesulfonic acid, methyl ester) | Methyl methanesulfonate | Methanesulfonic acid, methyl ester | 291 | 240 | Hexachloroethane | Ethane, hexachloro- | 67-72-1 | U131 |
| 240 | 2-Methyl-2-(methylthio)propionaldehyde-o-(methylcarbonyl) oxime (Propanal, 2-methyl-2-(methylthio)-, 0-[(methylamino)carbonyl]oxime) | 2-Methyl-2-(methylthio)propionaldehyde-o-(methylcarbonyl) oxime | Propanal, 2-methyl-2-(methylthio)-, 0-[(methylamino)carbonyl]oxime | 11 | 241 | Hexachlorophene | Phenol, 2,2'-methylenebis[3,4,6-trichloro- | 70-30-4 | U132 |
| 241 | N-Methyl-N-nitro-N-nitrosoguanidine (Guanidine, N-nitroso-N-methyl-N- nitro-) | N-Methyl-N-nitro-N-nitrosoguanidine | Guanidine, N-nitroso-N-methyl-N nitro- | 297 | 242 | Hexachloropropene | 1-Propene, 1,1,2,3,3,3-hexachloro- | 1888-71-7 | U243 |
| 242 | Methyl parathion (0,0-dimethyl 0-(4-nitrophenyl) phosphorothioate) | Methyl parathion | 0,0-dimethyl 0-(4-nitrophenyl) phosphorothioate | 292 | 243 | Hexaethyl tetraphosphate | Tetraphosphoric acid, hexaethyl ester | 757-58-4 | P062 |
| 243 | Methylthiouracil (4-IH-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-) | Methylthiouracil | 4-IH-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo- | 293 | 244 | Hydrazine | Same | 302-01-2 | U133 |
| 244 | ***Molybdenum and compounds, N.O.S.3*** | ***Molybdenum and compounds, N.O.S.3*** | ***Same*** | N.C. | 245 | Hydrogen cyanide | Hydrocyanic acid | 74-90-8 | P063 |
| 245 | Mustard gas (Sulfide, bis(2-chloroethyl)-) | Mustard gas | Sulfide, bis(2-chloroethyl | 299 | 246 | Hydrogen fluoride | Hydrofluoric acid | 7664-39-3 | U134 |
| 246 | Naphthalene | Naphthalene | Same | 300 | 247 | Hydrogen sulfide | Hydrogen sulfide H2S | 7783-06-4 | U135 |
| 247 | 1,4-Naphthoquinone (1,4-Naphthalenedione) | 1,4-Naphthoquinone | 1,4-Naphthalenedione | 301 | 248 | Indeno[1,2,3-cd]pyrene | Same | 193-39-5 | U137 |
| 248 | 1-Naphthylamine (alpha-Naphthylamine) | 1-Naphthylamine | alpha-Naphthylamine | 302 | 249 | **3-Iodo-2-propynyl n-butylcarbamate** | Carbamic acid, butyl-, 3-iodo-2-propynyl ester | 55406-53-6 | |
| 249 | 2-Naphthylamine (beta-Naphthylamine) | 2-Naphthylamine | beta-Naphthylamine | 303 | 250 | Isobutyl alcohol | 1-Propanol, 2-methyl- | 78-83-1 | U140 |
| 250 | 1-Naphthyl-2-thiourea (Thiourea, 1-naphthalenyl-) | 1-Naphthyl-2-thiourea | Thiourea, 1-naphthalenyl- | 304 | 251 | Isodrin | 1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-,(1alpha,4alpha,4abeta,5beta,8beta,8abeta)- | 465-73-6 | P060 |
| 251 | Nickel and compounds, N.O.S 3 | Nickel and compounds, N.O.S 3 | Same | 305 & 306 | 252 | **Isolan** | Carbamic acid, dimethyl-, 3-methyl-1-(1-methylethyl)-1H-pyrazol-5-yl ester | 119-38-0 | P192 |
| 252 | Nickel carbonyl (Nickel tetracarbonyl) | Nickel carbonly | Nickel tetracarbonyl | 307 | 253 | Isosafrole | 1,3-Benzodioxole, 5-(1-propenyl) | 120-58-1 | U141 |

| NRC Criterion 13 Hazardous Constituents (10 CFR 40, Appendix A) | | | | Equiv. | EPA Hazardous Consituents (40 CFR 261, APPENDIX VIII) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NRC | *Promulgated by NRC circa 1987* | | | EPA | EPA | *Last Date of EPA Promulgation: 11/8/00* | | | |
| Order | Hazardous Constituent | Compound Names Parsed by DRC | | Order | Order | (verbatim listing) | | | |
| No. | (verbatim listing) | Chemical Name | Synonym | No | No. | Common name | Chemical abstracts name | CAS No. | HW No |
| 253 | Nickel cyanide (Nickel (II) cyanide) | Nickel cyanide | Nickel (II) cyanide | 308 | 254 | Kepone | 1,3,4-Metheno-2H-cyclobuta[cd]pentalen-2-one, 1,1a,3,3a,4,5,5,5a,5b,6-decachlorooctahydro- | 143-50-0 | U142 |
| 254 | Nicotine and salts (Pyridine, (S)-3-(1-methyl-2-pyrrolidinyl)-, and salts) | Nicotine and salts | Pyridine, (S)-3-(1-methyl-2-pyrrolidinyl)-, and salts | 309 & 310 | 255 | Lasiocarpine | 2-Butenoic acid, 2-methyl-,7-[[2,3-dihydroxy-2-(1-methoxyethyl)-3-methyl-1-oxobutoxy]methyl]-2,3,5,7a-tetrahydro-1Hpyrrolizin-1-yl ester,[1S-[1alpha(Z),7(2S*,3R*),7aalpha]]- | 303-34-1 | 4143 |
| 255 | Nitric oxide (Nitrogen (II) oxide) | Nitric oxide | Nitrogen (II) oxide | 311 | 256 | Lead | Same | 7439-92-1 | |
| 256 | p-Nitroaniline (Benzenamine, 4-nitro-) | p-Nitroaniline | Benzenamine, 4-nitro- | 312 | 257 | Lead compounds, N.O.S.1 | | | |
| 257 | Nitrobenzine (Benzene, nitro-) | Nitrobenzine | Benzene, nitro- | 313 | 258 | Lead acetate | Acetic acid, lead(2+) salt | 301-04-2 | U144 |
| 258 | Nitrogen dioxide (Nitrogen (IV) oxide) | Nitrogen dioxide | Nitrogen (IV) oxide | 314 | 259 | Lead phosphate | Phosphoric acid, lead(2+) salt (2:3) | 7446-27-7 | U145 |
| 259 | Nitrogen mustard and hydrochloride salt (Ethanamine, 2-chloro-, N-(2-chloroethyl)- N-methyl-, and hydrochloride salt) | Nitrogen mustard and hydrochloride salt | Ethanamine, 2-chloro-, N-(2-chloroethyl)- N-methyl-, and hydrochloride salt | 315 & 316 | 260 | Lead subacetate | Lead, bis(acetato-O)tetrahydroxytri- | 1335-32-6 | U146 |
| 260 | Nitrogen mustard N-Oxide and hydrochloride salt (Ethanamine, 2-chloro-, N-(2-chloroethyl)-N-methyl-, and hydrochloride salt) | Nitrogen mustard N-Oxide and hydrochloride salt | Ethanamine, 2-chloro-, N-(2-chloroethyl)-N-methyl-, and hydrochloride salt | 317 & 318 | 261 | Lindane | Cyclohexane, 1,2,3,4,5,6-hexachloro-,(1alpha,2alpha,3beta,4alpha,5alpha,6beta)- | 58-89-9 | U129 |
| 261 | Nitroglycerine (1,2,3-Propanetriol, trinitrate) | Nitroglycerine | 1,2,3-Propanetriol, trinitrate | 319 | 262 | Maleic anhydride | 2,5-Furandione | 108-31-6 | U147 |
| 262 | 4-Nitrophenol (Phenol, 4-nitro-) | 4-Nitrophenol | Phenol, 4-nitro- | 320 | 263 | Maleic hydrazide | 3,6-Pyridazinedione, 1,2-dihydro- | 123-33-1 | U148 |
| 263 | **4-Nitroquinoline-1-oxide (Quinoline, 4-nitro-1-oxide-)** | **4-Nitroquinoline-1-oxide** | **Quinoline, 4-nitro-1-oxide-** | **N.C.** | 264 | Malononitrile | Propanedinitrile | 109-77-3 | U149 |
| 264 | Nitrosamine, N O.S.3 | Nitrosamine, N.O.S.3 | Same | 322 | 265 | **Manganese dimethyldithiocarbamate** | Manganese, bis(dimethylcarbamodithioato-S,S')-, | 15339-36-3 | P196 |
| 265 | N-Nitrosodi-n-butylamine (1-Butanamine, N-butyl-N-nitroso-) | N-Nitrosodi-n-butylamine | 1-Butanamine, N-butyl-N-nitroso- | 323 | 266 | Melphalan | L-Phenylalanine, 4-[bis(2-chloroethyl)amino]- | 148-82-3 | U150 |

| NRC Criterion 13 Hazardous Constituents (10 CFR 40, Appendix A) | | | | Equiv. | EPA Hazardous Consituents (40 CFR 261, APPENDIX VIII) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NRC | *Promulgated by NRC circa 1987* | | | EPA | EPA | *Last Date of EPA Promulgation: 11/8/00* | | | |
| Order | Hazardous Constituent | Compound Names Parsed by DRC | | Order | Order | (verbatim listing) | | | |
| No. | (verbatim listing) | Chemical Name | Synonym | No | No. | Common name | Chemical abstracts name | CAS No. | HW No. |
| 266 | N-Nitrosodiethanolamine (Ethanol, 2,2-(nitrosoimino)bis-) | N-Nitrosodiethanolamine | Ethanol, 2,2-(nitrosoimino)bis- | 324 | 267 | Mercury | Same | 7439-97-6 | U151 |
| 267 | N-Nitrosodiethylamine (Ethanamine, N-ethyl-N-nitroso-) | N-Nitrosodiethylamine | Ethanamine, N-ethyl-N-nitroso- | 325 | 268 | Mercury compounds, N.O.S.1 | | | |
| 268 | N-Nitrosodimethylamine (Dimethylnitrosamine) | N-Nitrosodimethylamine | Dimethylnitrosamine | 326 | 269 | Mercury fulminate | Fulminic acid, mercury(2+) salt | 628-86-4 | P065 |
| 269 | N-Nitroso-N-ethylurea (Carbamide, N-ethyl-N-nitroso-) | N-Nitroso-N-ethylurea | Carbamide, N-ethyl-N-nitroso- | 327 | 270 | Metam Sodium | Carbamodithioic acid, methyl-, monosodium salt | 137-42-8 | |
| 270 | N-Nitrosomethylethylamine (Ethanamine, N-methyl-N-nitroso-) | N-Nitrosomethylethylamine | Ethanamine, N-methyl-N-nitroso- | 328 | 271 | Methacrylonitrile | 2-Propenenitrile, 2-methyl- | 126-98-7 | U152 |
| 271 | N-Nitroso-N-methylurea (Carbamide, N-methyl-N-nitroso-) | N-Nitroso-N-methylurea | Carbamide, N-methyl-N-nitroso- | 329 | 272 | Methapyrilene | 1,2-Ethanediamine, N,N-dimethyl-N¢-2-pyridinyl-N¢-(2-thienylmethyl)- | 91-80-5 | U155 |
| 272 | N-Nitroso-N-methylurethane (Carbamic acid, methylnitroso-, ethyl ester) | N-Nitroso-N-methylurethane | Carbamic acid, methylnitroso-, ethyl ester | 330 | 273 | Methiocarb | Phenol, (3,5-dimethyl-4-(methylthio)-, methylcarbamate | 2032-65-7 | P199 |
| 273 | N-Nitrosomethylvinylamine (Ethenamine, N-methyl-N-nitroso-) | N-Nitrosomethylvinylamine | Ethenamine, N-methyl-N-nitroso- | 331 | 274 | Methomyl | Ethanimidothioic acid, N-[[(methylamino)carbonyl]oxy]-, methyl ester | 16752-77-5 | P066 |
| 274 | N-Nitrosomorpholine (Morpholine, N-nitroso-) | N-Nitrosomorpholine | Morpholine, N-nitroso- | 332 | 275 | Methoxychlor | Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4-methoxy- | 72-43-5 | U247 |
| 275 | N-Nitrosonornicotine (Nornicotine, N-nitroso-) | N-Nitrosonornicotine | Nornicotine, N-nitroso- | 333 | 276 | Methyl bromide | Methane, bromo- | 74-83-9 | U029 |
| 276 | N-Nitrosopiperidine (Pyridine, hexahydro-, N-nitroso-) | N-Nitrosopiperidine | Pyridine, hexahydro-, N-nitroso- | 334 | 277 | Methyl chloride | Methane, chloro- | 74-87-3 | U045 |
| 277 | Nitrosopyrrolidine (Pyrrole, tetrahydro-, N-nitroso-) | Nitrosopyrrolidine | Pyrrole, tetrahydro-, N-nitroso- | 335 | 278 | Methyl chlorocarbonate | Carbonochloridic acid, methyl ester | 79-22-1 | U156 |
| 278 | N-Nitrososarcosine (Sarcosine, N-nitroso-) | N-Nitrososarcosine | Sarcosine, N-nitroso- | 336 | 279 | Methyl chloroform | Ethane, 1,1,1-trichloro- | 71-55-6 | U226 |
| 279 | 5-Nitro-o-toluidine (Benzenamine, 2-methyl-5-nitro-) | 5-Nitro-o-toluidine | Benzenamine, 2-methyl-5-nitro- | 337 | 280 | 3-Methylcholanthrene | Benz[j]aceanthrylene, 1,2-dihydro-3-methyl- | 56-49-5 | U157 |
| 280 | Octamethylpyrophosphoramide (Diphosphoramide, octamethyl-) | Octamethylpyrophosphoramide | Diphosphoramide, octamethyl- | 340 | 281 | 4,4'-Methylenebis(2-chloroaniline) | Benzenamine, 4,4'-methylenebis[2-chloro- | 101-14-4 | U158 |
| 281 | Osmium tetroxide (Osmium (VIII) oxide) | Osmium tetroxide | Osmium (VIII) oxide | 341 | 282 | Methylene bromide | Methane, dibromo- | 74-95-3 | U068 |
| 282 | 7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid (Endothal) | Endothall | 7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid | 198 | 283 | Methylene chloride | Methane, dichloro- | 75-09-2 | U080 |

| NRC Criterion 13 Hazardous Constituents (10 CFR 40, Appendix A) | | | | Equiv. |
|---|---|---|---|---|
| NRC | *Promulgated by NRC circa 1987* | | | EPA |
| Order | Hazardous Constituent | Compound Names Parsed by DRC | | Order |
| No. | (verbatim listing) | Chemical Name | Synonym | No |
| 283 | Paraldehyde (1,3,5-Trioxane, 2,4,6-trimethyl-) | Paraldehyde | 1,3,5-Trioxane, 2,4,6-trimethyl- | 343 |
| 284 | Parathion (Phosphorothioic acid, O,O-diethyl O-(p-nitrophenyl)ester) | Parathion | Phosphorothioic acid, O,O-diethyl O-(p-nitrophenyl)ester | 344 |
| 285 | Pentachlorobenzene (Benzene, pentachloro-) | Pentachlorobenzene | Benzene, pentachloro- | 346 |
| 286 | Pentachloroethane (Ethane, pentachloro-) | Pentachloroethane | Ethane, pentachloro- | 349 |
| 287 | Pentachloronitrobenzene (PCNB) (Benzene, pentachloronitro-) | Pentachloronitrobenzene | Benzene, pentachloronitro- | 350 |
| 288 | Pentachlorophenol (Phenol, pentachloro-) | Pentachlorophenol | Phenol, pentachloro- | 351 |
| 289 | Phenacetin (Acetamide, N-(4-ethoxyphenyl)-) | Phenacetin | Acetamide, N-(4-ethoxyphenyl)- | 352 |
| 290 | Phenol (Benzene, hydroxy-) | Phenol | Benzene, hydroxy- | 353 |
| 291 | Phenylenediamine (Benzenediamine) | Phenylenediamine | Benzenediamine | 354 |
| 292 | Phenylmercury acetate (Mercury, acetatophenyl-) | Phenylmercury acetate | Mercury, acetatophenyl- | 355 |
| 293 | N-Phenylthiourea (Thiourea, phenyl-) | N-Phenylthiourea | Thiourea, phenyl- | 356 |
| 294 | Phosgene (Carbonyl chloride) | Phosgene | Carbonyl chloride | 357 |
| 295 | Phosphine (Hydrogen phosphide) | Phosphine | Hydrogen phosphide | 358 |
| 296 | Phosphorodithioic acid, O,O-diethyl S-[(ethylthio)methyl] ester (Phorate) | Phorate | Phosphorodithioic acid, O,O-diethyl S-[(ethylthio)methyl] ester | 359 |
| 297 | Phosphorothioic acid, O,O-dimethyl O-[p-((dimethylamino)sulfonyl)phenyl] ester (Famphur) | Famphur | Phosphorothioic acid, O,O-dimethyl O-[p-((dimethylamino)sulfonyl)phenyl] ester | 218 |
| 298 | Phthalic acid esters, N.O S.3 (Benzene, 1,2-dicarboxylic acid, esters, N.O.S 3) | Phthalic acid esters, N.O.S. 3 | Benzene, 1,2-dicarboxylic acid, esters, N O S 3 | 360 |

| EPA Hazardous Consituents (40 CFR 261, APPENDIX VIII) | | | | |
|---|---|---|---|---|
| EPA | *Last Date of EPA Promulgation: 11/8/00* | | | |
| Order | (verbatim listing) | | | |
| No. | Common name | Chemical abstracts name | CAS No | HW No |
| 284 | Methyl ethyl ketone (MEK) | 2-Butanone | 78-93-3 | U159 |
| 285 | Methyl ethyl ketone peroxide | 2-Butanone, peroxide | 1338-23-4 | U160 |
| 286 | Methyl hydrazine | Hydrazine, methyl- | 60-34-4 | P068 |
| 287 | Methyl iodide | Methane, iodo- | 74-88-4 | U138 |
| 288 | Methyl isocyanate | Methane, isocyanato- | 624-83-9 | P064 |
| 289 | 2-Methyllactonitrile | Propanenitrile, 2-hydroxy-2-methyl- | 75-86-5 | P069 |
| 290 | Methyl methacrylate | 2-Propenoic acid, 2-methyl-, methyl ester | 80-62-6 | U162 |
| 291 | Methyl methanesulfonate | Methanesulfonic acid, methyl ester | 66-27-3 | |
| 292 | Methyl parathion | Phosphorothioic acid, O,O-dimethyl O-(4-nitrophenyl) ester | 298-00-0 | P071 |
| 293 | Methylthiouracil | 4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo- | 56-04-2 | U164 |
| 294 | **Metolcarb** | Carbamic acid, methyl-, 3-methylphenyl ester | 1129-41-5 | P190 |
| 295 | **Mexacarbate** | Phenol, 4-(dimethylamino)-3,5-dimethyl-,methylcarbamate (ester) | 315-18-4 | P128 |
| 296 | Mitomycin C | Azirino[2',3':3,4]pyrrolo[1,2-a]indole-4,7-dione, 6-amino-8-[[(aminocarbonyl)oxy]methyl]-1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5- methyl-, [1aS-(1aalpha,8beta,8aalpha,8balpha)]- | 50-07-7 | U010 |
| 297 | MNNG | Guanidine, N-methyl-N'-nitro-N-nitroso- | 70-25-7 | U163 |
| 298 | **Molinate** | 1H-Azepine-1-carbothioic acid, hexahydro-, S-ethyl ester | 2212-67-1 | |
| 299 | Mustard gas | Ethane, 1,1'-thiobis[2-chloro- | 505-60-2 | |

| NRC Criterion 13 Hazardous Constituents (10 CFR 40, Appendix A) | | | | Equiv. | EPA Hazardous Consituents (40 CFR 261, APPENDIX VIII) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NRC | *Promulgated by NRC circa 1987* | | | EPA | EPA | *Last Date of EPA Promulgation: 11/8/00* | | | |
| Order | Hazardous Constituent | Compound Names Parsed by DRC | | Order | Order | (verbatim listing) | | | |
| No. | (verbatim listing) | Chemical Name | Synonym | No | No. | Common name | Chemical abstracts name | CAS No. | HW No |
| 299 | Phthalic anhydride (1,2-Benzenedicarboxylic acid anhydride) | Phthalic anhydride | 1,2-Benzenedicarboxylic acid anhydride | 361 | 300 | Naphthalene | Same | 91-20-3 | U165 |
| 300 | 2-Picoline (Pyridine, 2-methyl-) | 2-Picoline | Pyridine, 2-methyl- | 364 | 301 | 1,4-Naphthoquinone | 1,4-Naphthalenedione | 130-15-4 | U166 |
| 301 | Polychlorinated biphenyl, N O.S 3 | Polychlorinated biphenyl, N.O.S 3 | Same | 365 | 302 | alpha-Naphthylamine | 1-Naphthalenamine | 134-32-7 | U167 |
| 302 | Potassium cyanide | Potassium cyanide | Same | 366 | 303 | beta-Naphthylamine | 2-Naphthalenamine | 91-59-8 | U168 |
| 303 | Potassium silver cyanide (Argentate(1-), dicyano-, potassium) | Potassium silver cyanide | Argentate(1-), dicyano-, potassium | 371 | 304 | alpha-Naphthylthiourea | Thiourea, 1-naphthalenyl- | 86-88-4 | P072 |
| 304 | Pronamide (3,5-Dichloro-N-(1,1-dimethyl-2-propynyl)benzamide) | Pronamide | 3,5-Dichloro-N-(1,1-dimethyl-2-propynyl)benzamide | 373 | 305 | Nickel | Same | 7440-02-0 | |
| 305 | 1,3-Propane sultone (1,2-Oxathiolane, 2,2-dioxide) | 1,3-Propane sultone | 1,2-Oxathiolane, 2,2-dioxide | 374 | 306 | Nickel compounds, N.O S.1 | | | |
| 306 | n-Propylamine (1-Propanamine) | n-Propylamine | 1-Propanamine | 375 | 307 | Nickel carbonyl | Nickel carbonyl Ni(CO)4, (T-4)- | 13463-39-3 | P073 |
| 307 | Propylthiouracil (Undecamethylenediamine, N,N'-bis(2-chlorobenzyl-), dihydrochloride) | Propylthiouracil | Undecamethylenediamine, N,N'-bis(2-chlorobenzyl-), dihydrochloride | 381 | 308 | Nickel cyanide | Nickel cyanide Ni(CN)2 | 557-19-7 | P074 |
| 308 | 2-Propyn-1-ol (Propargyl alcohol) | Propargyl alcohol | 2-Propyn-1-ol | 376 | 309 | Nicotine | Pyridine, 3-(1-methyl-2-pyrrolidinyl)-, (S)- | 54-11-5 | P075 |
| 309 | Pyridine | Pyridine | Same | 383 | 310 | Nicotine salts | | | P075 |
| 310 | **Radium -226 and -228** | **Radium -226 and -228** | **Same** | **N.C.** | 311 | Nitric oxide | Nitrogen oxide NO | 10102-43-9 | P076 |
| 311 | Reserpine (Yohimban-16-carboxylic acid, 11,17-dimethoxy 18-[3,4,5-trimethoxybenzoyl)oxy]-, methyl ester) | Reserpine | Yohimban-16-carboxylic acid, 11,17-dimethoxy-18-[3,4,5-trimethoxybenzoyl)oxy]-, methyl ester | 384 | 312 | p-Nitroaniline | Benzenamine, 4-nitro- | 100-01-6 | P077 |
| 312 | Resorcinol (1,3-Benzenediol) | Resorcinol | 1,3-Benzenediol | 385 | 313 | Nitrobenzene | Benzene, nitro- | 98-95-3 | U169 |
| 313 | Saccharin and salts (1,2-Benzoisothiazolin-3-one, 1,1-dioxide, and salts) | Saccharin and salts | 1,2-Benzoisothiazolin-3-one, 1,1-dioxide, and salts | 386 & 387 | 314 | Nitrogen dioxide | Nitrogen oxide NO2 | 10102-44-0 | P078 |
| 314 | Safrole (Benzene, 1,2-methylenedioxy-4-allyl-) | Safrole | Benzene, 1,2-methylenedioxy-4-allyl- | 388 | 315 | Nitrogen mustard | Ethanamine, 2-chloro-N-(2-chloroethyl)-N-methyl- | 51-75-2 | |
| 315 | Selenious acid (Selenium dioxide) | Selenious acid | Selenium dioxide | 391 | 316 | Nitrogen mustard, hydrochloride salt | | | |
| 316 | Selenium and compounds, N.O.S.3 | Selenium and compounds, N.O.S.3 | Same | 389 & 390 | 317 | Nitrogen mustard N-oxide | Ethanamine, 2-chloro-N-(2-chloroethyl)-N-methyl-, N-oxide. | 126-85-2 | |
| 317 | Selenium sulfide (Sulfur selenide) | Selenium sulfide | Sulfur selenide | 392 | 318 | Nitrogen mustard, N-oxide, hydro- chloride salt | | | |

| NRC Criterion 13 Hazardous Constituents (10 CFR 40, Appendix A) | | | | Equiv. | EPA Hazardous Consituents (40 CFR 261, APPENDIX VIII) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NRC | *Promulgated by NRC circa 1987* | | | EPA | EPA | *Last Date of EPA Promulgation: 11/8/00* | | | |
| Order | Hazardous Constituent | Compound Names Parsed by DRC | | Order | Order | (verbatim listing) | | | |
| No. | (verbatim listing) | Chemical Name | Synonym | No | No. | Common name | Chemical abstracts name | CAS No. | HW No |
| 318 | Selenourea (Carbamimidoselenoic acid) | Selenourea | Carbamimidoselenoic acid | 394 | 319 | Nitroglycerin | 1,2,3-Propanetriol, trinitrate | 55-63-0 | P081 |
| 319 | Silver and compounds, N O S 3 | Silver and compounds, N O S 3 | Same | 395 & 396 | 320 | p-Nitrophenol | Phenol, 4-nitro- | 100-02-7 | U170 |
| 320 | Silver cyanide | Silver cyanide | Same | 397 | 321 | 2-Nitropropane | Propane, 2-nitro- | 79-46-9 | U171 |
| 321 | Sodium cyanide | Sodium cyanide | Same | 399 | 322 | Nitrosamines, N O.S.1 | | 35576-91-1D | |
| 322 | Streptozotocin (D-Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)-) | Streptozotocin | D-Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)- | 404 | 323 | N-Nitrosodi-n-butylamine | 1-Butanamine, N-butyl-N-nitroso- | 924-16-3 | U172 |
| 323 | **Strontium sulfide** | **Strontium sulfide** | **Same** | **N.C.** | 324 | N-Nitrosodiethanolamine | Ethanol, 2,2'-(nitrosoimino)bis- | 1116-54-7 | U173 |
| 324 | Strychnine and salts (Strychnidin 10-one, and salts) | Strychnine and salts | Strychnidin-10-one, and salts | 405 & 406 | 325 | N-Nitrosodiethylamine | Ethanamine, N-ethyl-N-nitroso- | 55-18-5 | U174 |
| 325 | 1,2,4,5-Tetrachlorobenzene (Benzene, 1,2,4,5-tetrachloro-) | 1,2,4,5-Tetrachlorobenzene | Benzene, 1,2,4,5-tetrachloro- | 410 | 326 | N-Nitrosodimethylamine | Methanamine, N-methyl-N-nitroso- | 62-75-9 | P082 |
| 326 | 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) (Dibenzo-p-dioxin, 2,3,7,8-tetrachloro-) | 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) | Dibenzo-p-dioxin, 2,3,7,8-tetrachloro- | 408 & 411 | 327 | N-Nitroso-N-ethylurea | Urea, N-ethyl-N-nitroso- | 759-73-9 | U176 |
| 327 | Tetrachloroethane, N.O.S 3 (Ethane, tetrachloro-, N O.S.3) | Tetrachloroethane, N.O.S 3 | Ethane, tetrachloro-, N O.S.3 | 413 | 328 | N-Nitrosomethylethylamine | Ethanamine, N-methyl-N-nitroso- | 10595-95-6 | |
| 328 | 1,1,1,2-Tetrachlorethane (Ethane, 1,1,1,2-tetrachloro-) | 1,1,1,2-Tetrachlorethane | Ethane, 1,1,1,2-tetrachloro- | 414 | 329 | N-Nitroso-N-methylurea | Urea, N-methyl-N-nitroso- | 684-93-5 | U177 |
| 329 | 1,1,2,2-Tetrachlorethane (Ethane, 1,1,2,2-tetrachloro-) | 1,1,2,2-Tetrachlorethane | Ethane, 1,1,2,2-tetrachloro- | 415 | 330 | N-Nitroso-N-methylurethane | Carbamic acid, methylnitroso-, ethyl ester | 615-53-2 | U178 |
| 330 | Tetrachloroethane (Ethene, 1,1,2,2-tetrachloro-) | Tetrachloroethane | Ethene, 1,1,2,2-tetrachloro- | 415 | 331 | N-Nitrosomethylvinylamine | Vinylamine, N-methyl-N-nitroso- | 4549-40-0 | P084 |
| 331 | Tetrachloromethane (Carbon tetrachloride) | Tetrachloromethane | Carbon tetrachloride | 73 | 332 | N-Nitrosomorpholine | Morpholine, 4-nitroso- | 59-89-2 | |
| 332 | 2,3,4,6,-Tetrachlorophenol (Phenol, 2,3,4,6-tetrachloro-) | 2,3,4,6,-Tetrachlorophenol | Phenol, 2,3,4,6-tetrachloro- | 417 | 333 | N-Nitrosonornicotine | Pyridine, 3-(1-nitroso-2-pyrrolidinyl)-, (S)- | 16543-55-8 | |
| 333 | Tetraethyldithiopyrophosphate (Dithiopyrophosphoric acid, tetraethyl-ester) | Tetraethyldithiopyrophosphate | Dithiopyrophosphoric acid, tetraethyl-ester | 420 | 334 | N-Nitrosopiperidine | Piperidine, 1-nitroso- | 100-75-4 | U179 |
| 334 | Tetraethyl lead (Plumbane, tetraethyl-) | Tetraethyl lead | Plumbane, tetraethyl- | 421 | 335 | N-Nitrosopyrrolidine | Pyrrolidine, 1-nitroso- | 930-55-2 | U180 |
| 335 | Tetraethylpyrophosphate (Pyrophosphoric acide, tetraethyl ester) | Tetraethylpyrophosphate | Pyrophosphoric acide, tetraethyl ester | 422 | 336 | N-Nitrososarcosine | Glycine, N-methyl-N-nitroso- | 13256-22-9 | .... |
| 336 | Tetranitromethane (Methane, tetranitro-) | Tetranitromethane | Methane, tetranitro- | 424 | 337 | 5-Nitro-o-toluidine | Benzenamine, 2-methyl-5-nitro- | 99-55-8 | U181 |
| 337 | Thallium and compounds, N.O.S 3 | Thallium and compounds, N O.S.3 | Same | 425 & 426 | 338 | Octachlorodibenzo-p-dioxin (OCDD) | 1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin | 3268-87-9 | |

| NRC Criterion 13 Hazardous Constituents (10 CFR 40, Appendix A) | | | | Equiv | EPA Hazardous Consituents (40 CFR 261, APPENDIX VIII) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NRC | *Promulgated by NRC circa 1987* | | | EPA | EPA | *Last Date of EPA Promulgation: 11/8/00* | | | |
| Order | Hazardous Constituent | Compound Names Parsed by DRC | | Order | Order | (verbatim listing) | | | |
| No. | (verbatim listing) | Chemical Name | Synonym | No | No. | Common name | Chemical abstracts name | CAS No. | HW No |
| 338 | Thallic oxide (Thallium (III) oxide) | Thallic oxide | Thallium (III) oxide | 427 | 339 | Octachlorodibenzofuran (OCDF) | 1,2,3,4,6,7,8,9-Octachlordibenofuran | 39001-02-0 | |
| 339 | Thallium (I) acetate (Acetic acid, thallium (I) salt) | Thallium (I) acetate | Acetic acid, thallium (I) salt | 428 | 340 | Octamethylpyrophosphoramide | Diphosphoramide, octamethyl- | 152-16-9 | P085 |
| 340 | Thallium (I) carbonate (Carbonic acid, dithallium (I) salt) | Thallium (I) carbonate | Carbonic acid, dithallium (I) salt | 429 | 341 | Osmium tetroxide | Osmium oxide OsO4, (T-4)- | 20816-12-0 | P087 |
| 341 | Thallium (I) chloride | Thallium (I) chloride | Same | 430 | 342 | Oxamyl | Ethanimidothioc acid, 2-(dimethylamino)-N-[[(methylamino)carbonyl]oxy]-2-oxo-,methyl ester | 23135-22-0 | P194 |
| 342 | Thallium (I) nitrate (Nitric acid, thallium (I) salt) | Thallium (I) nitrate | Nitric acid, thallium (I) salt | 431 | 343 | Paraldehyde | 1,3,5-Trioxane, 2,4,6-trimethyl- | 123-63-7 | U182 |
| 343 | Thallium selenite | Thallium selenite | Same | 432 | 344 | Parathion | Phosphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester | 56-38-2 | P089 |
| 344 | Thallium (I) sulfate (Sulfuric acid, thallium (I) salt) | Thallium (I) sulfate | Sulfuric acid, thallium (I) salt | 433 | 345 | Pebulate | Carbamothioic acid, butylethyl-, S-propyl ester | 1114-71-2 | |
| 345 | Thioacetamide (Ethanethioamide) | Thioacetamide | Ethanethioamide | 434 | 346 | Pentachlorobenzene | Benzene, pentachloro- | 608-93-5 | U183 |
| 346 | Thiosemicarbazide (Hydrazinecarbothioamide) | Thiosemicarbazide | Hydrazinecarbothioamide | 440 | 347 | Pentachlorodibenzo-p-dioxins | | | |
| 347 | Thiourea (Carbamide thio-) | Thiourea | Carbamide thio- | 441 | 348 | Pentachlorodibenzofurans | | | |
| 348 | Thiuram (Bis(dimethylthiocarbamoyl) disulfide) | Thiuram | Bis(dimethylthiocarbamoyl) disulfide | 442 | 349 | Pentachloroethane | Ethane, pentachloro- | 76-01-7 | U184 |
| 349 | **Thorium and compounds, N.O.S.,3 when producing thorium byproduct material** | **Thorium and compounds, N.O.S.,3 when producing thorium byproduct material** | **Same** | N.C. | 350 | Pentachloronitrobenzene (PCNB) | Benzene, pentachloronitro- | 82-68-8 | U185 |
| 350 | Toluene (Benzene, methyl-) | Toluene | Benzene, methyl- | 444 | 351 | Pentachlorophenol | Phenol, pentachloro- | 87-86-5 | See F027 |
| 351 | Toluenediamine (Diaminotoluene) | Toluenediamine | Diaminotoluene | 445 | 352 | Phenacetin | Acetamide, N-(4-ethoxyphenyl)- | 62-44-2 | U187 |
| 352 | o-Toluidine hydrochloride (Benzenamine, 2-methyl-, hydrochloride) | o-Toluidine hydrochloride | Benzenamine, 2-methyl-, hydrochloride | 451 | 353 | Phenol | Same | 108-95-2 | U188 |
| 353 | Tolylene diisocyanate (Benzene, l,3-diisocyanatomethyl-) | Tolylene diisocyanate | Benzene, l,3-diisocyanatomethyl- | 449 | 354 | Phenylenediamine | Benzenediamine | 25265-76-3 | |
| 354 | Toxaphene (Camphene, octachloro-) | Toxaphene | Camphene, octachloro- | 453 | 355 | Phenylmercury acetate | Mercury, (acetato-O)phenyl- | 62-38-4 | P092 |
| 355 | Tribromomethane (Bromoform) | Tribromomethane | Bromoform | 57 | 356 | Phenylthiourea | Thiourea, phenyl- | 103-85-5 | P093 |

| NRC Criterion 13 Hazardous Constituents (10 CFR 40, Appendix A) | | | | Equiv. | EPA Hazardous Consituents (40 CFR 261, APPENDIX VIII) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NRC | *Promulgated by NRC circa 1987* | | | EPA | EPA | *Last Date of EPA Promulgation: 11/8/00* | | | |
| Order | Hazardous Constituent | Compound Names Parsed by DRC | | Order | Order | (verbatim listing) | | | |
| No. | (verbatim listing) | Chemical Name | Synonym | No | No. | Common name | Chemical abstracts name | CAS No. | HW No |
| 356 | 1,2,4-Trichlorobenzene (Benzene, 1,2,4-trichloro-) | 1,2,4-Trichlorobenzene | Benzene, 1,2,4-trichloro- | 455 | 357 | Phosgene | Carbonic dichloride | 75-44-5 | P095 |
| 357 | 1,1,1-Trichloroethane (Methyl chloroform) | 1,1,1-Trichloroethane | Methyl chloroform | 279 | 358 | Phosphine | Same | 7803-51-2 | P096 |
| 358 | 1,1,2-Trichloroethane (Ethane, 1,1,2-trichloro-) | 1,1,2-Trichloroethane | Ethane, 1,1,2-trichloro- | 456 | 359 | Phorate | Phosphorodithioic acid, O,O-diethyl S-[(ethylthio)methyl] ester | 298-02-2 | P094 |
| 359 | Trichloroethene (Trichloroethylene) | Trichloroethene | Trichloroethylene | 457 | 360 | Phthalic acid esters, N.O S.1 | | | |
| 360 | Trichloromethanethiol (Methanethiol, trichloro-) | Trichloromethanethiol | Methanethiol, trichloro- | 458 | 361 | Phthalic anhydride | 1,3-Isobenzofurandione | 85-44-9 | U190 |
| 361 | Trichloromonofluoromethane (Methane, trichlorofluoro-) | Trichloromonofluoromethane | Methane, trichlorofluoro- | 459 | 362 | **Physostigmine** | Pyrrolo[2,3-b]indol-5-01, 1,2,3,3a,8,8ahexahydro-1,3a,8-trimethyl-, methylcarbamate (ester), (3aS-cis)- | 57-47-6 | P204 |
| 362 | 2,4,5-Trichlorophenol (Phenol, 2,4,5-trichloro-) | 2,4,5-Trichlorophenol | Phenol, 2,4,5-trichloro- | 460 | 363 | **Physostigmine salicylate** | Benzoic acid, 2-hydroxy-, compd. with (3aScis) - 1,2,3,3a,8,8a-hexahydro-1,3a,8-trimethylpyrrolo [2,3-b]indol-5-yl methylcarbamate ester (1:1) | 57-64-7 | P188 |
| 363 | 2,4,6-Trichlorophenol (Phenol, 2,4,6-trichloro-) | 2,4,6-Trichlorophenol | Phenol, 2,4,6-trichloro- | 461 | 364 | 2-Picoline | Pyridine, 2-methyl- | 109-06-8 | U191 |
| 364 | 2,4,5-Trichlorophenoxyacetic acid (2,4,5-T) (Acetic acid, 2,4,5-trichlorophenoxy-) | 2,4,5-Trichlorophenoxyacetic acid (2,4.5-T) | Acetic acid, 2,4,5-trichlorophenoxy- | 462 | 365 | Polychlorinated biphenyls, N.O S.1 | | | |
| 365 | 2,4,5-Trichlorophenoxypropionic acid (2,4,5-TP) (Silvex) (Propionoic acid, 2-(2,4,5-trichlorophenoxy)-) | Silvex (2,4,5-Trichlorophenoxypropionic acid or 2,4,5-TP) | Propionoic acid, 2-(2,4,5-trichlorophenoxy)- | 398 | 366 | Potassium cyanide | Potassium cyanide K(CN) | 151-50-8 | P098 |
| 366 | Trichloropropane, N.O.S.3 (Propane, trichloro-, N O S 3) | Trichloropropane, N O S. 3 | Propane, trichloro-, N.O S 3 | 463 | 367 | **Potassium dimethyldithiocarbamate** | Carbamodithioic acid, dimethyl, potassium salt | 128-03-0 | |
| 367 | 1,2,3-Trichloropropane (Propane, 1,2,3-trichloro-) | 1,2,3-Trichloropropane | Propane, 1,2,3-trichloro- | 464 | 368 | **Potassium n-hydroxymethyl-n-methyldithiocarbamate** | Carbamodithioic acid (hydroxymethyl)methyl-, monopotassium salt | 51026-28-9 | |
| 368 | O,O,O-Triethyl phosphorothioate (Phosphorothioic acid, O,O,O-triethyl ester) | O,O,O-Triethyl phosphorothioate | Phosphorothioic acid, O,O,O-triethyl ester | 466 | 369 | **Potassium n-methyldithiocarbamate** | Carbamodithioic acid, methylmonopotassium salt | 137-41-7 | |
| 369 | sym-Trinitrobenzene (Benzene, 1,3,5-trinitro-) | sym-Trinitrobenzene | Benzene, 1,3,5-trinitro- | 467 | 370 | **Potassium pentachlorophenate** | Pentachlorophenol, potassium salt | 7778736 | None |

| NRC Criterion 13 Hazardous Constituents (10 CFR 40, Appendix A) | | | | Equiv. | EPA Hazardous Consituents (40 CFR 261, APPENDIX VIII) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NRC | *Promulgated by NRC circa 1987* | | | EPA | EPA | *Last Date of EPA Promulgation: 11/8/00* | | | |
| Order | Hazardous Constituent | Compound Names Parsed by DRC | | Order | Order | (verbatim listing) | | | |
| No. | (verbatim listing) | Chemical Name | Synonym | No | No | Common name | Chemical abstracts name | CAS No | HW No |
| 370 | Tris(1-azridinyl) phosphine sulfide (Phosphine sulfide, tris(1-aziridinyl-) | Tris(1-azridinyl) phosphine sulfide | Phosphine sulfide, tris(1-aziridinyl- | 468 | 371 | Potassium silver cyanide | Argentate(1-), bis(cyano-C)-, potassium | 506-61-6 | P099 |
| 371 | Tris(2,3-dibromopropyl) phosphate (1-Propanol, 2,3-dibromo-, phosphate) | Tris(2,3-dibromopropyl) phosphate | 1-Propanol, 2,3-dibromo-, phosphate | 469 | 372 | **Promecarb** | Phenol, 3-methyl-5-(1-methylethyl)-, methyl carbamate | 2631-37-0 | P201 |
| 372 | Trypan blue (2,7-Naphthalenedisulfonic acid, 3,3'-[(3,3'-dimethyl (1,1'-biphenyl)-4,4'-diyl)bis(azo)]bis(5-amino-4-hydroxy-, tetrasodium salt) | Trypan blue | 2,7-Naphthalenedisulfonic acid, 3,3'-[(3,3'-dimethyl (1,1'-biphenyl)- 4,4'-diyl)bis(azo)]bis(5-amino-4-hydroxy-, tetrasodium salt | 470 | 373 | Pronamide | Benzamide, 3,5-dichloro-N-(1,1-dimethyl-2-propynyl)- | 23950-58-5 | U192 |
| 373 | Uracil mustard (Uracil 5-[bis(2-chloroethyl)amino]-) | Uracil mustard | Uracil 5-[bis(2-chloroethyl)amino]- | 471 | 374 | 1,3-Propane sultone | 1,2-Oxathiolane, 2,2-dioxide | 1120-71-4 | U193 |
| 374 | **Uranium and compounds, N.O.S.3** | **Uranium and compounds, N.O.S.3** | **Same** | **N.C.** | 375 | n-Propylamine | 1-Propanamine | 107-10-8 | U194 |
| 375 | Vanadic acid, ammonium salt (ammonium vanadate) | Vanadic acid | ammonium vanadate | 21 | 376 | Propargyl alcohol | 2-Propyn-1-ol | 107-19-7 | P102 |
| 376 | Vanadium pentoxide (Vanadium (V) oxide) | Vanadium pentoxide | Vanadium (V) oxide | 472 | 377 | **Propham** | Carbamic acid, phenyl-, 1-methylethyl ester | 122-42-9 | U373 |
| 377 | Vinyl chloride (Ethene, chloro-) | Vinyl chloride | Ethene, chloro- | 474 | 378 | **Propoxur** | Phenol, 2-(1-methylethoxy)-,methylcarbamate | 114-26-1 | U411 |
| 378 | Zinc cyanide | Zinc cyanide | Same | 479 | 379 | Propylene dichloride | Propane, 1,2-dichloro- | 78-87-5 | U083 |
| 379 | Zinc phosphide | Zinc phosphide | Same | 480 & 481 | 380 | 1,2-Propylenimine | Aziridine, 2-methyl- | 75-55-8 | P067 |
| | 380 | = Total Number of NRC Hazardous Constituents (circa 1987) | | | 381 | Propylthiouracil | 4(1H)-Pyrimidinone, 2,3-dihydro-6-propyl-2-thioxo- | 51-52-5 | |
| | | | | | 382 | **Prosulfocarb** | Carbamothioic acid, dipropyl-, S-(phenylmethyl) ester. | 52888-80-9 | U387 |
| | 8 | = Number of 1987 Parameters Removed by EPA | | | 383 | Pyridine | Same | 110-86-1 | U196 |
| | | | | | 384 | Reserpine | Yohimban-16-carboxylic acid, 11,17-dimethoxy-18-[(3,4,5-trimethoxybenzoyl)oxy]-smethyl ester,(3beta,16beta,17alpha,18beta,20alpha)-. | 50-55-5 | U200 |
| | | | | | 385 | Resorcinol | 1,3-Benzenediol | 108-46-3 | U201 |
| | | | | | 386 | Saccharin | 1,2-Benzisothiazol-3(2H)-one, 1,1-dioxide | 81-07-2 | U202 |

| NRC Criterion 13 Hazardous Constituents (10 CFR 40, Appendix A) | | | | Equiv. | EPA Hazardous Consituents (40 CFR 261, APPENDIX VIII) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NRC | *Promulgated by NRC circa 1987* | | | EPA | EPA | *Last Date of EPA Promulgation: 11/8/00* | | | |
| Order | Hazardous Constituent | Compound Names Parsed by DRC | | Order | Order | (verbatim listing) | | | |
| No | (verbatim listing) | Chemical Name | Synonym | No | No | Common name | Chemical abstracts name | CAS No | HW No. |
| | | | | | 387 | Saccharin salts | | | U202 |
| | | | | | 388 | Safrole | 1,3-Benzodioxole, 5-(2-propenyl) | 94-59-7 | U203 |
| | | | | | 389 | Selenium | Same | 7782-49-2 | |
| | | | | | 390 | Selenium compounds, N O.S.1 | | | |
| | | | | | 391 | Selenium dioxide | Selenious acid | 7783-00-8 | U204 |
| | | | | | 392 | Selenium sulfide | Selenium sulfide SeS2 | 7488-56-4 | U205 |
| | | | | | 393 | **Selenium, tetrakis(dimethyl-dithiocarbamate)** | Carbamodithioic acid, dimethyl-tetraanhydrosulfide with orthothioselenious acid | 144-34-3 | |
| | | | | | 394 | Selenourea | Same | 630-10-4 | P103 |
| | | | | | 395 | Silver | Same | 7440-22-4 | |
| | | | | | 396 | Silver compounds, N.O.S 1 | | | |
| | | | | | 397 | Silver cyanide | Silver cyanide Ag(CN) | 506-64-9 | P104 |
| | | | | | 398 | Silvex (2,4,5-TP) | Propanoic acid, 2-(2,4,5-trichlorophenoxy)- | 93-72-1 | See F027 |
| | | | | | 399 | Sodium cyanide | Sodium cyanide Na(CN) | 143-33-9 | P106 |
| | | | | | 400 | **Sodium dibutyldithiocarbamate** | Carbamodithioic acid, dibutyl, sodium salt | 136-30-1 | |
| | | | | | 401 | **Sodium diethyldithiocarbamate** | Carbamodithioic acid, diethyl-, sodium salt | 148-18-5 | |
| | | | | | 402 | **Sodium dimethyldithiocarbamate** | Carbamodithioic acid, dimethyl-, sodium salt | 128-04-1 | |
| | | | | | 403 | **Sodium pentachlorophenate** | Pentachlorophenol, sodium salt | 131522 | None |
| | | | | | 404 | Streptozotocin | D-Glucose, 2-deoxy-2-[[(methylnitrosoamino)carbonyl]amino]- | 18883-66-4 | U206 |
| | | | | | 405 | Strychnine | Strychnidin-10-one | 57-24-9 | P108 |
| | | | | | 406 | Strychnine salts | | | P108 |
| | | | | | 407 | **Sulfallate** | Carbamodithioic acid, diethyl-, 2-chloro-2-propenyl ester | 95-06-7 | |
| | | | | | 408 | TCDD | Dibenzo[b,e][1,4]dioxin, 2,3,7,8-tetrachloro- | 1746-01-6 | |
| | | | | | 409 | **Tetrabutylthiuram disulfide** | Thioperoxydicarbonic diamide, tetrabutyl | 1634-02-2 | |
| | | | | | 410 | 1,2,4,5-Tetrachlorobenzene | Benzene, 1,2,4,5-tetrachloro- | 95-94-3 | U207 |
| | | | | | 411 | Tetrachlorodibenzo-p-dioxins | | | |
| | | | | | 412 | **Tetrachlorodibenzofurans** | | | |
| | | | | | 413 | Tetrachloroethane, N O.S.1 | Ethane, tetrachloro-, N O S. | 25322-20-7 | .... |
| | | | | | 414 | 1,1,1,2-Tetrachloroethane | Ethane, 1,1,1,2-tetrachloro- | 630-20-6 | U208 |
| | | | | | 415 | 1,1,2,2-Tetrachloroethane | Ethane, 1,1,2,2-tetrachloro- | 79-34-5 | U209 |
| | | | | | 416 | **Tetrachloroethylene** | Ethene, tetrachloro- | 127-18-4 | U210 |

| NRC Criterion 13 Hazardous Constituents (10 CFR 40, Appendix A) | | | | Equiv. | EPA Hazardous Consituents (40 CFR 261, APPENDIX VIII) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NRC | *Promulgated by NRC circa 1987* | | | EPA | EPA | *Last Date of EPA Promulgation 11/8/00* | | | |
| Order | Hazardous Constituent | Compound Names Parsed by DRC | | Order | Order | (verbatim listing) | | | |
| No. | (verbatim listing) | Chemical Name | Synonym | No. | No | Common name | Chemical abstracts name | CAS No | HW No |
| | | | | | 417 | 2,3,4,6-Tetrachlorophenol | Phenol, 2,3,4,6-tetrachloro- | 58-90-2 | See F027 |
| | | | | | 418 | **2,3,4,6-tetrachlorophenol, potassium salt** | same | 53535276 | None |
| | | | | | 419 | **2,3,4,6-tetrachlorophenol, sodium salt** | same | 25567559 | None |
| | | | | | 420 | Tetraethyldithiopyrophosphate | Thiodiphosphoric acid, tetraethyl ester | 3689-24-5 | P109 |
| | | | | | 421 | Tetraethyl lead | Plumbane, tetraethyl- | 78-00-2 | P110 |
| | | | | | 422 | Tetraethyl pyrophosphate | Diphosphoric acid, tetraethyl ester | 107-49-3 | P111 |
| | | | | | 423 | **Tetramethylthiuram monosulfide** | Bis(dimethylthiocarbamoyl) sulfide | 97-74-5 | |
| | | | | | 424 | Tetranitromethane | Methane, tetranitro- | 509-14-8 | P112 |
| | | | | | 425 | Thallium | Same | 7440-28-0 | |
| | | | | | 426 | Thallium compounds, N.O.S.1 | | | |
| | | | | | 427 | Thallic oxide | Thallium oxide Tl2 O3 | 1314-32-5 | P113 |
| | | | | | 428 | Thallium(I) acetate | Acetic acid, thallium(1+) salt | 563-68-8 | U214 |
| | | | | | 429 | Thallium(I) carbonate | Carbonic acid, dithallium(1+) salt | 6533-73-9 | U215 |
| | | | | | 430 | Thallium(I) chloride | Thallium chloride TlCl | 7791-12-0 | U216 |
| | | | | | 431 | Thallium(I) nitrate | Nitric acid, thallium(1+) salt | 10102-45-1 | U217 |
| | | | | | 432 | Thallium selenite | Selenious acid, dithallium(1+) salt | 12039-52-0 | P114 |
| | | | | | 433 | Thallium(I) sulfate | Sulfuric acid, dithallium(1+) salt | 7446-18-6 | P115 |
| | | | | | 434 | Thioacetamide | Ethanethioamide | 62-55-5 | U218 |
| | | | | | 435 | **Thiodicarb** | Ethanimidothioic acid, N,N'-[thiobis [(methylimino) carbonyloxy]] bis-, dimethyl ester | 59669-26-0 | U410 |
| | | | | | 436 | Thiofanox | 2-Butanone, 3,3-dimethyl-1-(methylthio)-, 0-[(methylamino)carbonyl] oxime. | 39196-18-4 | P045 |
| | | | | | 437 | Thiomethanol | Methanethiol | 74-93-1 | U153 |
| | | | | | 438 | **Thiophanate-methyl** | Carbamic acid, [1,2-phyenylenebis (iminocarbonothioyl)] bis-, dimethyl ester | 23564-05-8 | U409 |
| | | | | | 439 | Thiophenol | Benzenethiol | 108-98-5 | P014 |
| | | | | | 440 | Thiosemicarbazide | Hydrazinecarbothioamide | 79-19-6 | P116 |
| | | | | | 441 | Thiourea | Same | 62-56-6 | U219 |
| | | | | | 442 | Thiram | Thioperoxydicarbonic diamide [(H2 N)C(S)]2 S2, tetramethyl- | 137-26-8 | U244 |

| NRC Criterion 13 Hazardous Constituents (10 CFR 40, Appendix A) | | | | Equiv | EPA Hazardous Consituents (40 CFR 261, APPENDIX VIII) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NRC | *Promulgated by NRC circa 1987* | | | EPA | EPA | *Last Date of EPA Promulgation: 11/8/00* | | | |
| Order | Hazardous Constituent | Compound Names Parsed by DRC | | Order | Order | (verbatim listing) | | | |
| No. | (verbatim listing) | Chemical Name | Synonym | No. | No. | Common name | Chemical abstracts name | CAS No | HW No. |
| | | | | | 443 | Tirpate | 1,3-Dithiolane-2-carboxaldehyde, 2,4-dimethyl-,O-[(methylamino) carbonyl] oxime | 26419-73-8 | P185 |
| | | | | | 444 | Toluene | Benzene, methyl- | 108-88-3 | U220 |
| | | | | | 445 | Toluenediamine | Benzenediamine, ar-methyl- | 25376-45-8 | U221 |
| | | | | | 446 | Toluene-2,4-diamine | 1,3-Benzenediamine, 4-methyl- | 95-80-7 | |
| | | | | | 447 | Toluene-2,6-diamine | 1,3-Benzenediamine, 2-methyl- | 823-40-5 | |
| | | | | | 448 | Toluene-3,4-diamine | 1,2-Benzenediamine, 4-methyl- | 496-72-0 | |
| | | | | | 449 | Toluene diisocyanate | Benzene, 1,3-diisocyanatomethyl- | 26471-62-5 | U223 |
| | | | | | 450 | o-Toluidine | Benzenamine, 2-methyl- | 95-53-4 | U328 |
| | | | | | 451 | o-Toluidine hydrochloride | Benzenamine, 2-methyl-, hydrochloride | 636-21-5 | U222 |
| | | | | | 452 | p-Toluidine | Benzenamine, 4-methyl- | 106-49-0 | U353 |
| | | | | | 453 | Toxaphene | Same | 8001-35-2 | P123 |
| | | | | | 454 | Triallate | Carbamothioic acid, bis(1-methylethyl)-, S-(2,3,3-trichloro-2 propenyl) ester | 2303-17-5 | U389 |
| | | | | | 455 | 1,2,4-Trichlorobenzene | Benzene, 1,2,4-trichloro- | 120-82-1 | |
| | | | | | 456 | 1,1,2-Trichloroethane | Ethane, 1,1,2-trichloro- | 79-00-5 | U227 |
| | | | | | 457 | Trichloroethylene | Ethene, trichloro- | 79-01-6 | U228 |
| | | | | | 458 | Trichloromethanethiol | Methanethiol, trichloro- | 75-70-7 | P118 |
| | | | | | 459 | Trichloromonofluoromethane | Methane, trichlorofluoro- | 75-69-4 | U121 |
| | | | | | 460 | 2,4,5-Trichlorophenol | Phenol, 2,4,5-trichloro- | 95-95-4 | See F027 |
| | | | | | 461 | 2,4,6-Trichlorophenol | Phenol, 2,4,6-trichloro- | 88-06-2 | See F027 |
| | | | | | 462 | 2,4,5-T | Acetic acid, (2,4,5-trichlorophenoxy)- | 93-76-5 | See F027 |
| | | | | | 463 | Trichloropropane, N.O.S.1 | | 25735-29-9 | |
| | | | | | 464 | 1,2,3-Trichloropropane | Propane, 1,2,3-trichloro- | 96-18-4 | |
| | | | | | 465 | Triethylamine | Ethanamine, N,N-diethyl- | 121-44-8 | U404 |
| | | | | | 466 | O,O,O-Triethyl phosphorothioate | Phosphorothioic acid, O,O,O-triethyl ester | 126-68-1 | |
| | | | | | 467 | 1,3,5-Trinitrobenzene | Benzene, 1,3,5-trinitro- | 99-35-4 | U234 |
| | | | | | 468 | Tris(1-aziridinyl)phosphine sulfide | Aziridine, 1,1',1''-phosphinothioylidynetris- | 52-24-4 | |
| | | | | | 469 | Tris(2,3-dibromopropyl) phosphate | 1-Propanol, 2,3-dibromo-, phosphate (3:1) | 126-72-7 | U235 |

| NRC Criterion 13 Hazardous Constituents (10 CFR 40, Appendix A) | | | | Equiv. | EPA Hazardous Consituents (40 CFR 261, APPENDIX VIII) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NRC | *Promulgated by NRC circa 1987* | | | EPA | EPA | *Last Date of EPA Promulgation: 11/8/00* | | | |
| Order | Hazardous Constituent | Compound Names Parsed by DRC | | Order | Order | (verbatim listing) | | | |
| No. | (verbatim listing) | Chemical Name | Synonym | No. | No | Common name | Chemical abstracts name | CAS No | HW No. |
| | | | | | 470 | Trypan blue | 2,7-Naphthalenedisulfonic acid, 3,3'-[(3,3'-dimethyl[1,1'-biphenyl]-4,4'-diyl)bis(azo)]-bis[5-amino-4-hydroxy-, tetrasodium salt | 72-57-1 | U236 |
| | | | | | 471 | Uracil mustard | 2,4-(1H,3H)-Pyrimidinedione, 5-[bis(2-chloroethyl)amino]- | 66-75-1 | U237 |
| | | | | | 472 | Vanadium pentoxide | Vanadium oxide V2 O5 | 1314-62-1 | P120 |
| | | | | | 473 | **Vernolate** | Carbamothioic acid, dipropyl-,S-propyl ester | 1929-77-7 | |
| | | | | | 474 | Vinyl chloride | Ethene, chloro- | 75-01-4 | U043 |
| | | | | | 475 | Warfarin | 2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, when present at concentrations less than 0.3% | 81-81-2 | U248 |
| | | | | | 476 | Warfarin | 2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, when present at concentrations greater than 0.3% | 81-81-2 | P001 |
| | | | | | 477 | Warfarin salts, when present at concentrations less than 0.3%. | | | U248 |
| | | | | | 478 | Warfarin salts, when present at concentrations greater than 0.3%. | | | P001 |
| | | | | | 479 | Zinc cyanide | Zinc cyanide Zn(CN)2 | 557-21-1 | P121 |
| | | | | | 480 | Zinc phosphide | Zinc phosphide Zn3 P2, when present at concentrations greater than 10% | 1314-84-7 | P122 |
| | | | | | 481 | Zinc phosphide | Zinc phosphide Zn3 P2, when present at concentrations of 10% or less | 1314-84-7 | U249 |
| | | | | | 482 | **Ziram** | Zinc, bis(dimethylcarbamodithioato-S,S')-,(T-4)- | 137-30-4 | P205 |
| | | | | | | 482 | = Total Number of Current EPA Parameters | | |
| | | | | | | 84 | = Number of New EPA Parameters (post-1987) | | |

**Cell:** H2
**Comment:** Current EPA Hazardous Constituents from EPA rules found on Internet at:
http://www.access.gpo.gov/nara/cfr/cfrhtml_00/Title_40/40cfr261_00.html
Downloaded on 7/30/02.

History of Changes to this EPA Rule is as follows:
[53 FR 13388, Apr. 22, 1988, as amended at 53 FR 43881, Oct. 31, 1988; 54 FR 50978, Dec. 11, 1989; 55 FR 50483, Dec. 6, 1990; 56 FR 7568, Feb. 25, 1991; 59 FR 468, Jan. 4, 1994; 59 FR 31551, June 20, 1994; 60 FR 7853, Feb. 9, 1995; 60 FR 19165, Apr. 17, 1995; 62 FR 32977, June 17, 1997; 63 FR 24625, May 4, 1998; 65 FR 14475, Mar. 17, 2000; 65 FR 67127, Nov. 8. 2000].

**Cell:** B3
**Comment:** NRC Criterion 13, Hazardous Constituent: the name listed in this column is verbatim from the NRC regulation. The name in parentheses constitutes the chemical synonym for the compound listed.

**Cell:** A4
**Comment:** NRC Order Number: given by the DRC in this spreadsheet to serve as a sequential identification number for the various compounds published in the NRC rule, 10 CFR 40, Appendix A, Criterion 13.

**Cell:** D4
**Comment:** NRC Criterion 13, Chemical Synonym: this equivalent compound name was originally found in parentheses in 10 CFR 40, Appendix A, Criterion 13.

**Cell:** G4
**Comment:** EPA Order Number: given by the DRC in this spreadsheet to serve as a sequential identification number for the various compounds published in the EPA rule, 40 CFR 261, Appendix VIII.

**Cell:** B23
**Comment:** 4-Aminopyridine (or 4-Pyridinamine): error made in 10 CFR 40, Appendix A, Criterion 13 in that this compound was mistakenly combined with the one ahead of it on the Criterion 13 list [5-(Aminomethyl)-3-isoxazolol].

**Cell:** H30
**Comment:** 1 The abbreviation N.O.S. (not otherwise specified) signifies those members of the general class not specifically listed by name in this appendix.

**Cell:** E62
**Comment:** N.C. = No Correlation

**Cell:** H207
**Comment:** Other Synonyms for Epichlorohydrin Include*:
1-chlor-2,3-epoxypropane
chloromethyloxirane
2-chloropropylene oxide
y-chloropropyleneoxide
epichlorhydrin

* from EPA IRIS database for Epichlorohydrin at Internet address:

http://www.epa.gov/iris/subst/0050.htm#syn.

**Cell:** C247
**Comment:** Another Synonym = Aldicarb.

**Cell:** I303
**Comment:** Other Synonyms for MNNG:
1-METHYL-1-NITROSO-3-NITROGUANIDINE
(from EPA Envirofacts Master Chemical Integrator database at Internet address:
http://www.epa.gov/enviro/html/emci/chemref/70257.html)

**Cell:** C337
**Comment:** Other Synonyms for Tetrachloroethane *:
79-34-5
ACETYLENE TETRACHLORIDE
BONOFORM
CELLON
1,1,2,2-CZTEROCHLOROETAN
1,1-DICHLORO-2,2-DICHLOROETHANE
ETHANE, 1,1,2,2-TETRACHLORO-
NCI-C03554
RCRA WASTE NUMBER U209
TCE
1,1,2,2-TETRACHLOORETHAAN
1,1,2,2-TETRACHLORAETHAN
TETRACHLORETHANE
1,1,2,2-TETRACHLORETHANE
1,1,2,2-Tetrachloroethane
Tetrachloroethane, 1,1,2,2-
sym-TETRACHLOROETHANE
TETRACHLORURE D'ACETYLENE
1,1,2,2-TETRACLOROETANO
UN 1702
WESTRON

* From EPA IRIS Internet database at:
http://www.epa.gov/iris/subst/0193.htm#syn

**Cell:** B360
**Comment:** Tolylene diisocyanate: this compound is mis-spelled in 10 CFR 40, Appendix A, Criterion 13. Comparison of the synonyms from both the NRC and EPA lists shows this compound is Toluene diisocyante.

**Cell:** H422
**Comment:** Other Synonyms for Tetrachloroethylene *:

127-18-4
Ankilostin
Antisal 1
Antisol 1
Carbon bichloride
Carbon dichloride
Czterochloroetylen
Dee-Solv
Didakene
Didokene
Dowclene EC
Dow-Per
ENT 1,860
Ethene, tetrachloro-
Ethylene tetrachloride
Ethylene, tetrachloro-
Fedal-Un
NCI-C04580
Nema
PCE
PER
Perawin
PERC
Perchloorethyleen, per
Perchlor
Perchloraethylen, per
Perchlorethylene
Perchlorethylene, per
Perchloroethylene
Perclene
Percloroetilene
Percosolv
Percosolve
PERK
Perklone
Persec
Tetlen
Tetracap
Tetrachlooretheen
Tetrachloraethen
Tetrachlorethylene
Tetrachloroethene
Tetrachloroethylene
1,1,2,2-Tetrachloroethylene.

Tetracloroetene
Tetraguer
Tetraleno
Tetralex
Tetravec
Tetroguer
Tetropil
WLN: GYGUYGG

* from EPA IRIS Internet database at:
http://www.epa.gov/iris/subst/0106.htm#syn.

**Cell:** H463
**Comment:** Other synonyms for Trichloroethylene *:
79-01-6
ACETYLENE TRICHLORIDE
ALGYLEN
ANAMENTH
BENZINOL
BLACOSOLV
BLANCOSOLV
CECOLENE
CHLORILEN
1-CHLORO-2,2-DICHLOROETHYLENE
CHLORYLEA
CHLORYLEN
CHORYLEN
CIRCOSOLV
CRAWHASPOL
DENSINFLUAT
1,1-DICHLORO-2-CHLOROETHYLENE
DOW-TRI
DUKERON
ETHINYL TRICHLORIDE
ETHYLENE TRICHLORIDE
ETHYLENE, TRICHLORO-
FLECK-FLIP
FLOCK FLIP
FLUATE
GEMALGENE
GERMALGENE
LANADIN
LETHURIN
NARCOGEN

NARKOGEN
NARKOSOID
NCI-C04546
NIALK
PERM-A-CHLOR
PERM-A-CLOR
PETZINOL
PHILEX
RCRA WASTE NUMBER U228
TCE
THRETHYLEN
THRETHYLENE
TRETHYLENE
TRI
TRIAD
TRIAL
TRIASOL
TRICHLOORETHEEN
TRICHLOORETHYLEEN, TRI
TRICHLORAETHEN
TRICHLORAETHYLEN, TRI
TRICHLORAN
TRICHLOREN
TRICHLORETHENE
TRICHLORETHYLENE
TRICHLORETHYLENE, TRI
TRICHLOROETHENE
Trichloroethylene
1,1,2-TRICHLOROETHYLENE
1,2,2-TRICHLOROETHYLENE
TRI-CLENE
TRICLORETENE
TRICLOROETILENE
TRIELENE
TRIELIN
TRIELINA
TRIKLONE
TRILEN
TRILENE
TRILINE
TRIMAR
TRIOL
TRI-PLUS
TRI-PLUS M

UN 1710
VESTROL
VITRAN
WESTROSOL

* from EPA IRIS Internet database at:
http://www.epa.gov/iris/subst/0199.htm#syn.

# ATTACHMENT 3

Selected Citations from the Utah Water Quality Act

and the

Utah Ground Water Quality Protection Regulations

Selected Citations from the Utah Water Quality Act (UCA 19-5) - listed in published order:

**19-5-102(3):** "Discharge" means the addition of any pollutant to any waters of the state.

**19-5-102 (9):** "Pollution" means any man-made or man-induced alteration of the chemical, physical, biological, or radiological integrity of any waters of the state, unless the alteration is necessary for the public health and safety.

**19-5-102(10):** "Publicly owned treatment works" means any facility for the treatment of pollutants owned by the state, its political subdivisions, or other public entity.

**19-5-102 (14):** "Treatment works" means any plant, disposal field, lagoon, dam, pumping station, incinerator, or other works used for the purpose of treating, stabilizing, or holding wastes.

**19-5-102 (17):** "Waste" or "pollutant" means dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into water.

**19-5-102 (18):** "Waters of the state":
(a) means all streams, lakes, ponds, marshes, waterc6ourses, waterways, wells, springs, irrigation systems, drainage systems, and all other bodies or accumulations of water, surface and underground, natural or artificial, public or private, which are contained within, flow through, or border upon this state or any portion of the state; and
(b) does not include bodies of water confined to and retained within the limits of private property, and which do not develop into or constitute a nuisance, a public health hazard, or a menace to fish or wildlife.

**19-5-104(1)(e), (h), and (i): Powers and duties of board.**
(1) The board has the following powers and duties, but the board shall give priority to pollution that results in hazards to the public health:
...
(e) adopt, modify, or repeal standards of quality of the waters of the state and classify those waters according to their reasonable uses in the interest of the public under conditions the board may prescribe for the prevention, control, and abatement of pollution; ...
(h) review plans, specifications, or other data relative to disposal systems or any part of disposal systems, and issue construction permits for the installation or modification of treatment works or any parts of them;
(i) after public notice and opportunity for a public hearing, issue, continue in effect, revoke, modify, or deny discharge permits under reasonable conditions the board may prescribe to control the management of sewage sludge or to prevent or control the discharge of pollutants, including effluent limitations for the discharge of wastes into the waters of the state;

**19-5-107 (1)(a):** Except as provided in this chapter or rules made under it, it is unlawful for any person to discharge a pollutant into waters of the state or to cause pollution which constitutes a menace to public health and welfare, or is harmful to wildlife, fish or aquatic life, or impairs domestic, agricultural, industrial, recreational, or other beneficial uses of water, or to place or cause to be placed any wastes in a location where there is probable cause to believe it will cause pollution.

**19-5-107 (3) and (3)(b):** It is unlawful for any person, without first securing a permit from the executive secretary as authorized by the board, to:

...
...(b) construct, install, modify, or operate any treatment works or part of any treatment works or any extension or addition to any treatment works, or construct, install, or operate any establishment or extension or modification of or addition to any treatment works, the operation of which would probably result in a discharge.

Selected Citations from the Utah Ground Water Quality Protection Regulations – listed in published order:

**R317-6-1.1**: "Aquifer" means a geologic formation, group of geologic formations or part of a geologic formation that contains sufficiently saturated permeable material to yield usable quantities of water to wells and springs.

**R317-6-1.3**: "Best Available Technology" means the application of design, equipment, work practice, operation standard or combination thereof at a facility to effect the maximum reduction of a pollutant achievable by available processes and methods taking into account energy, public health, environmental and economic impacts and other costs.

**R317-6-1.10**: "Compliance Monitoring Point" means a well, seep, spring, or other sampling point used to determine compliance with applicable permit limits.

**R317-6-1.13**: "Discharge" means the release of a pollutant directly or indirectly into subsurface waters of the state.

**R317-6-1.19**: "Ground Water" means subsurface water in the zone of saturation including perched ground water.

**R317-6-1.20**: "Ground Water Quality Standards" means numerical contaminant concentration levels adopted by the Board in or under R317-6-2 for the protection of the subsurface waters of the State.

**R317-6-1.28**: "Point of Discharge" means the area within outermost location at which effluent or leachate has been stored, applied, disposed of, or discharged; for a diked facility, the outermost edge of the dikes.

**R317-6-1.30**: "Pollution" means such contamination, or other alteration of the physical, chemical, or biological properties of any waters of the State, or such discharge of any liquid, gaseous, or solid substance into any waters of the state as will create a nuisance or render such waters harmful or detrimental or injurious to public health, safety, or welfare, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or to livestock, wild animals, birds, fish or other aquatic life.

**R317-6-1.39**: "Water Table" means the top of the saturated zone of a body of unconfined ground water at which the pressure is equal to that of the atmosphere.

**R317-6-1.40**: "Water Table Aquifer" means an aquifer extending downward from the water table to the first confining bed.

**R317-6-2: Ground Water Quality Standards**

2.1: The following Ground Water Quality Standards as listed in Table I are adopted for protection of ground water quality.

TABLE 1

GROUND WATER QUALITY STANDARDS

| Parameter | Milligrams per liter (mg/l) unless noted otherwise and based on analysis of filtered sample except for Mercury and organic compounds |
|---|---|
| PHYSICAL CHARACTERISTICS | |

| | |
|---|---|
| Color (units) | 15.0 |
| Corrosivity (characteristic) | noncorrosive |
| Odor (threshold number) | 3.0 |
| pH (units) | 6.5-8.5 |
| | |
| INORGANIC CHEMICALS | |
| Cyanide (free) | 0.2 |
| Fluoride | 4.0 |
| Nitrate (as N) | 10.0 |
| Nitrite (as N) | 1.0 |
| Total Nitrate/Nitrite (as N) | 10.0 |
| | |
| METALS | |
| Arsenic | 0.05 |
| Barium | 2.0 |
| Cadmium | 0.005 |
| Chromium | 0.1 |
| Copper | 1.3 |
| Lead | 0.015 |
| Mercury | 0.002 |
| Selenium | 0.05 |
| Silver | 0.1 |
| Zinc | 5.0 |
| | |
| ORGANIC CHEMICALS | |
| Pesticides and PCBs | |
| Alachlor | 0.002 |
| Aldicarb | 0.003 |
| Aldicarb sulfone | 0.002 |
| Aldicarb sulfoxide | 0.004 |
| Atrazine | 0.003 |
| Carbofuran | 0.04 |
| Chlordane | 0.002 |
| Dibromochloropropane | 0.0002 |
| 2, 4-D | 0.07 |
| Diquat | 0.02 |
| Dichlorophenoxyacetic acid (2, 4-) (2,4D) | 0.07 |
| Endothall | 0.1 |
| Endrin | 0.002 |
| Ethylene Dibromide | 0.00005 |
| Heptachlor | 0.0004 |
| Heptachlor epoxide | 0.0002 |
| Lindane | 0.0002 |
| Methoxychlor | 0.04 |

| | |
|---|---|
| Polychlorinated Biphenyls | 0.0005 |
| Pentachlorophenol | 0.001 |
| Toxaphene | 0.003 |
| 2, 4, 5-TP (Silvex) | 0.05 |

VOLATILE ORGANIC CHEMICALS

| | |
|---|---|
| Benzene | 0.005 |
| Carbon tetrachloride | 0.005 |
| 1, 2 – Dichloroethane | 0.005 |
| 1, 1 –Dichloroethylene | 0.007 |
| 1, 1, 1-Trichloroethane | 0.200 |
| para – Dichlorobenzene | 0.075 |
| o-Dichlorobenzene | 0.6 |
| cis-1,2 dichloroethylene | 0.07 |
| trans-1,2 dichloroethylene | 0.1 |
| 1,2 Dichloropropane | 0.005 |
| Ethylbenzene | 0.7 |
| Monochlorobenzene | 0.1 |
| Styrene | 0.1 |
| Tetrachloroethylene | 0.005 |
| Toluene | 1 |
| Trichloroethylene | 0.005 |
| Vinyl chloride | 0.002 |
| Xylenes (Total) | 10 |

OTHER ORGANIC CHEMICALS

| | |
|---|---|
| Trihalomethanes | 0.1 |

RADIONUCLIDES

The following are the maximum contaminant levels for Radium-226 and Radium-228, and gross alpha particle radioactivity, beta particle radioactivity, and photon radioactivity:

| | |
|---|---|
| Combined Radium-226 and Radium-228 | 5pCi/l |
| Gross alpha particle activity, including Radium-226 but excluding Radon and Uranium | 15pCi/l |

Beta particle and photon radioactivity

The average annual concentration from man-made radionuclides of beta particle and photon radioactivity from man-made radionuclides shall not produce an annual dose equivalent to the total body or any internal organ greater than four millirem/year.

Except for the radionuclides listed below, the concentration of man-made radionuclides causing four millirem total body

or organ dose equivalents shall be calculated on the basis of a two liter per day drinking water intake using the 168 hour data listed in "Maximum Permissible Body Burden and Maximum Permissible Concentration Exposure", NBS Handbook 69 as amended August 1962, U.S. Department of Commerce. If two or more radionuclides are present, the sum of their annual dose equivalent to the total body or to any organ shall not exceed four millirem/year.

Average annual concentrations assumed to produce a total body or organ dose of four millirem/year:

| Radionuclide | Critical Organ | pCi per liter |
|---|---|---|
| Tritium | Total Body | 20,000 |
| Strontium-90 | Bone Marrow | 8 |

**R317-6-2.2:** A permit specific ground water quality standard for any pollutant not specified in Table 1 may be established by the Executive Secretary at a level that will protect public health and the environment. This permit limit may be based on U.S. Environmental Protection Agency maximum contaminant level goals, health advisories, risk based contaminant levels, standards established by other regulatory agencies and other relevant information

**R317-6-3:** Ground Water Classes

3.1 GENERAL

The following ground water classes are established: Class IA - Pristine Ground Water; Class IB - Irreplaceable Ground Water; Class IC - Ecologically Important Ground Water; Class II - Drinking Water Quality Ground Water; Class III - Limited Use Ground Water; Class IV - Saline Ground Water.

3.2 CLASS IA - PRISTINE GROUND WATER

Class IA ground water has the following characteristics:

A. Total dissolved solids of less than 500 mg/l.

B. No contaminant concentrations that exceed the ground water quality standards listed in Table 1.

3.3 CLASS IB - IRREPLACEABLE GROUND WATER

Class IB ground water is a source of water for a community public drinking water system for which no reliable supply of comparable quality and quantity is available because of economic or institutional constraints.

3.4 CLASS IC - ECOLOGICALLY IMPORTANT GROUND WATER

Class IC ground water is a source of ground water discharge important to the continued existence of wildlife habitat.

3.5 CLASS II - DRINKING WATER QUALITY GROUND WATER

Class II ground water has the following characteristics:

A. Total dissolved solids greater than 500 mg/l and less than 3000 mg/l.

B. No contaminant concentrations that exceed ground water quality standards in Table 1.

3.6 CLASS III - LIMITED USE GROUND WATER

Class III ground water has one or both of the following characteristics:

A. Total dissolved solids greater than 3000 mg/l and less than 10,000 mg/l, or;

B. One or more contaminants that exceed the ground water quality standards listed in Table 1.

3.7 CLASS IV - SALINE GROUND WATER

Class IV ground water has total dissolved solids greater than 10,000 mg/l.

**R317-6-4:** Ground Water Class Protection Levels

4.1 GENERAL

A. Protection levels are ground water pollutant concentration limits, set by ground water class, for the operation of facilities that discharge or would probably discharge to ground water.

B. For the physical characteristics (color, corrosivity, odor, and pH) and radionuclides listed in Table 1, the values listed are the protection levels for all ground water classes.

4.2 CLASS IA PROTECTION LEVELS

A. Class IA ground water will be protected to the maximum extent feasible from degradation due to facilities that discharge or would probably discharge to ground water.

B. The following protection levels will apply:

1. Total dissolved solids may not exceed the lesser of 1.1 times the background value or 500 mg/l.
2. When a contaminant is not present in a detectable amount as a background concentration, the concentration of the pollutant may not exceed the greater of 0.1 times the ground water quality standard value, or the limit of detection.
3. When a contaminant is present in a detectable amount as a background concentration, the concentration of the pollutant may not exceed the greater of 1.1 times the background concentration or 0.1 times the ground water quality standard; however, in no case will the concentration of a pollutant be allowed to exceed the ground water quality standard.

4.3 CLASS IB PROTECTION LEVELS

A. Class IB ground water will be protected as an irreplaceable source of drinking water.

B. The following protection levels will apply:

1. Total dissolved solids may not exceed the lesser of 1.1 times the background value or 2000 mg/l.
2. When a contaminant is not present in a detectable amount as a background concentration, the concentration of the pollutant may not exceed the greater of 0.1 times the ground water quality standard, or the limit of detection.
3. When a contaminant is present in a detectable amount as a background concentration, the concentration of the pollutant may not exceed the greater of 1.1 times the background concentration or 0.1 times the ground water quality standard; however, in no case will the concentration of a pollutant be allowed to exceed the ground water quality standard.

4.4 CLASS IC PROTECTION LEVELS

Class IC ground water will be protected as a source of water for potentially affected wildlife habitat. Limits on increases of total dissolved solids and organic and inorganic chemical compounds will be determined in order to meet applicable surface water standards.

4.5 CLASS II PROTECTION LEVELS

A. Class II ground water will be protected for use as drinking water or other similar beneficial use with conventional treatment prior to use.

B. The following protection levels will apply:

1. Total dissolved solids may not exceed 1.25 times the background value.
2. When a contaminant is not present in a detectable amount as a background concentration, the concentration of the pollutant may not exceed the greater of 0.25 times the ground water quality standard, or the limit of detection.
3. When a contaminant is present in a detectable amount as a background concentration, the concentration of the pollutant may not exceed the greater of 1.25 times the background concentration or 0.25 times the ground water quality standard; however, in no case will the concentration of a pollutant be allowed to exceed the ground water quality standard.

4.6 CLASS III PROTECTION LEVELS

A. Class III ground water will be protected as a potential source of drinking water, after substantial treatment, and as a source of water for industry and agriculture.

B. The following protection levels will apply:

1. Total dissolved solids may not exceed 1.25 times the background concentration level.
2. When a contaminant is not present in a detectable amount as a background concentration, the concentration of the pollutant may not exceed the greater of 0.5 times the ground water quality standard, or the limit of detection.

3. When a contaminant is present in a detectable amount as a background concentration, the concentration of the pollutant may not exceed the greater of 1.5 times the background concentration or 0.5 times the ground water quality standard; however, in no case will the concentration of a pollutant be allowed to exceed the ground water quality standard. If the background concentration exceeds the ground water quality standard no increase will be allowed.

4.7 CLASS IV PROTECTION LEVELS
Protection levels for Class IV ground water will be established to protect human health and the environment.

**R317-6-5: Ground Water Classification for Aquifers.**
5.1 GENERAL
A. When sufficient information is available, entire aquifers or parts thereof may be classified by the Board according to the quality of ground water contained therein and commensurate protection levels will be applied.
B. Ground water sources furnishing water to community drinking water systems with ground water meeting Class IA criteria are classified as Class IA.

5.2 CLASSIFICATION AND RECLASSIFICATION PROCEDURE
A. The Board may initiate classification or reclassification.
B. Any person may petition the Board for classification and reclassification.
C. Boundaries for class areas will be delineated so as to enclose distinct ground water classes as nearly as known facts permit. Boundaries will be based on hydrogeologic properties, existing ground water quality and for Class IB and IC, current use. Parts of an aquifer may be classified differently.
D. The petitioner requesting reclassification will provide sufficient information to determine if reclassification is in the best interest of the beneficial users.
E. A petition for classification or reclassification shall include:
1. factual data supporting the proposed classification;
2. a description of the proposed ground waters to be classified or reclassified;
3. potential contamination sources;
4. ground water flow direction;
5. current beneficial uses of the ground water; and
6. location of all water wells in the area to be classified or reclassified.
F. One or more public hearings will be held to receive comment on classification and reclassification proposals.
G. The Board will determine the disposition of all petitions for classification and reclassification, except as provided in R317-6-5.2.H.
H. Ground water proximate to a facility for which an application for a ground water discharge permit has been made may be classified by the Executive Secretary for purposes of making permitting decisions.

**R317-6-6.1:** DUTY TO APPLY FOR A GROUND WATER DISCHARGE PERMIT
A. No person may construct, install, or operate any new facility or modify an existing or new facility, not permitted by rule under R317-6-6.2, which discharges or would probably result in a discharge of pollutants that may move directly or indirectly into ground water, including, but not limited to land application of wastes; waste storage pits; waste storage piles; landfills and dumps; large feedlots; mining, milling and metallurgical operations, including heap leach facilities; and pits, ponds, and lagoons whether lined or not, without a ground water discharge permit from the Executive Secretary. A ground water discharge permit application should be submitted at least 180 days before the permit is needed.
B. All persons who constructed, modified, installed, or operated any existing facility, not permitted by rule under R317-6-6.2, which discharges or would probably result in a discharge of pollutants that may move directly or indirectly into ground water, including, but not limited to: land application of wastes; waste storage pits; waste storage piles; landfills and dumps; large feedlots; mining, milling and metallurgical operations, including heap leach facilities; and pits, ponds, and lagoons whether lined or not, must have submitted a notification of the nature and location of the discharge to the Executive Secretary before February 10, 1990 and must submit an application for a ground water discharge permit within one year after receipt of written notice from the Executive Secretary that a ground water discharge permit is required.

**R317-6-6.2(A), (A)(1), and (A)(25):** Except as provided in R317-6-6.2.C, the following facilities are considered to be permitted by rule and are not required to obtain a discharge permit under R317-6-6.1 or comply with R317-6-6.3 through R317-6-6.7, R317- 6-6.9 through R317-6-6.11, R317-6-6.13, R317-6-6.16, R317-6-6 17 and R317-6-6.18:

1. facilities with effluent or leachate which has been demonstrated to the satisfaction of the Executive Secretary to conform and will not deviate from the applicable class TDS limits, ground water quality standards, protection levels or other permit limits and which does not contain any contaminant that may present a threat to human health, the environment or its potential beneficial uses of the ground water. The Executive Secretary may require samples to be analyzed for the presence of contaminants before the effluent or leachate discharges directly or indirectly into ground water. If the discharge is by seepage through natural or altered natural materials, the Executive Secretary may require samples of the solution be analyzed for the presence of pollutants before or after seepage;

...

25. facilities and modifications thereto which the Executive Secretary determines after a review of the application will have a de minimis actual or potential effect on ground water quality.

**R317-6-6.3**: APPLICATION REQUIREMENTS FOR A GROUND WATER DISCHARGE PERMIT

Unless otherwise determined by the Executive Secretary, the application for a permit to discharge wastes or pollutants to ground water shall include the following complete information:

A. The name and address of the applicant and the name and address of the owner of the facility if different than the applicant. A corporate application must be signed by an officer of the corporation. The name and address of the contact, if different than above, and telephone numbers for all listed names shall be included.

B. The legal location of the facility by county, quarter-quarter section, township, and range.

C. The name of the facility and the type of facility, including the expected facility life.

D. A plat map showing all water wells, including the status and use of each well, topography, springs, water bodies, drainages, and man-made structures within a one-mile radius of the discharge. The plat map must also show the location and depth of existing or proposed wells to be used for monitoring ground water quality.

E. Geologic, hydrologic, and agricultural description of the geographic area within a one-mile radius of the point of discharge, including soil types, aquifers, ground water flow direction, ground water quality, aquifer material, and well logs.

F. The type, source, and chemical, physical, radiological, and toxic characteristics of the effluent or leachate to be discharged; the average and maximum daily amount of effluent or leachate discharged (gpd), the discharge rate (gpm), and the expected concentrations of any pollutant (mg/l) in each discharge or combination of discharges. If more than one discharge point is used, information for each point must be given separately.

G. Information which shows that the discharge can be controlled and will not migrate into or adversely affect the quality of any other waters of the state, including the applicable surface water quality standards, that the discharge is compatible with the receiving ground water, and that the discharge will comply with the applicable class TDS limits, ground water quality standards, class protection levels or an alternate concentration limit proposed by the facility.

H. For areas where the ground water has not been classified by the Board, information on the quality of the receiving ground water sufficient to determine the applicable protection levels.

I. The proposed monitoring plan, which includes a description, where appropriate, of the following:

1. ground water monitoring to determine ground water flow direction and gradient, background quality at the site, and the quality of ground water at the compliance monitoring point;
2. installation, use and maintenance of monitoring devices;
3. description of the compliance monitoring area defined by the compliance monitoring points including the dimensions and hydrologic and geologic data used to determine the dimensions;
4. monitoring of the vadose zone;
5. measures to prevent ground water contamination after the cessation of operation, including post- operational monitoring;
6. monitoring well construction and ground water sampling which conform to A Guide to the Selection of Materials for Monitoring Well Construction and Ground Water Sampling, (1983) and RCRA Ground Water Monitoring Technical Enforcement Guidance Manual (1986), unless otherwise specified by the Executive Secretary;
7. description and justification of parameters to be monitored.

J. The plans and specifications relating to construction, modification, and operation of discharge systems.

K. The description of the ground water most likely to be affected by the discharge, including water quality information of the receiving ground water prior to discharge, a description of the aquifer in which the ground water occurs, the depth to the ground water, the saturated thickness, flow direction, porosity, hydraulic conductivity, and flow systems characteristics.

L. The compliance sampling plan which includes, where appropriate, provisions for sampling of effluent and for flow monitoring in order to determine the volume and chemistry of the discharge onto or below the surface of the ground and a plan for sampling compliance monitoring points and appropriate nearby water wells. Sampling and analytical methods proposed in the application must conform with the most appropriate methods specified in the following references unless otherwise specified by the Executive Secretary:
1. Standard Methods for the Examination of Water and Wastewater, eighteenth edition, 1992; Library of Congress catalogue number: ISBN: 0-87553-207-1.
2. E.P.A. Methods, Methods for Chemical Analysis of Water and Wastes, 1983; Stock Number EPA-600/4- 79-020.
3. Techniques of Water Resource Investigations of the U.S. Geological Survey, (1982); Book 5, Chapter A3.
4. Monitoring requirements in 40 CFR parts 141 and 142, 1991 ed., Primary Drinking Water Regulations and 40 CFR parts 264 and 270, 1991 ed.
5. National Handbook of Recommended Methods for Water-Data Acquisition, GSA-GS edition; Book 85 AD- 2777, U.S. Government Printing Office Stock Number 024-001-03489-1.
6. Manual of Analytical Methods for the Analysis of Pesticide Residues in Humans and Environmental Samples, 1980; Stock Number EPA-600/8-80-038, U.S. Environmental Protection Agency.
M. A description of the flooding potential of the discharge site, including the 100-year flood plain, and any applicable flood protection measures.
N. Contingency plan for regaining and maintaining compliance with the permit limits and for reestablishing best available technology as defined in the permit.
O. Methods and procedures for inspections of the facility operations and for detecting failure of the system.
P. For any existing facility, a corrective action plan or identification of other response measures to be taken to remedy any violation of applicable ground water quality standards, class TDS limits or permit limit established under R317-6-6.4E. which has resulted from discharges occurring prior to issuance of a ground water discharge permit.
Q. Other information required by the Executive Secretary.

**R317-6-6.4**: ISSUANCE OF DISCHARGE PERMIT
A. The Executive Secretary may issue a ground water discharge permit for a new facility if the Executive Secretary determines, after reviewing the information provided under R317-6-6.3, that:
1. the applicant demonstrates that the applicable class TDS limits, ground water quality standards protection levels, and permit limits established under R317-6-6.4E will be met;
2. the monitoring plan, sampling and reporting requirements are adequate to determine compliance with applicable requirements;
3. the applicant is using best available technology to minimize the discharge of any pollutant; and
4. there is no impairment of present and future beneficial uses of the ground water.

B. The Board may approve an alternate concentration limit for a new facility if:
1. The applicant submits a petition for an alternate concentration limit showing the extent to which the discharge will exceed the applicable class TDS limits, ground water standards or applicable protection levels and demonstrates that:
a. the facility is to be located in an area of Class III ground water;
b. the discharge plan incorporates the use of best available technology;
c. the alternate concentration limit is justified based on substantial overriding social and economic benefits; and,
d. the discharge would pose no threat to human health and the environment.
2. One or more public hearings have been held by the Board in nearby communities to solicit comment.

C. The Executive Secretary may issue a ground water discharge permit for an existing facility provided:
1. the applicant demonstrates that the applicable class TDS limits, ground water quality standards and protection levels will be met;
2. the monitoring plan, sampling and reporting requirements are adequate to determine compliance with applicable requirements;
3. the applicant utilizes treatment and discharge minimization technology commensurate with plant process design capability and similar or equivalent to that utilized by facilities that produce similar products or services with similar production process technology; and,
4. there is no current or anticipated impairment of present and future beneficial uses of the ground water.

D. The Board may approve an alternate concentration limit for a pollutant in ground water at an existing facility or facility permitted by rule under R317-6-6.2 if the applicant for a ground water discharge permit shows the extent the discharge exceeds the applicable class TDS limits, ground water quality standards and applicable protection levels that correspond to the otherwise applicable ground water quality standards and demonstrates that:
1. steps are being taken to correct the source of contamination, including a program and timetable for completion;
2. the pollution poses no threat to human health and the environment; and
3. the alternate concentration limit is justified based on overriding social and economic benefits.

E. An alternate concentration limit, once adopted by the Board under R317-6-6.4B or R317-6-6.4D, shall be the pertinent permit limit.

F. A facility permitted under this provision shall meet applicable class TDS limits, ground water quality standards, protection levels and permit limits.

G. The Board may modify a permit for a new facility to reflect standards adopted as part of corrective action.

**R317-6-6.5**: NOTICE OF INTENT TO ISSUE A GROUND WATER DISCHARGE PERMIT
The Executive Secretary shall publish a notice of intent to approve in a newspaper in the affected area and shall allow 30 days in which interested persons may comment to the Board. Final action will be taken by the Executive Secretary following the 30-day comment period.

**R317-6-6.6**: PERMIT TERM
A. The ground water discharge permit term will run for 5 years from the date of issuance. Permits may be renewed for 5-year periods or extended for a period to be determined by the Executive Secretary but not to exceed 5 years.

B. In the event that new ground water quality standards are adopted by the Board, permits may be reopened to extend the terms of the permit or to include pollutants covered by new standards. The holder of a permit may apply for a variance under the conditions outlined in R317-6-6.4.D.

**R317-6-6.7**: GROUND WATER DISCHARGE PERMIT RENEWAL
The permittee for a facility with a ground water discharge permit must apply for a renewal or extension for a ground water discharge permit at least 180 days prior to the expiration of the existing permit. If a permit expires before an application for renewal or extension is acted upon by the Executive Secretary, the permit will continue in effect until it is renewed, extended or denied.

**R317-6-6.9: Permit Compliance Monitoring**
A. Ground Water Monitoring
The Executive Secretary may include in a ground water discharge permit requirements for ground water monitoring, and may specify compliance monitoring points where the applicable class TDS limits, ground water quality standards, protection levels or other permit limits are to be met. The Executive Secretary will determine the location of the compliance monitoring point based upon the hydrology, type of pollutants, and other factors that may affect the ground water quality. The distance to the compliance monitoring points must be as close as practicable to the point of discharge. The compliance monitoring point shall not be beyond the property boundaries of the permitted facility without written agreement of the affected property owners and approval by the Executive Secretary.

B. Performance Monitoring
The Executive Secretary may include in a ground water discharge permit requirements for monitoring performance of best available technology standards.

**R317-6-6.10**: BACKGROUND WATER QUALITY DETERMINATION
A. Background water quality contaminant concentrations shall be determined and specified in the ground water discharge permit. The determination of background concentration shall take into account any degradation.

B. Background water quality contaminant concentrations may be determined from existing information or from data collected by the permit applicant. Existing information shall be used, if the permit applicant demonstrates that the quality of the information and its means of collection are adequate to determine background water quality. If existing information is not adequate to determine background water quality, the permit applicant shall submit a plan to determine background water quality to the Executive Secretary for approval prior to data collection. One or more up- gradient, lateral hydraulically equivalent point, or other monitoring wells as approved by the Executive Secretary may be required for each potential discharge site.

C. After a permit has been issued, permittee shall continue to monitor background water quality contaminant concentrations in order to determine natural fluctuations in concentrations. Applicable up-gradient, and on- site ground water monitoring data shall be included in the ground water quality permit monitoring report.

**R317-6-6.15 and 6.15(A):** CORRECTIVE ACTION
It is the intent of the Board that the provisions of these regulations should be considered when making decisions under any state or federal superfund action; however, the protection levels are not intended to be considered as applicable, relevant or appropriate clean-up standards under such other regulatory programs.

A. Application of R317-6-6.15
1. Generally - R317-6-6.15 shall apply to any person who discharges pollutants into ground water in violation of Section 19-5-107, or who places or causes to be placed any wastes in a location where there is probable cause to believe they will cause pollution of ground water in violation of Section 19-5-107.
2. Corrective Action shall include, except as otherwise provided in R317-6-6.15, preparation of a Contamination Investigation and preparation and implementation of a Corrective Action Plan.
3. The procedural provisions of R-317-6-6.15 shall not apply to any facility where a corrective or remedial action for ground water contamination, that the Executive Secretary determines meets the substantive standards of this rule, has been initiated under any other state or federal program. Corrective or remedial action undertaken under the programs specified in Table 2 are considered to meet the substantive standards of this rule unless otherwise determined by the Executive Secretary.

TABLE 2
PROGRAM
Leaking Underground Storage Tank, Sections 19-6-401, et seq.
Federal Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. Sections 9601, et seq.
Hazardous Waste Mitigation Act, Sections 19-6-301 et seq
Utah Solid and Hazardous Waste Act, Sections 19-6-101 et seq.

**R317-6-6.15(B):** Notification and Interim Action
1. Notification - A person who spills or discharges any oil or other substance which may cause pollution of ground waters in violation of Section 19-5-107 shall notify the Executive Secretary within 24 hours of the spill or discharge. A written notification shall be submitted to the Executive Secretary within five days after the spill or discharge.
2. Interim Actions - A person is encouraged to take immediate, interim action without following the steps outlined in R317-6-6.15 if such action is required to control a source of pollutants. Interim action is also encouraged if required to protect public safety, public health and welfare and the environment, or to prevent further contamination that would result in costlier clean-up. Such interim actions should include source abatement and control, neutralization, or other actions as appropriate. A person that has taken these actions shall remain subject to R317-6-6.15 after the interim actions are completed unless he demonstrates that:
a. no pollutants have been discharged into ground water in violation of 19-5-107; and
b. no wastes remain in a location where there is probable cause to believe they will cause pollution of ground water in violation of 19-5-107.

**R317-6-6.15(C):** Contamination Investigation and Corrective Action Plan - General
1. The Executive Secretary may require a person that is subject to R317-6-6.15 to submit for the Executive Secretary's approval a Contamination Investigation and Corrective Action Plan, and may require implementation of an approved Corrective Action Plan. A person subject to this rule who has been notified that the Executive Secretary is exercising his or her authority under R317-6-6.15 to require submission of a Contamination Investigation and Corrective Action Plan, shall, within 30 days of that notification, submit to the

Executive Secretary a proposed schedule for those submissions, which may include different deadlines for different elements of the Investigation and Plan. The Executive Secretary may accept, reject, or modify the proposed schedule.
2. The Contamination Investigation or the Corrective Action Plan may, in order to meet the requirements of this Part, incorporate by reference information already provided to the Executive Secretary in the Contingency Plan or other document.
3. The requirements for a Contamination Investigation and a Corrective Action Plan specified in R317- 6-6.15.D are comprehensive. The requirements are intended to be applied with flexibility, and persons subject to this rule are encouraged to contact the Executive Secretary's staff to assure its efficient application on a site-specific basis.
4. The Executive Secretary may waive any or all Contamination Investigation and Corrective Action Plan requirements where the person subject to this rule demonstrates that the information that would otherwise be required is not necessary to the Executive Secretary's evaluation of the Contamination Investigation or Corrective Action Plan. Requests for waiver shall be submitted to the Executive Secretary as part of the Contamination Investigation or Corrective Action Plan, or may be submitted in advance of those reports

**R317-6-6.15(D):** Contamination Investigation and Corrective Action Plan - Requirements
1. Contamination Investigation - The contamination investigation shall include a characterization of pollution, a characterization of the facility, a data report, and, if the Corrective Action Plan proposes standards under R317-6-6.15.F.2. or Alternate Corrective Action Concentration Limits higher than the ground water quality standards, an endangerment assessment.
a. The characterization of pollution shall include a description of:
(1) The amount, form, concentration, toxicity, environmental fate and transport, and other significant characteristics of substances present, for both ground water contaminants and any contributing surficial contaminants;
(2) The areal and vertical extent of the contaminant concentration, distribution and chemical make- up; and
(3) The extent to which contaminant substances have migrated and are expected to migrate.
b. The characterization of the facility shall include descriptions of:
(1) Contaminant substance mixtures present and media of occurrence;
(2) Hydrogeologic conditions underlying and, upgradient and downgradient of the facility;
(3) Surface waters in the area;
(4) Climatologic and meteorologic conditions in the area of the facility; and
(5) Type, location and description of possible sources of the pollution at the facility;
(6) Groundwater withdrawals, pumpage rates, and usage within a 2-mile radius.
c. The report of data used and data gaps shall include:
(1) Data packages including quality assurance and quality control reports;
(2) A description of the data used in the report; and
(3) A description of any data gaps encountered, how those gaps affect the analysis and any plans to fill those gaps.
d. The endangerment assessment shall include descriptions of any risk evaluation necessary to support a proposal for a standard under R317-6-6.15.F.2 or for an Alternate Corrective Action Concentration Limit.
e. The Contamination Investigation shall include such other information as the Executive Secretary requires.
2. Proposed Corrective Action Plan
The proposed Corrective Action Plan shall include an explanation of the construction and operation of the proposed Corrective Action, addressing the factors to be considered by the Executive Secretary as specified in R317- 6-6.15.E. and shall include such other information as the Executive Secretary requires. It shall also include a proposed schedule for completion.

**R317-6-6.15(E):** Approval of the Corrective Action Plan
After public notice in a newspaper in the affected area and a 30-day period for opportunity for public review and comment, the Executive Secretary shall issue an order approving, disapproving, or modifying the proposed Corrective Action Plan. The Executive Secretary shall consider the following factors and criteria in making that decision:
1. Completeness and Accuracy of Corrective Action Plan.
The Executive Secretary shall consider the completeness and accuracy of the Corrective Action Plan and of the information upon which it relies.
2. Action Protective of Public Health and the Environment

a. The Corrective Action shall be protective of the public health and the environment.
b. Impacts as a result of any off-site activities shall be considered under this criterion (e.g., the transport and disposition of contaminated materials at an off-site facility).
3. Action Meets Concentration Limits
The Corrective Action shall meet Corrective Action Concentration Limits specified in R317-6-6.15.F, except as provided in R317-6-6.15.G.
4. Action Produces a Permanent Effect
a. The Corrective Action shall produce a permanent effect.
b. If the Corrective Action Plan provides that any potential sources of pollutants are to be controlled in place, any cap or other method of source control shall be designed so that the discharge from the source following corrective action achieves ground water quality standards or, if approved by the Board, alternate corrective action concentration limits (ACACLs). For purposes of this paragraph, sources of pollutants are controlled "in place" even though they are moved within the facility boundaries provided that they are not moved to areas with unaffected ground water.
5. Action May Use Other Additional Measures
The Executive Secretary may consider whether additional measures should be included in the Plan to better assure that the criteria and factors specified in R317-6-6.15.E are met. Such measures may include:
a. Requiring long-term ground water or other monitoring;
b. Providing environmental hazard notices or other security measures;
c. Capping of sources of ground water contamination to avoid infiltration of precipitation;
d. Requiring long-term operation and maintenance of all portions of the Corrective Action; and
e. Periodic review to determine whether the Corrective Action is protective of public health and the environment.

**R317-6-6.15(F)** Corrective Action Concentration Limits
1. Contaminants with specified levels
Corrective Actions shall achieve ground water quality standards or, where applicable, alternate corrective action concentration limits (ACACLs).
2. Contaminants without specified levels
For contaminants for which no ground water quality standard has been established, the proposed Corrective Action Plan shall include proposed Corrective Action Concentration Limits. These levels shall be approved, disapproved or modified by the Executive Secretary after considering U.S. Environmental Protection Agency maximum contaminant level goals, health advisories, risk-based contaminant levels or standards established by other regulatory agencies and other relevant information.

**R317-6-6.15(G):** Alternate Corrective Action Concentration Limits
An Alternate Corrective Action Concentration Limit that is higher or lower than the Corrective Action Concentration Limits specified in R317-6-6.15.F may be required as provided in the following:
1. Higher Alternate Corrective Action Concentration Limits
A person submitting a proposed Corrective Action Plan may request approval by the Board of an Alternate Corrective Action Concentration Limit higher than the Corrective Action Concentration Limit specified in R317-6- 6.15.F. The proposed limit shall be protective of human health, and the environment, and shall utilize best available technology. The Corrective Action Plan shall include the following information in support of this request:
a. The potential for release and migration of any contaminant substances or treatment residuals that might remain after Corrective Action in concentrations higher than Corrective Action Concentration Limits;
b. An evaluation of residual risks, in terms of amounts and concentrations of contaminant substances remaining following implementation of the Corrective Action options evaluated, including consideration of the persistence, toxicity, mobility, and propensity to bioaccumulate such contaminants substances and their constituents; and
c. Any other information necessary to determine whether the conditions of R317-6-6 15.G have been met.
2. Lower Alternate Corrective Action Concentration Limits
The Board may require use of an Alternate Corrective Action Concentration Limit that is lower than the Corrective Action Concentration Limit specified in R317-6-6.15.F if necessary to protect human health or the environment. Any person requesting that the Board consider requiring a lower Alternate Corrective Action Concentration Limit shall provide supporting information as described in R317-6-6.15.G.3.
3. Protective of human health and the environment

The Alternate Corrective Action Concentration Limit must be protective of human health and the environment. In making this determination, the Board may consider:
a. Information presented in the Contamination Investigation;
b. Other relevant cleanup or health standards, criteria, or guidance;
c. Relevant and reasonably available scientific information;
d. Any additional information relevant to the protectiveness of a Corrective Action; and
e. The impact of additional proposed measures, such as those described in R317-6-6.15.E.5.
4. Good cause
An Alternate Corrective Action Concentration Limit shall not be granted without good cause.
a. The Board may consider the factors specified in R317-6-6.15.E in determining whether there is good cause.
b. The Board may also consider whether the proposed remedy is cost-effective in determining whether there is good cause. Costs that may be considered include but are not limited to:
(1) Capital costs;
(2) Operation and maintenance costs;
(3) Costs of periodic reviews, where required;
(4) Net present value of capital and operation and maintenance costs;
(5) Potential future remedial action costs; and
(6) Loss of resource value.
5. Conservative
An Alternate Corrective Action Concentration Limit that is higher than the Corrective Action Concentration Limits specified in R317-6-6.15.F must be conservative. The Board may consider the concentration level that can be achieved using best available technology if attainment of the Corrective Action Concentration Limit is not technologically achievable.
6. Relation to background and existing conditions
a. The Board may consider the relationship between the Corrective Action Concentration Limits and background concentration limits in considering whether an Alternate Corrective Action Concentration Limit is appropriate.
b. No Alternate Corrective Action Concentration Limit higher than existing ground water contamination levels or ground water contamination levels projected to result from existing conditions will be granted.

**R317-6-6.16(A) and (B)**: OUT-OF-COMPLIANCE STATUS
A. Accelerated Monitoring for Probable Out-of-Compliance Status
If the concentration of a pollutant in any compliance monitoring sample exceeds an applicable permit limit, the facility shall:
1. Notify the Executive Secretary in writing within 30 days of receipt of data;
2. Initiate monthly sampling, unless the Executive Secretary determines that other periodic sampling is appropriate, for a period of two months or until the compliance status of the facility can be determined.

B. Violation of Permit Limits
Out-of-compliance status exists when:
1. two consecutive samples from a compliance monitoring point exceed:
a. one or more permit limits; and
b. the mean ground water pollutant concentration for that pollutant by two standard deviations (the standard deviation and mean being calculated using values for the ground water pollutant at that compliance monitoring point); or
2. the concentration value of any pollutant in two or more consecutive samples is statistically significantly higher than the applicable permit limit. The statistical significance shall be determined using the statistical methods described in Statistical Methods for Evaluating Ground Water Monitoring Data from Hazardous Waste Facilities, Vol. 53, No. 196 of the Federal Register, Oct. 11, 1988.

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