



State of Utah

SPENCER J. COX  
Governor

DEIDRE HENDERSON  
Lieutenant Governor

Department of  
Environmental Quality

Tim Davis  
Executive Director

DIVISION OF WASTE MANAGEMENT  
AND RADIATION CONTROL

Ted H. Sonnenburg, P.E., L.E.H.S.  
Director

A meeting of the Utah Waste Management and Radiation Control Board has been scheduled for April 9, 2026 at 1:30 p.m. at the Utah Department of Environmental Quality, (Multi-Agency State Office Building) Conference Room #1015, 195 North 1950 West, SLC.

Board members and interested individuals may participate electronically/telephonically.

Join via the Internet: [meet.google.com/gad-sxsd-uvs](https://meet.google.com/gad-sxsd-uvs)

Join via the Phone: (US) +1 978-593-3748 PIN: 902 672 356#

A Board Working Meeting to discuss the progress on the Utah Solid Waste Management Plan will be held prior to the Board meeting from 12:00 p.m. – 1:00 p.m.

Conference Rooms 1019 A/B (1<sup>st</sup> Floor)

**This in-person working lunch meeting is open to the public. No virtual component will be provided. A recording of the working meeting will be posted on the Utah Public Notice Website after the meeting.**

**AGENDA**

- I. Call to Order and Roll Call.
- II. Public Comments on Agenda Items.
- III. Declarations of Conflict of Interest.
- IV. Approval of meeting minutes for March 12, 2026, Board meeting..... Tab 1  
**(Board Action Item).**
- V. Petroleum Storage Tanks Update..... Tab 2
- VI. Administrative Rules ..... Tab 3
  - A. Approval from the Board to proceed with final adoption of the proposed changes to Utah Administrative Code R315-101 of the Utah Solid and Hazardous Waste Rules  
**(Board Action Item).**

VII. Low-Level Radioactive Waste..... Tab 4

- A. EnergySolutions request for one time site-specific treatment variance from the Utah Hazardous Waste Management Rules. EnergySolutions seeks authorization to receive a variance from Utah Administrative Codes R315-268-40 and R315-268-45 for the direct macroencapsulation treatment of approximately 1200 lbs. of lithium and lithium-ion batteries (**Information Item**).

VIII. Director’s Report.

IX. Executive Director’s Report.

X. Other Business.

- A. Miscellaneous Information Items.
- B. Scheduling of next Board meeting (May 14, 2026).

XI. Adjourn.

In compliance with the Americans with Disabilities Act, individuals with special needs (including auxiliary communicative aids and services) should contact LeAnn Johnson, Office of Human Resources at 385-226-4881, Telecommunications Relay Service 711, or by email at leannjohnson@utah.gov.

**Utah Waste Management and Radiation Control Board Meeting Minutes**  
**Utah Department of Environmental Quality**  
**Multi-Agency State Office Building (Conf. Room #1015)**  
**195 North 1950 West, SLC**  
**March 12, 2026**  
**1:30 p.m.**

**Board Members Participating at Anchor Location:** Brett Mickelson (Chair), Dennis Riding (Vice-Chair), Tim Davis, Jeremy Hawk, Dr. Steve McIff, Vern Rogers, Shane Whitney

**Board Members Participating Virtually:** Dr. Richard Codell, Dr. Danielle Endres, Scott Wardle

**Board Members Excused:** Mark Franc, Neil Schwendiman

**UDEQ Staff Members Participating at Anchor Location:** Morgan Atkinson, Brenden Catt, Brandon Davis, Chris Howell, Jalynn Knudsen, Arlene Lovato, Mike Pecorelli, Raymond Wixom

**Others Attending at Anchor Location:** None.

**Other UDEQ employees and interested members of the public also participated either virtually or telephonically.**

**This meeting was recorded and an unedited audio of this meeting can be accessed at:**  
<https://www.utah.gov/pmn/files/1404605.mp3>

**I. Call to Order and Roll Call.**

Chairman Mickelson called the meeting to order at 1:30 p.m. Roll call of Board members was conducted; see above.

**II. Public Comments on Agenda Items - None.**

**III. Declaration of Conflict of Interest - None.**

**IV. Approval of meeting minutes for the February 12, 2026, Board Meeting (Board Action Item).**

**It was moved by Dennis Riding and seconded by Dr. Richard Codell and UNANIMOUSLY CARRIED to approve the February 12, 2026, Board meeting minutes.**

**V. Petroleum Storage Tanks Update.**

Morgan Atkinson, Petroleum Storage Tank Branch Manager, with the Division of Environmental Response and Remediation (DERR), informed the Board that the cash balance of the Petroleum Storage Tank (PST) Enterprise Fund (Fund) for the end of February 2026, was \$39,585,828.00. The DERR continues to monitor the balance of the PST Enterprise Fund closely to ensure sufficient cash is available to cover qualified claims for releases.

Mr. Atkinson also provided a legislative update. The DERR tracked the following three bills, among others, during the recent session.

House Bill 388, Public Health Hazard Amendments, sponsored by Representative Lisa Shepherd, would have allowed for law enforcement to report lodging establishments to local health departments if they are suspected of being contaminated with methamphetamine or fentanyl. This bill did not pass.

Senate Bill 234, 2nd Substitute, Rulemaking Amendments, sponsored by Senator Brady Brammer, places some restrictions on state agencies from creating environmental health or waste management rules that are more stringent than federal rules. Rules from Title 19 were exempted by the second substitute. This bill passed.

House Bill 437, Environmental Permitting Amendments, sponsored by Representative David Shallenberger, allows the Department of Environmental Quality and the Division of Oil, Gas and Mining to create a program in order to expedite the review of environmental permit applications. This bill passed.

Dennis Riding asked about the ceiling of the PST Fund. Mr. Atkinson reported that during the 2025 legislative session, the ceiling of the PST Fund was raised to 60 million dollars.

Additionally, there was a question on an error field in the PST Summary; Mr. Atkinson said he would look into it and provide information.

There were no additional comments or questions.

## **VI. Administrative Rules.**

### **A. Five-Year Review of Utah Administrative Code Rules R313-12, 14, 16, 17, 18, 19, 22, 25, 28, 32, 36, and 70 (Information Item).**

Brandon Davis, X-Ray and Technical Support Section Manager in the Division of Waste Management and Radiation Control (Division), informed the Board that Utah Administrative Rulemaking Act requires state agencies to review each of their administrative rules within five years of the rule's original effective date, or the last five-year review. The rules identified above are due for a five-year review to be filed with the Office of Administrative Rules.

As part of the formal rulemaking processes, during the past five years, a total of 24 public comment periods were opened, and only one set of public comments were received, which were addressed at the conclusion of the June 2024 public comment period.

This is an informational item only to keep the Board informed of the Five-Year Reviews that have been conducted and are being submitted to the Office of Administrative Rules.

Vern Rogers noted that since the rules are being presented specifically for a five-year review, the Division is not proposing any rule changes at this time.

Mr. Davis confirmed this statement, clarifying that any substantive or non-substantive rule changes would require the formal rulemaking processes. There are currently no grammatical or substantive changes being made to these rules.

There were no additional comments or questions.

## VII. X-Ray Program.

### A. **Approval of Mammography Imaging Medical Physicist (MIMP) in accordance with UCA 19-3-103.1 (2)(c) of the Utah Code Annotated (Board Action Item).**

Brandon Davis, X-Ray and Technical Support Section Manager in the Division of Waste Management and Radiation Control (Division), informed the Board that the Division received one new application for an individual seeking certification as a Mammography Imaging Medical Physicist, referred to as a MIMP.

These physicists perform radiation surveys and evaluate the quality control programs of the facilities in Utah that provide mammography examinations. Initial MIMP certification must be approved by the Board as required by Utah Code Section 19-3-103.1(2)(c). The Division staff have reviewed the application of Kenneth R. Harper, MS, DABR, and has determined that the applicant meets the requirements detailed in Utah Administrative Code R313-28-140.

The Director of the Division recommends the Board issue a certificate of approval to the applicant reviewed and presented to the Board.

There were no additional comments or questions.

**It was moved by Shane Whitney and seconded by Dr. Steve McIff and UNANIMOUSLY CARRIED to approve Kenneth R. Harper, to be certified as Mammography Imaging Medical Physicist (MIMP) in accordance with Utah Code Section 19-3-103.1(2)(c).**

### B. **Exemption Request for Mammography Imaging Medical Physicist (MIMP) from Utah Administrative Code R313-28-140(2)(a) (Board Action Item).**

Brandon Davis informed the Board that the Division received a request from Saleh Hamdan, PhD seeking certification as a Mammography Imaging Medical Physicist (MIMP). Dr. Hamdan is seeking an exemption from Utah Administrative Code R313-28-140(2)(a), which requires applicants to be certified by the American Board of Radiology in Radiological Physics or Diagnostic Radiological Physics.

Dr. Hamdan completed his residency at the Yale University School of Medicine in June of 2025. He has passed Part 1 and Part II of the American Board of Radiology (ABR) exams and is scheduled to take the final certifying exam in the fall. Currently Dr. Hamdan meets all federal requirements for a qualified medical physicist under the Mammography Quality Standards Act (MQSA) pursuant to 21 CFR 900.12. The Division staff have reviewed the application of Dr. Hamdan and has determined that he has met all other state requirements.

The Director of the Division recommends the Board issue a certificate of approval to Dr. Hamdan to expire on March 31, 2027. This timeline allows the applicant to complete their final Part III exam for ABR certification while still serving the state's needs with the requirement that he provides evidence of full credentials upon renewal at that time in 2027.

Dennis Riding requested clarification on the specific nature of Dr. Hamdan's request for an exemption.

Mr. Davis explained that state rules require applicants to be certified by the American Board of Radiology in radiologic physics or diagnostic radiology physics. While Dr. Hamdan has passed the first two parts of the three-part certification exam, the final exam is only offered a few times a year and he is not scheduled to take that exam until this fall.

Mr. Riding noted that Dr. Hamdan is seeking a temporary certification contingent upon passing the final exam; Mr. Davis confirmed that statement.

Danielle Endres inquired if the Division has previously granted such exemptions and if there are any potential negative consequences with the Board approving the exemption.

Mr. Davis noted that to his knowledge, this would be the first time that an exemption of this kind would be granted. Mr. Davis informed the Board that as Dr. Hamdan performs his reviews and submits his paperwork, Division staff will review all submissions to ensure accuracy. Noting that due to the exemption, processes will be handled differently than standard procedures.

Jeremy Hawk mentioned that he has been a MIMP since 2010; however, he did not receive Board certification until 2023, as the Board's approval of MIMPs is a relatively new rule requirement.

There were no additional comments or questions.

**It was moved by Scott Wardle and seconded by Jeremy Hawk and UNANIMOUSLY CARRIED to approve the exemption request from Utah Administrative Code R313-28-140(2)(a) for Saleh Hamdan, PhD to be certification as a Mammography Imaging Medical Physicist (MIMP), to expire on March 31, 2027.**

#### **VIII. Director's Report/Legislative Update.**

Jalynn Knudsen, Assistant Director in the Division of Waste Management and Radiation Control, provided a legislative update to the Board.

Assistant Director Knudsen informed the Board that during the 2026 Utah Legislative Session, over 1,015 bills were proposed and 541 passed. The Division tracked 51 of these bills for a potential impact, 22 of which ultimately passed.

Assistant Director Knudsen highlighted the following legislative bills that passed that will impact the Division.

House Bill 37, Used Oil Management Act Amendments, sponsored by Representative Chew. This bill increases the recycling fee on new oil sales per quart. Furthermore, it removed the fee from statute to allow the Division the ability to modify the fee in the future.

House Bill 323, Solar Panel Disposal Amendments, sponsored by Representative Collin Jack. Assistant Director Knudsen informed the Board that this legislation will require significant efforts from the Division, as the Division is tasked with completing a study and creating a program for the testing and disposal of solar panel waste over the next few years. The study will begin shortly, and the first report to the legislature is due by November of this year. The final study report is due before July 2027. The findings of that study will assist the Division in the creation of the new program for Solar Panel disposal. The Division will continue to provide updates to the Board as this evolves.

Senate Bill 146, Industrial Byproduct Amendments, sponsored by Senator Grover. The bill amends the definition of "Industrial Byproduct," allowing its use in any project *if* the Director of the Division of Waste Management and Radiation Control approves a reuse application. It was previously restricted to UDOT use for roads, etc.

Senate Bill 12, Sunset and Repeal Date Amendments, sponsored by Senator Weiler. This bill repeals the sunset for lead acid battery disposal and makes it permanent.

House Bill 78, Nuclear Regulatory Amendments, sponsored by Representative Albrecht. Assistant Director Knudsen stated this legislation will have a big impact for the Division. The bill creates a new Nuclear Energy Regulatory Office within the Division of Waste Management and Radiation Control, granting the Division rulemaking authority, the ability to collect fees for licensing and oversight, and directs the Division to pursue expanded "Agreement State" status with the U.S. Nuclear Regulatory Commission. Assistant Director Knudsen commented the Division will work with other regulatory agencies to build the regulatory program for this new office.

Danielle Endres requested additional information regarding House Bill 78. Specifically regarding the new office being created and the reasoning why the new office is being created. Assistant Director Knudsen responded that in alignment with the Governor's push for nuclear energy in the State of Utah, this legislation creates the Nuclear Energy Regulatory Office within the Division. This legislation will give the Division rulemaking authority, the ability to collect fees, and licensing and oversight. Additionally, the bill directs the state to pursue expanded agreement state status with the U.S. Nuclear Regulatory Commission.

Danielle Endres inquired about the impact these changes will have on the Board. Specifically, whether the Board will remain involved in these processes or if these changes will remove certain existing Board responsibilities.

Assistant Director Knudsen clarified that the new legislation does not take away any authority the Board currently has. The legislation gives the Division rulemaking authority, so any proposed rules will come to the Board for approval.

Executive Director Davis further stated that House Bill 78 directs the Division to create the Nuclear Energy Regulatory Office (NERO) and establishes ongoing funding for the NERO. This legislation allows the State of Utah to develop expertise on nuclear regulatory issues for the first time, that the State has not had expertise on in the past. To that end, the Division has already hired its first nuclear engineer, who has a safety background and is currently supported by temporary funding. Additionally, the bill consolidates work related to energy fuels and EnergySolutions under a single Assistant Director within the creation of the new NERO.

Executive Director Davis reiterated that rulemaking authority will remain with the Board. This authority enables the Board and the State of Utah to establish rules for additional parts of the nuclear fuel cycle that are consistent with the Atomic Energy Act.

Executive Director Davis also shared several key updates regarding the nuclear fuel cycle and our state's nuclear initiatives.

Executive Director Davis briefly discussed the rapid national and state-level efforts to reinvigorate safe nuclear power. Executive Director Davis commented to support this growth, the State of Utah and the UDEQ is focused on expanding its internal expertise to ensure we operate efficiently and most importantly safely.

Dennis Riding inquired about potential changes to the composition of the Board, specifically regarding the addition of members with specialized expertise in this area.

Executive Director Davis noted that Mr. Riding's inquiry has raised a significant point that he has not previously considered. Executive Director Davis stated that he intends to contemplate the proposal further, as the Board may already have the necessary statutory authority to possibly implement this change.

Executive Director Davis requested feedback from the Board regarding the possibility of expanding the Board's makeup to include this specific area of expertise.

Dr. Richard Codell expressed his support for the initiative of expanding the Board and noted that he knows several qualified individuals who may be interested in participating.

Dr. Codell stated that while the U.S. Nuclear Regulatory Commission is capable of oversight, many states maintain their own nuclear agencies to stay current on nuclear power, waste, safety, and environmental concerns. Dr. Codell emphasized that if the State of Utah intends to host a nuclear plant, it is important that we also develop this internal expertise and oversight capabilities.

Executive Director Davis stated that this matter will undergo further review and will be brought back for further discussion with the Board. Executive Director Davis asked Board members if they have any additional comments on this matter to reach out to him or Director Sonnenburg or one of the Division's Assistant Directors.

There were no additional comments or questions.

## **IX. Executive Director's Report.**

Executive Director Davis informed the Board that at the beginning of the 2026 Utah Legislative Session, executive agencies were directed to prepare a 5% cut to their ongoing general funds. While the appropriation subcommittee initially suggested specific adjustments to meet this target, Executive Director Davis reported that following productive dialogue throughout the session with legislators, the impact on UDEQ was significantly minimized as the permanent cuts consist of only one full-time employee (FTE) and \$45,000 cut in ongoing general fund money; the impacted FTE cut was from the Executive Director's office.

Executive Director Davis also provided updates on several legislative and budgetary developments affecting the UDEQ divisions and ongoing projects, including the ongoing funding for the new NERO.

Executive Director Davis briefly discussed House Bill 545. Following the passage of this bill, the UDEQ was awarded \$3 million from a fee paid by EnergySolutions. Executive Director Davis noted that 10 percent of this fee has been directed to the UDEQ to support energy-related permitting reforms, as the goal is to improve speed, transparency, and innovations in UDEQs processes while maintaining all environmental protections.

Executive Director Davis briefly discussed Senate Bill 234, which originally sought to limit the UDEQ's authority regarding the U.S. EPA and the U.S. Nuclear Regulatory Commission standards and state law implementation. This bill was amended to exempt the Title 19 program. This amendment ensures that UDEQs existing legislative mandates remain intact and its current authority is largely preserved. The new standards in this bill will only apply if UDEQ pursues initiatives outside of established federal or state statutes.

Executive Director Davis briefly discussed House Bill 78 and two related resolutions that underscore the State of Utah's commitment to nuclear power under "Operation Gigawatt." Executive Director Davis stated that as we move forward, UDEQ will play an active role in this initiative. UDEQ is committed to a consent-driven approach that engages local communities, addresses safety concerns, and ensures all questions are answered as we work to advance these goals safely and efficiently.

There were no additional comments or questions.

**X. Election of Board Chair and Vice Chair (Board Action Item).**

Chairman Mickelson informed the Board that each year a Board Chairman and Vice-Chairman must be elected. Chairman Mickelson conducted the elections.

Chairman Mickelson requested nominees to serve as Board Chairman. Dennis Riding nominated Brett Mickelson to continue to serve as Board Chairman; no other nominees were presented.

**It was moved by Dennis Riding and seconded by Dr. Steve McIff and UNANIMOUSLY CARRIED for Brett Mickelson to serve as Board Chairman. (Chairman Mickelson abstained from voting.)**

Chairman Mickelson requested nominees to serve as Board Vice-Chairman. Dr. Steve McIff nominated Dennis Riding to serve as Board Vice-Chairman; no other nominees were presented.

**It was moved by Dr. Steve McIff and seconded by Scott Wardle and UNANIMOUSLY CARRIED for Dennis Riding to serve as Board Vice-Chairman.**

Chairman Mickelson commented that he looks forward to working with the Board and to support Division staff.

**XI. Other Business.**

**A. Miscellaneous Information Items.**

Assistant Director Knudsen requested a working lunch be added prior to the upcoming April Board meeting.

Assistant Director Knudsen stated that as a follow-up to an information item on the Utah Solid Waste Management Plan (Plan) requirements for the Board, shared at the September Board meeting by Kelly Shaw, the Division is now working with a contractor to assist in drafting the Plan.

Chairman Mickelson has agreed to hold a working session over lunch before the April 9th Board Meeting. During this session, Division staff will review process timelines, talk through key efforts, and address any questions the Board may have.

Further details on the working lunch will be circulated by Arlene Lovato as the details are finalized.

**B. Scheduling of next Board meeting w/Board working lunch (April 9, 2026).**

The next Board meeting is scheduled for April 9, 2026, at the Utah Department of Environmental Quality, Multi-Agency State Office Building.

Interested parties can join via the Internet at: [meet.google.com/gad-sxsd-uvs](https://meet.google.com/gad-sxsd-uvs)  
Or by phone at (US) +1 978-593-3748 PIN: 902 672 356#

**XII. Adjourn.**

The meeting adjourned at 2:00 p.m.

**PST STATISTICAL SUMMARY**  
**March 1, 2025 -- February 28, 2026**

PROGRAM													
	March	April	May	June	July	August	September	October	November	December	January	February	(+/-) OR Total
Regulated Tanks	4,886	4,897	4,907	4,902	4,907	4,912	4,906	4,907	4,917	4,914	4,894	4,903	17
Tanks with Certificate of Compliance	4,674	4,682	4,683	4,692	4,695	4,701	4,721	4,731	4,756	4,753	4,751	4,758	84
Tanks without COC	212	215	223	210	212	211	185	176	161	161	143	145	(67)
Cumulative Facillities with Registered A Operators	1,278	1,271	1,272	1,254	1,267	1,271	1,273	1,274	1,276	1,277	1,239	1,243	81.56%
Cumulative Facillities with Registered B Operators	1,280	1,273	1,273	1,256	1,266	1,270	1,272	1,272	1,274	1,275	1,198	1,206	79.13%
New LUST Sites	9	6	4	8	5	12	7	7	8	3	2	7	78
Closed LUST Sites	6	4	5	3	8	5	3	6	1	4	2	5	52
Cumulative Closed LUST Sites	5741	5748	5751	5758	5765	5768	5774	5776	5780	5783	5785	5790	49
FINANCIAL													
	March	April	May	June	July	August	September	October	November	December	January	February	(+/-)
Tanks on PST Fund	3,052	3,064	3,059	3,067	3,064	3,062	3,084	3,100	3,105	3,102	3,097	3,109	57
PST Claims (Cumulative)	738	741	740	740	739	739	739	740	739	740	782	783	45
Equity Balance	\$8,218,397	\$8,511,914	\$9,321,582	\$9,640,627	\$9,913,949	\$10,715,671	\$9,541,937	\$15,156,203	\$15,801,900	\$14,878,066	\$15,432,509	\$15,703,063	\$7,484,666
Cash Balance	\$38,536,696	\$38,830,213	\$39,639,881	\$39,958,926	\$40,232,248	\$41,033,970	\$39,860,236	\$40,213,598	\$40,859,295	\$39,935,461	\$40,489,904	\$40,760,458	\$2,223,762
Loans	0	0	0	0	0	0	2	0	0	0	0	0	0
Cumulative Loans	129	129	129	129	129	129	131	131	131	131	131	131	2
Cumulative Amount	\$6,213,705	\$6,123,705	\$6,123,705	\$6,123,705	\$6,123,705	\$6,123,705	\$6,520,492	\$6,520,492	\$6,520,492	\$6,520,492	\$6,520,492	\$6,520,492	\$306,787
Defaults/Amount	1	1	2	2	2	2	2	3	2	2	2	1	0
	March	April	May	June	July	August	September	October	November	December	January	February	TOTAL
Speed Memos	135	199	135	165	135	114	118	133	191	161	78	86	1,650
Compliance Letters	8	11	18	10	9	11	8	3	8	16	3	3	108
Notice of Intent to Revoke	1	0	0	0	0	0	0	0	0	0	0	0	1
Orders	0	0	0	2	1	0	0	2	0	3	no data	no data	8

# UTAH WASTE MANAGEMENT AND RADIATION CONTROL BOARD

## Executive Summary

### Final Adoption

#### Utah Administrative Code R315-101

April 9, 2026

<b>What is the issue before the Board?</b>	Approval from the Board is needed for final adoption of the proposed changes to Utah Administrative Code R315-101 of the hazardous waste rules. The changes amend the rule to provide the Director discretion as to when a Site Management Plan (SMP) is required for sites that meet Corrective Action Complete with Controls (CACWC).
<b>What is the historical background or context for this issue?</b>	<p>At the Board meeting on February 12, 2026, the Board approved the proposed changes to Utah Admin. Code R315-101 to be filed with the Office of Administrative Rules for publication in the <i>Utah State Bulletin</i>. The proposed changes were published in the March 1, 2026, issue of the <i>Utah State Bulletin</i> (Vol. 2026, No. 5).</p> <p>Selected pages from the <i>Utah State Bulletin</i> showing the publication of the proposed changes follow this Executive Summary.</p> <p>The public comment period for this rulemaking ended on March 31, 2026; no comments were received.</p>
<b>What is the governing statutory or regulatory citation?</b>	<p>The Board is authorized under Utah Code Annotated Subsection 19-6-105 to make rules that establish minimum standards for protection of human health and the environment.</p> <p>The rule changes also meet existing DEQ and state rulemaking procedures.</p>
<b>Is Board action required?</b>	Yes. Board approval for adoption of the rule changes is necessary.
<b>What is the Division Director's recommendation?</b>	The Director recommends the Board approve final adoption of the changes to Utah Admin. Code R315-101 as published in the March 1, 2026, issue of the <i>Utah State Bulletin</i> and set an effective date of April 16, 2026.
<b>Where can more information be obtained?</b>	Please contact Brandon Davis by email at <a href="mailto:bbdavis@utah.gov">bbdavis@utah.gov</a> or by phone at 385-622-1873.

# UTAH STATE BULLETIN

OFFICIAL NOTICES OF UTAH STATE GOVERNMENT  
Filed February 03, 2026, 12:00 a.m. through February 17, 2026, 11:59 p.m.

Number 2026-05  
March 01, 2026

Nancy L. Lancaster, Managing Editor

The *Utah State Bulletin (Bulletin)* is an official noticing publication of the executive branch of Utah state government. The Office of Administrative Rules, part of the Department of Government Operations, produces the *Bulletin* under authority of Section 63G-3-402.

The Portable Document Format (PDF) version of the *Bulletin* is the official version. The PDF version of this issue is available at <https://rules.utah.gov/>. Any discrepancy between the PDF version and other versions will be resolved in favor of the PDF version.

Inquiries concerning the substance or applicability of an administrative rule that appears in the *Bulletin* should be addressed to the contact person for the rule. Questions about the *Bulletin* or the rulemaking process may be addressed to: Office of Administrative Rules, PO Box 141007, Salt Lake City, Utah 84114-1007, telephone 801-957-7110. Additional rulemaking information and electronic versions of all administrative rule publications are available at <https://rules.utah.gov/>.

The information in this *Bulletin* is summarized in the *Utah State Digest (Digest)* of the same volume and issue number. The *Digest* is available by e-mail subscription or online. Visit <https://rules.utah.gov/> for additional information.

Office of Administrative Rules, Salt Lake City 84114

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Utah state bulletin.

Semimonthly.

1. Delegated legislation--Utah--Periodicals. 2. Administrative procedure--Utah--Periodicals.
- I. Utah. Office of Administrative Rules.

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(6) The Commissioner shall be responsible for filing all required reports with the national compact office.

**R277-929-4. Purple Star Schools.**

- (1) There is hereby created a purple star schools designation for Utah schools that excel in protecting the educational needs of students from military families.
- (2) The Commissioner shall establish an application process for Utah schools interested in the purple star schools designation.
- (3) The Commissioner shall review purple star school applications with the state council created in Section R277-929-3 and make recommendations for the purple star school designation.
- (4) The Superintendent shall award the purple star school designation to a Utah school that:
  - (a) has a designated staff point of contact for military students and families who acts as the primary link between a military family and the school;
  - (b) has a dedicated page on its school website featuring information and resources for military families;
  - (c) has a student-led transition program to include a student transition team coordinator;
  - (d) provides annual professional development for additional staff on special considerations for military students and families; and
  - (e) meets at least one of the following criteria:
    - (i) the school shall commit to hold a school-wide military recognition event;
    - (ii) the school's governing board shall pass a resolution publicizing support for military students and families; or
    - (iii) the school shall coordinate with the school liaison program from Hill Air Force Base or Dugway Proving Grounds to provide opportunities for active duty parents to volunteer in the school.
- (5)(a) The Superintendent shall approve a seal for schools with a purple star school designation.
- (b) A purple star school may use the approved seal on school letterhead, the school's website, and other school publications.
- (6) The Superintendent shall publish a list of schools receiving the purple star designation on the Board's website.
- (7) A purple star school recognized under this section shall submit an annual report on a form provided by the Superintendent by March 31 [~~annually~~].
- (8) The Superintendent may rescind a school's purple star school designation if:
  - (a) the school fails to file an annual report under Subsection (7); or
  - (b) the school is out of compliance with a requirement in Subsection (4).

**KEY: state council, military, compact**  
**Date of Last Change: 2026[July 9, 2024]**  
**Notice of Continuation: August 15, 2024**  
**Authorizing, and Implemented or Interpreted Law: Art X Sec 3; 53E-3-401(4)**

NOTICE OF SUBSTANTIVE CHANGE		
<b>TYPE OF FILING:</b> Amendment		
<b>Rule or section number:</b>	<b>R315-101</b>	<b>Filing ID: 57803</b>

**Agency Information**

<b>1. Title catchline:</b>	Environmental Quality, Waste Management and Radiation Control, Waste Management	
<b>Building:</b>	Multi-Agency State Office Building (MASOB)	
<b>Street address:</b>	195 N 1950 W	
<b>City, state:</b>	Salt Lake City, UT	
<b>Mailing address:</b>	PO Box 144880	
<b>City, state and zip:</b>	Salt Lake City, UT 84114-4880	
<b>Contact persons:</b>		
<b>Name:</b>	<b>Phone:</b>	<b>Email:</b>
Paige Walton	385-515-0086	pwalton@utah.gov
<b>Please address questions regarding information on this notice to the persons listed above.</b>		

**General Information**

<b>2. Rule or section catchline:</b>
R315-101. Cleanup Action and Risk-Based Closure Standards

<p><b>4. Purpose of the new rule or reason for the change:</b></p> <p>Rule R315-101 is being amended with the purpose of granting the director discretion regarding Site Management Plan requirements for sites designated as Corrective Action Complete with Controls.</p>
<p><b>5. Summary of the new rule or change:</b></p> <p>The amended rule provides the director discretion to determine, on a site-specific basis, if a Site Management Plan is required for sites designated as Corrective Action Complete with Controls.</p>

**Fiscal Information**

<p><b>6. Provide an estimate and written explanation of the aggregate anticipated cost or savings to:</b></p>
<p><b>A. State budget:</b></p> <p>It is not anticipated that there will be any cost or savings to the state budget due to this rule amendment.</p> <p>There will be no change to the procedures and manpower used by the State to review risk assessments and cleanup plans that are based on the amended rule.</p>
<p><b>B. Local governments:</b></p> <p>This rule change is not expected to have any fiscal impact on local governments' revenues or expenditures because it does not shift any oversight costs or financial obligations to local jurisdictions.</p>
<p><b>C. Small businesses</b> ("small business" means a business employing 1-49 persons):</p> <p>There are approximately 853 small businesses in the Land Subdivision (NAICS 237210) and Commercial and Institutional Building Construction (NAICS 236220) industries in the State of Utah. Based on internal agency data from the previous fiscal year, there were approximately 10 applications for site closure, of which approximately five (50%) would have been eligible for the waiver established by this rule change.</p> <p>This rule change has the potential to provide a direct fiscal benefit to approximately three small businesses per year. These businesses are expected to experience a direct fiscal benefit as the Director's discretion to waive a Site Management Plan (SMP) will result in a one-time cost savings of approximately \$3,000 per site in avoided professional fees and administrative burdens.</p> <p>The exact number of future impacted businesses remains inestimable because the direct fiscal benefit is granted on a site-specific, discretionary basis and is contingent on the number and complexity of future applications received by the agency.</p> <p>This rule change imposes no new fiscal costs.</p>
<p><b>D. Non-small businesses</b> ("non-small business" means a business employing 50 or more persons):</p> <p>There are approximately 42 non-small businesses in the Land Subdivision (NAICS 237210) and Commercial and Institutional Building Construction (NAICS 236220) industries in the State of Utah. Based on internal agency data from the previous fiscal year, there were approximately 10 applications for site closure, of which approximately 5 (50%) would have been eligible for the waiver established by this rule change.</p> <p>This rule change has the potential to provide a direct fiscal benefit to approximately two non-small businesses per year. These businesses are expected to experience a direct fiscal benefit as the Director's discretion to waive a Site Management Plan (SMP) will result in a one-time cost savings of approximately \$3,000 per site in avoided professional fees and administrative burdens.</p> <p>The exact number of future impacted businesses remains inestimable because the direct fiscal benefit is granted on a site-specific, discretionary basis and is contingent on the number and complexity of future applications received by the agency.</p> <p>This rule change imposes no new fiscal costs.</p>
<p><b>E. Persons other than small businesses, non-small businesses, state, or local government entities</b> ("person" means any individual, partnership, corporation, association, governmental entity, or public or private organization of any character other than an <b>agency</b>):</p>

This rule change is not expected to have a significant fiscal impact on other persons' revenues or expenditures because the regulatory requirements for Site Management Plans primarily affect business entities and developers.

However, persons other than small businesses, non-small businesses, state, or local government entities acting could experience a direct fiscal benefit. These persons may see a one-time cost savings of approximately \$3,000 per application by avoiding professional fees for Site Management Plan development. The total aggregate fiscal impact for this group is inestimable because the number of persons who will manage a contaminated site closure rather than utilizing a business entity is unknown and cannot be reasonably predicted from historical agency data.

This rule change imposes no new fiscal costs.

**F. Compliance costs for affected persons:**

It is not anticipated that there will be any additional compliance costs for affected persons due to the adoption of this rule other than those mentioned above.

**G. Regulatory Impact Summary Table** (This table includes only fiscal impacts the agency was able to measure. If the agency could not estimate an impact, it is excluded from this table but described in boxes A through F.)

Regulatory Impact Summary Table					
Fiscal Cost	FY2026	FY2027	FY2028	FY2029	FY2030
State Budget	\$0	\$0	\$0	\$0	\$0
Local Governments	\$0	\$0	\$0	\$0	\$0
Small Businesses	\$0	\$0	\$0	\$0	\$0
Non-Small Businesses	\$0	\$0	\$0	\$0	\$0
Other Persons	\$0	\$0	\$0	\$0	\$0
<b>Total Fiscal Cost</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
Fiscal Benefits	FY2026	FY2027	FY2028	FY2029	FY2030
State Budget	\$0	\$0	\$0	\$0	\$0
Local Governments	\$0	\$0	\$0	\$0	\$0
Small Businesses	\$6,000	\$9,000	\$9,000	\$9,000	\$9,000
Non-Small Businesses	\$0	\$6,000	\$6,000	\$6,000	\$6,000
Other Persons	\$0	\$0	\$0	\$0	\$0
<b>Total Fiscal Benefits</b>	<b>\$6,000</b>	<b>\$15,000</b>	<b>\$15,000</b>	<b>\$15,000</b>	<b>\$15,000</b>
<b>Net Fiscal Benefits</b>	<b>\$6,000</b>	<b>\$15,000</b>	<b>\$15,000</b>	<b>\$15,000</b>	<b>\$15,000</b>

**H. Department head comments on fiscal impact and approval of regulatory impact analysis:**

The Executive Director of the Department of Environmental Quality, Tim Davis, has reviewed and approved this regulatory impact analysis.

This rule change provides regulatory flexibility for Cleanup Action and Risk-Based Closure Standards without any reduction to protection of human health and the environment.

**Citation Information**

**7. Provide citations to the statutory authority for the rule. If there is also a federal requirement for the rule, provide a citation to that requirement:**

Section 19-6-105	Section 19-6-106	
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**Public Notice Information**

**9. The public may submit written or oral comments to the agency identified in box 1.**

<b>A. Comments will be accepted until:</b>	03/31/2026
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<b>10. This rule change MAY become effective on:</b>	04/16/2026
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NOTE: The date above is the date the agency anticipates making the rule or its changes effective. It is NOT the effective date.

**Agency Authorization Information**

<b>Agency head or designee and title:</b>	Ted H. Sonnenburg, PE, LEHS, Division Director	<b>Date:</b>	02/12/2026
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**R315. Environmental Quality, Waste Management and Radiation Control, Waste Management.**

**R315-101. Cleanup Action and Risk-Based Closure Standards.**

**R315-101-1. Purpose, Applicability.**

(a) Purpose. Rule R315-101 establishes information requirements to support risk-based cleanup and closure standards at sites for which remediation, including removal of hazardous constituents to background levels is not the remediation objective. The procedures in Rule R315-101 also provide for continued management of sites for which risk-based clean closure standards are not met.

(b) Applicability.

(1) Rule R315-101 applies to any responsible party, or other interested party on a voluntary basis, such as a prospective purchaser, a lending institution, or land developer, involved in management of a site contaminated with hazardous waste, hazardous constituents, or other contaminants, as determined by the director. Rule R315-101 does not apply to a site that has been or will be cleaned to background levels of constituents.

(2) In the event of a release of hazardous waste or material that, when released, becomes a hazardous waste, the requirements of Rule R315-101 apply if the responsible party fails to clean up the released material and any residue or contaminated soil, water, or other material resulting from the release, as required by Section R315-263-31. The requirements of Section R315-263-31 shall be considered met if:

(i) the level of cumulative risk present at the site is less than or equal to  $1 \times 10^{-6}$  for carcinogens and the hazard index is less than or equal to one for non-carcinogens based on a risk assessment conducted assuming the land use exposure scenario defined in Subsection R315-101-5(g)(1);

(ii) the director determines that ecological effects are insignificant based on the approved assessment conducted in accordance with Subsection R315-101-5(j); and

(iii) the director determines that current and potential future impacts to groundwater are insignificant in accordance with Subsection R315-101-5(f)(8).

(3) The responsible party of a hazardous waste management site shall meet the requirements of Sections R315-265-110 through R315-265-120 or Sections R315-264-110 through R315-264-120, as applicable, before implementation of any activities described in Rule R315-101.

(4) The requirements of Subsections R315-270-1(c)(5) and R315-270-1(c)(6) shall be considered met for a hazardous waste management unit or solid waste management unit if:

(i) the level of risk, cumulative, present at the site is less than or equal to  $1 \times 10^{-6}$  for carcinogens and a hazard index of less than or equal to one for non-carcinogens, based on the risk assessment conducted, assuming the land use exposure scenario defined in Subsection R315-101-5(g)(1);

(ii) the director determines that ecological effects are insignificant based on the approved assessment conducted in accordance with Subsection R315-101-5(j); and

(iii) the director determines that current and potential future impacts to groundwater are insignificant in accordance with Subsection R315-101-5(f)(8).

(5) If these risk criteria are met, a request for a risk-based clean closure in accordance with Subsection R315-101-7(a) may be submitted to the director for review and approval.

(6) If the level of risk, cumulative, present at the site is greater than the limits defined in Subsection R315-101-1(b)(2) or R315-101-1(b)(4) or the director determines that ecological effects may be significant in accordance with Subsection R315-101-5(j), or current and potential future impact to groundwater is significant in accordance with Subsection R315-101-5(f)(8), then a risk-based clean closure shall not be granted. Either corrective action, as determined in accordance with Section R315-101-6 and as defined in Subsection R315-101-13(u), appropriate site management as defined in Subsection R315-101-13(f) and as determined in Subsections R315-101-7(b) and R315-101-7(c), or both, shall be required.

(c) For determination of appropriate corrective action at a site, the following criteria shall be considered in order of importance:

(1) the impact or potential impact of the contamination on human health;

(2) the impact or potential impact of the contamination on the environment;

(3) the technologies available for use in cleanup; and

(4) economic considerations and cost-effectiveness of cleanup options.

(d) The responsible party shall follow applicable guidance documents, including Utah and federal risk assessment guidance and methods approved by the director, as set forth in Rule R315-101.

**R315-101-2. Stabilization of Releases.**

(a) The responsible party shall immediately take appropriate action to stabilize the site either through source removal or source control. If the director determines that the action taken is insufficient to meet the requirements of Section R315-263-30, the responsible party shall submit a work plan, pursuant to Subsection R315-101-2(b), to the director for approval within 60 days of receiving notice from the director.

(b) The work plan shall:

- (1) define the scope of work to be performed;
- (2) include a description of the interim measures and other corrective actions to be taken; and
- (3) include a description of how the plan shall meet the criteria of source removal or source control.

(c) The responsible party shall implement the work plan in accordance with the schedule contained in the approved plan. The responsible party shall implement interim measures or other corrective actions as approved. If the responsible party fails to take the measures required for stabilizing the site, the director may request the executive director of the Department of Environmental Quality to take abatement and cost recovery actions as provided in Sections 19-6-301 through 19-6-326 of the Utah Hazardous Substances Mitigation Act.

**R315-101-3. Principle of Non-degradation.**

(a) When closing or managing a contaminated site that has been stabilized in accordance with Section R315-101-2, the responsible party shall, to the extent practicable in accordance with Subsection R315-101-1(c), not allow the mass of contaminants in the source area to increase. Levels of contamination in groundwater, regardless of quality, shall not increase beyond the existing levels of contamination at a site when the responsible party has defined the nature and extent of contamination pursuant to Section R315-101-4. Consideration will be given to naturally occurring variations in groundwater contaminant concentrations, natural groundwater flow, and dispersion.

(b) The responsible party shall demonstrate compliance with Subsection R315-101-3(a) by submitting appropriate sampling or other data as may be required by the director.

(c) If at any time the level of contamination increases to a significant level, as determined by the director on a case-by-case basis, the responsible party shall take action, as determined by the director, such as source removal or source control, to prevent further degradation of groundwater. A work plan addressing interim action or other corrective action to mitigate the situation shall be submitted to the director for review and approval.

**R315-101-4. Site Characterization, Data Collection and Documentation.**

(a) Purpose. The intent of a site investigation or characterization is to define the nature and extent of all impacted environmental media, whether on-site or off-site. A phased approach to site characterization may be conducted as applicable on a case-by-case basis. These data shall be collected as part of an initial site investigation to define the nature and extent of potential contamination. The known or suspected history of past or current operations at the facility, in any environmental media shall be considered. Site characterization may also include data collected to demonstrate efficacy of a corrective action remedy pursuant to Section R315-101-6. Before the collection of any data that shall be used in a site characterization, corrective action, or post-remedial corrective action risk assessment, the responsible party shall develop and submit a work plan to the director for review and approval. The work plan shall include the following:

(1) Sampling and analysis plan specifying methods and procedures to be used for data collection and analysis as outlined in Section R315-261-1090, Appendix I, and in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" EPA Publication SW-846, available at the US EPA Hazardous Waste Test Methods/SW-846 website:

(i) samples shall be analyzed by a Utah certified laboratory using procedures and methods in accordance with "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" EPA Publication SW-846, available at the US EPA Hazardous Waste Test Methods/SW-846 website;

(ii) analysis not available in Utah or methods not contained in Subsection R315-101-4(a)(1)(i) may be reviewed and approved by the director; and

(iii) documentation for laboratory work shall include the data accompanied by quality assurance and quality control measures taken in accordance with current environmental laboratory standards for a level III data package, or other QA/QC data level as determined by the director on a site-specific basis.

(2) Representative proposed media sample locations with depths, sample analytes and justification that the proposed sampling is sufficient to define the nature and extent of contamination:

(i) surface soil is defined as surface or zero to a maximum of six inches below ground surface, or as determined on a case-by-case basis; and

(ii) subsurface soil is defined as greater than six inches below ground surface, or as determined on a case-by-case basis.

(3) Conceptual site model for a site-specific characterization, identifying and showing potential primary source areas, media of concern, contaminant release mechanism, receptors of interest, exposure pathways and possible contaminant migration pathways, including the following media as applicable based on current site conditions:

- (i) sediments;
- (ii) soil;
- (iii) biota;
- (iv) groundwater;
- (v) surface water; and
- (vi) air.

(4) Data quality objective process steps related to the implementation of the sampling and analysis plan in accordance with "Guidance on Systematic Planning Using the Data Quality Objectives Process," EPA QA/G-4, EPA/240/B-06/001, as incorporated by reference in Section R315-101-12.

(5) Quality assurance project plan for field procedures, chain-of-custody and laboratory analytical methods to be used for the sampled media.

(6) Field quality assurance and quality control procedures to characterize and dispose of any site investigation derived waste in an appropriate manner, including a plan for decontamination procedures, field instrument calibration procedures, any standard operating procedures and other relevant documentation.

NOTICES OF PROPOSED RULES

(b) Background levels. Based on the site characterization sampling results, the responsible party may determine or propose background levels of suspected hazardous constituents and may follow or consider procedures in the Soil Background and Risk Guidance document available on the Interstate Technology Regulatory Council website. The constituent list may be based on the inventory as determined in Subsection R315-101-4(c)(5) in media of concern, including: sediments, soil, groundwater, surface water, and air that are representative of the site.

(c) Additional information. The following additional information shall be collected to characterize the site and to define site boundaries and areas of contamination:

- (1) a description of the site, including legal boundaries;
- (2) historical land use and ownership of the site, including existing aerial photos of the site through time if requested by the director;
- (3) topographical and other relevant maps of sufficient detail, scale, and accuracy to depict and locate each past and current physical structure including any buildings and waste activities at the site;
- (4) information and maps of sufficient detail, scale, and accuracy to describe regional, local, and site geology, surface water, groundwater and groundwater quality, drainage features and other hydrogeological conditions;
- (5) an inventory of each current and past waste stream managed at the site, hazardous waste management units, areas of concern and solid waste management units at the site, including process descriptions, amounts and types of waste generated and disposed and suspected contamination source information;
- (6) location and boundaries of areas of concern including any hazardous waste management units and solid waste management units;
- (7) any past sampling results, and an inventory of any releases, discharges and spills;
- (8) available information such as reports and data on any previous corrective actions; and
- (9) a list of all off-site property owners whose property has been or may have been affected by the release of contaminants for which the responsible party is responsible. This list shall include the name and address of each property owner and shall identify the current land use of each property.

(d) Petroleum wastes and total petroleum hydrocarbon.

At sites where petroleum wastes may be present, the media samples shall be analyzed for volatile organic compounds, semi-volatile organic compounds including Polyaromatic Hydrocarbons (PAHs), and total metals.

(e) The responsible party may propose other analytical suites for the impacted media for review and approval by the director. This shall include Polychlorinated Biphenyls (PCBs), dioxins and furans, and any other emerging contaminant of concern, as determined on a case-by-case basis, based on the history of the site and activities.

(f) Relevant information gathered in Subsections R315-101-4(a) through R315-101-4(e) shall be submitted in a site characterization report to the director for review and approval. In addition, the site characterization report shall include:

- (1) site location, legal description and objectives of the site investigation;
- (2) methodology and field activities completed, including the handling of any site investigation derived wastes;
- (3) maps of sufficient detail and accuracy to depict waste management units, areas of contamination, nature and extent of contamination, topography, geology, groundwater quality, and potentiometric surface;
- (4) site and regional geological, hydrogeological, and hydrological descriptions;
- (5) a detailed discussion of any areas of contamination found during the site characterization field work;
- (6) listing and concentrations of any historic and current hazardous constituents identified in Section R315-101-4;
- (7) background levels of hazardous constituents, including details of statistical methods used to analyze the data gathered, if applicable;
- (8) the hazardous constituents identified in accordance with Subsections R315-101-4(f)(6) and R315-101-4(f)(7) shall be known as contaminants of interest;
- (9) descriptions of historic and current releases of hazardous constituents and expected extent of migration from the areas of contamination;
- (10) deviations from the approved site characterization work plan and the sampling and analysis plan;
- (11) discussion of the evaluated potential exposure pathways including groundwater, surface water, sediments, surface and subsurface soils and air;
- (12) a summary outlining the completion of data quality objectives, completed analytical request forms for each analysis performed reported on dry-weight basis, actual sampling locations and depths with justification for variations to the approved sampling and analysis plan, any statistical analysis performed if completed, and quality assurance and quality control results and analytical data validation report in accordance with current environmental laboratory standards for a level II data package, or other QA/QC data level, as determined by the director on a site-specific basis;
- (13) revised conceptual site model identified in Subsection R315-101-4(a)(3) based on the information presented in the final site characterization report; and
- (14) conclusions and recommendations for additional site work and applicable supporting documentation, including figures, tables, and appendices.
- (15) Groundwater, on-site or off-site, shall be considered impacted if contaminant levels are above screening levels as defined in Subsection R315-101-5(f)(1)(vii) or maximum contaminant levels.

(g) Additional site characterization data shall be collected after corrective action or other remedial actions. The confirmation data shall be used to support a closure risk assessment.

**R315-101-5. Human Health and Ecological Risk Evaluation Criteria and Risk Assessment.**

(a) When conducting the risk assessment, the responsible party shall use the conceptual site model, as defined in Subsection R315-101-13(o) and as described in Subsection R315-101-4(a)(3) or R315-101-4(f)(13), as applicable, and shall use applicable site characterization or confirmation data. For the areas of contamination as defined in Subsection R315-101-13(g), the following shall be included when conducting the risk assessment:

(1) identification, concentration, and distribution of any suspected hazardous constituents identified in Section R315-101-4 and defined as contaminants of interest in Subsection R315-101-4(f)(8);

(2) fate of contaminants of interest and any pathways and transport of contaminants of interest;

(3) any potential exposure routes;

(4) human receptors; and

(5) ecological receptors.

(b) General Human Health Risk Assessment Methodology.

(1) A risk assessment shall be conducted once the nature and extent of contamination has been adequately defined or corrective action completed. The risk assessment may be performed for impacted media by choosing either a Tier 1 approach in accordance with Subsection R315-101-5(f) or a Tier 2 risk assessment process in accordance with Subsection R315-101-5(g). Tier 1 shall be a screening risk assessment and Tier 2 shall be a refined risk assessment that may include site-specific exposure assumptions and allowance of alternative approaches, such as a Monte Carlo exposure risk analysis, probabilistic risk assessment. If excess risks are noted for the Tier 1 assessment, a Tier 2 assessment is required.

(2) The concentration term for each medium and for each contaminant of interest identified in Section R315-101-4 and Subsection R315-101-4(f)(8) and determined to be a contaminant of potential concern following comparison to background shall be evaluated using either the maximum detected concentration or an upper confidence limit as derived using the US EPA ProUCL program.

(3) The fate, pathways, and transport of contaminants of interest identified in Section R315-101-4, defined in Subsection R315-101-4(f)(8), and determined to be a contaminant of potential concern following comparison to background, shall be evaluated using the conceptual site model developed pursuant to Subsection R315-101-4(a)(3) or R315-101-4(f)(13), as applicable and approved by the director.

(c) The exposure scenarios identified in the conceptual site model shall be estimated using reasonable maximum exposure parameters and shall be based on both current and potential future anticipated land use and receptors defined in Subsections R315-101-5(g)(1) and R315-101-5(g)(2).

(d) The conceptual site model shall include a determination as to whether or not each of the following pathways is complete under both current and anticipated future conditions. Risks shall be quantified for those receptors where exposure pathways have a reasonable potential for being complete unless it may be demonstrated that the risk is less significant when compared to other quantified receptor risks.

(1) Potential exposure pathways for surficial soils include:

(i) leaching to groundwater;

(ii) migration to a surface water body; and

(iii) human exposure through ingestion of soil, dermal contact with soil, inhalation of vapors and particulates emitted by surficial soils.

(2) Potential exposure pathways for subsurface soils include:

(i) leaching or vapor migration, including sinking vapors, to groundwater;

(ii) migration to a surface water body;

(iii) volatilization and upward migration of vapors from subsurface soil and potential indoor or outdoor inhalation of these emissions;

and

(iv) human exposure through ingestion of soil, dermal contact, inhalation of vapors and particulates.

(3) The soil exposure interval applicable to residents is defined as surface down to ten feet below ground surface. The soil exposure interval applicable to the industrial or commercial worker is defined as surface to one foot below ground surface. The soil exposure interval applicable to the construction worker is defined as surface down to depth of construction of ten feet below ground surface. Alternative soil exposure intervals shall be determined on a case-by-case basis as approved by the director.

(4) Soil exposure pathways applicable to all receptors where the conceptual site model, in accordance with Subsection R315-101-4(a)(3) or R315-101-4(f)(13), identifies soil as a complete or potentially complete exposure pathway, shall include:

(i) ingestion;

(ii) dermal contact with soil;

(iii) inhalation of vapor emissions; and

(iv) inhalation of particulates from soil.

(5) Groundwater exposure pathways applicable to all receptors where the conceptual site model, in accordance with Subsection R315-101-4(a)(3) or R315-101-4(f)(13), identifies groundwater as a complete or potentially complete exposure pathway, shall include:

(i) ingestion;

(ii) dermal contact with groundwater; and

(iii) inhalation of vapor emissions.

(6) Additional exposure to groundwater shall be considered on a site-specific basis which may include:

(i) volatilization and upward migration of vapors from groundwater and potential indoor inhalation of vapor emissions;

(ii) volatilization and upward migration of vapors from groundwater and potential outdoor inhalation of vapor emissions;

(iii) potable use of groundwater, including ingestion of groundwater, dermal contact with groundwater during showering or bathing, and inhalation of vapors from domestic use of groundwater if pathway is complete; and

(iv) migration to surface water body and potential impacts to surface water and potential exposures to surface water.

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- (7) Other exposure pathways that may need to be considered on a site-specific basis may include the following:
- (i) contact with soils and ingestion of soils, sediments, inhalation of vapors and particulates, surface water and groundwater for any other anticipated human contacts, such as recreational and trespasser activities;
  - (ii) ingestion of produce grown in impacted soils;
  - (iii) use of groundwater for irrigation purposes;
  - (iv) use of groundwater for industrial purposes;
  - (v) ingestion of livestock or fish or other aquatic organisms that, as a result of media contamination, have bioaccumulated constituents of potential concern through the food chain; and
  - (vi) ingestion, dermal contact, and inhalation of vapors from surface water such as from recreational activities, including swimming.
- (e) The responsible party shall develop a risk assessment work plan for review and approval by the director before the risk evaluation.
- (f) Tier 1 screening risk assessment. The Tier 1 evaluation shall assume no institutional or engineering controls in place, such as security, signage, pavements, personal protective equipment, fences, or remediation. The Tier 1 risk assessment evaluation may not be appropriate under circumstances when every complete exposure pathway is not covered by the screening values. The Tier 2 refined risk assessment approach may be more appropriate for evaluation in this circumstance.
- (1) Screening levels. The Tier 1 evaluation shall use one or more of the following screening levels:
- (i) US EPA Regional Screening Levels available at the US EPA Risk Assessment, Regional Screening Levels (RSLs) website;
  - (ii) site-specific background 95% upper tolerance limit levels developed in accordance with the US EPA ProUCL model;
  - (iii) vapor intrusion screening levels calculated using US EPA Vapor Intrusion Screening Level Calculator, as incorporated by reference in Section R315-101-12, available at the US EPA Vapor Intrusion Screening Levels Calculator website;
  - (iv) petroleum vapor intrusion screening guidelines developed in accordance with "Technical Guide for Addressing Petroleum Vapor Intrusion at Leaking Underground Storage Tank Sites," US EPA, as incorporated by reference in Section R315-101-12;
  - (v) site-specific confidence limits for groundwater background established for the site in accordance with "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance," US EPA, as incorporated by reference in Section R315-101-12; or
  - (vi) in instances where a US EPA Regional Screening Level is not available, a responsible party, with the approval of the director, may develop and calculate a site-specific screening value.
- (2)(i) The US EPA Regional Screening Levels, confidence limits, site-specific background levels, calculated site-specific screening values, and vapor intrusion screening levels shall be known collectively as screening values.
- (ii) Documents referenced in Subsections R315-101-5(f)(1)(i) through R315-101-5(f)(1)(vi) and other director approved sources shall be used as sources for obtaining screening values.
- (3) Determination of constituents of potential concern.
- (i) For inorganic contaminants of interest, the following steps shall be followed for determination of constituents of potential concern that shall be included in the risk evaluation.
- (A) The maximum detected concentration of each contaminant of interest for soil, sediment, and groundwater, or other site-specific media such as surface water, may be compared to the site-specific background reference level, defined as the 95% upper tolerance limit or a confidence limit. If the maximum detected site concentration is greater than the background reference level, the inorganic contaminants of interest shall be considered a constituent of potential concern. If site-specific background reference levels are not available, the detected inorganic contaminant shall be retained as a contaminant of potential concern.
- (B) For those inorganic contaminants of interest whose maximum concentrations are greater than the background reference, a test of means hypothesis shall be used to determine if inorganic contaminants of interest are present at elevated levels over background levels.
- (C) If the results of the test of means hypothesis indicate the detected inorganic contaminant of interest is elevated over background level, it will be retained as a constituent of potential concern.
- (D) If a test of means hypothesis cannot be performed due to sample size or if there is no established site-specific background reference level, the inorganic contaminant of interest shall be retained as a constituent of potential concern.
- (ii) For organic contaminants of interest, all contaminants with a minimum of one detection shall be retained as constituents of potential concern. If site-specific background reference levels are available for organics, additional refinement of organic contaminants of potential concern may be conducted in accordance with Subsection R315-101-5(f)(3)(i).
- (4) Exposure point concentration.
- (i) The initial exposure point concentration for all inorganic and organic constituents of potential concern shall be the maximum detected concentration for each medium evaluated in the Tier 1 assessment.
- (ii) If the maximum detected concentration results in a cancer risk greater than  $1 \times 10^{-6}$  or a hazard quotient greater than one, a refined exposure point concentration based on a 95% upper confidence limit on the mean may be calculated using the EPA ProUCL program. The lesser of the maximum concentration and the 95% upper confidence limit concentration shall be selected as the exposure point concentration.
- (iii) If the minimum required sample size of eight or more for calculating the 95% upper confidence limit cannot be met or there are insufficient numbers of detection, the maximum detected concentration, or an alternative concentration as approved by the director, shall be the exposure point concentration.
- (5) Cumulative risk shall be determined for all carcinogenic constituents of potential concern and a hazard index shall be determined for all noncarcinogenic contaminants of potential concern.
- (i) The cumulative effects screening cancer risk estimate is calculated as the sum of the ratios of exposure point concentrations and screening values for the combined land use exposure pathways, identified under the conceptual site model developed in accordance with Subsection R315-101-4(a)(3) or R315-101-4(f)(13) as applicable for impacted media, multiplied by  $1 \times 10^{-6}$ .

(ii) The hazard index is calculated as the sum of the ratios of exposure point concentrations and screening values for the combined residential land use exposure pathways identified under the conceptual site model in accordance with Subsection R315-101-4(a)(3) or R315-101-4(f)(13) as applicable for impacted media.

(iii) If a contaminant of potential concern has both carcinogenic and non-carcinogenic toxicity, both toxicities shall be evaluated using both the carcinogenic and non-carcinogenic based US EPA Regional Screening Level or other screening levels.

(iv) If the cumulative effects screening cancer risk is less than or equal to  $1 \times 10^{-6}$  and hazard index is less than or equal to one, then the cumulative effects screening risks posed by detected carcinogenic contaminants of interest at the site meet acceptable risk levels and additional evaluation for the receptor and scenario is not required.

(v) If the cumulative effects screening cancer risk is greater than  $1 \times 10^{-6}$  or the hazard index is greater than one, then a Tier 2 risk assessment or further evaluation may be required.

(6) Residential land use.

(i) Risks to residents from ingestion of livestock grazing on a contaminated site shall be evaluated and added to the cumulative effects risk equation if it is determined to be a plausible and complete exposure pathway.

(ii) Vapor intrusion pathway if complete, shall be evaluated and added to the cumulative effects screening risk equation.

(iii) Any other relevant exposure pathway consistent with the residential exposure pathway shall be evaluated and added to the cumulative risk.

(iv) If it is determined that the residential land use cumulative effects screening cancer risk posed by constituents of potential concern is less than or equal to the target cancer risk of  $1 \times 10^{-6}$  and the hazard index is less than or equal to one for each combined residential land use exposure pathways, and it is determined that there are no current and potential future impacts to groundwater as determined by site-specific attenuation factors derived using "Supplemental Guidance For Developing Soil Screening Levels," US EPA, as incorporated by reference in Section R315-101-12, Subsections R315-101-4(f)(15), R315-101-5(f)(8) and R315-101-5(f)(1)(vii), and ecological impacts are insignificant in accordance with Subsection R315-101-5(j), then the site meets the risk-based clean closure criteria for no further action or unrestricted land use as identified in Subsection R315-101-7(a).

(v) If it is determined that the residential land use cumulative effects screening cancer risk posed by constituents of potential concern is greater than the target risk of  $1 \times 10^{-6}$  or the hazard index is greater than one for each combined residential land use exposure pathway, then further evaluation of the site may be conducted using either the Tier 2 refined risk assessment evaluation approach for a residential land use exposure scenario as identified in Subsection R315-101-5(g)(1) or a non-residential land use exposure scenario as identified in Subsection R315-101-5(g)(2), and site management as identified in Section R315-101-7, or the responsible party may choose to conduct corrective action as identified in Section R315-101-6 to mitigate risks at the site to residential acceptable levels.

(vi) An ecological evaluation shall also be completed as part of the screening residential land use risk evaluation as described in Subsection R315-101-5(j).

(vii) A groundwater impact evaluation shall also be completed as part of the screening residential land use risk evaluation as identified in Subsection R315-101-5(f)(8).

(7) Industrial or commercial land use or construction worker.

(i) If the cumulative effects screening risk is less than or equal to a cancer risk of  $1 \times 10^{-6}$  and the hazard index is less than or equal to one, then the cumulative effects screening risks posed by detected contaminants of potential concern at the site meets the industrial or commercial land use or construction worker risk, or both, and the site meets the criteria for restricted land use as identified in the Subsection R315-101-7(b).

(ii) If the cumulative effects screening risk is greater than a cancer risk of  $1 \times 10^{-6}$  or the hazard index is greater than one, then the cumulative effects screening risks posed by the detected contaminants of potential concern at the site do not meet the industrial or commercial land use or construction worker, or both, and a Tier 2 assessment or further evaluation is required.

(iii) If the cumulative effects screening risk is greater than cancer risk of  $1 \times 10^{-6}$  but less than  $1 \times 10^{-4}$  and the hazard index is less than or equal to one, then restricted land use closure with land use controls may be used in accordance with Subsections R315-101-7(b)(1) and R315-101-7(c).

(iv) Exposure scenarios not covered in the screening values shall be evaluated separately and added to the cumulative effects risks. Evaluations may include the vapor intrusion pathway if it is determined to be complete using the vapor intrusion screening levels.

(v) Other receptors relevant to the industrial or commercial land use or both scenario, such as a trespasser or recreational user, shall be evaluated.

(vi) An ecological evaluation, as identified in Subsection R315-101-5(j), shall also be completed as part of the screening industrial or commercial land use or construction worker, or both, risk evaluation.

(vii) A groundwater impact evaluation, as identified in Subsections R315-101-5(f)(8) and R315-101-4(f)(15), shall also be completed as part of the screening industrial or commercial land use or both risk evaluation.

(8) For evaluation of potential future impacts to groundwater one or more of the following steps shall be used:

(i) Step 1. Compare the maximum detected concentration for constituents of potential concern in soil to the US EPA Regional Screening Levels, groundwater protection soil screening level based on a dilution attenuation factor of 20, unless it may be demonstrated that background levels for the contaminants of concern at the site exceed the applicable soil screening levels. If the maximum detected concentrations exceed the US EPA Soil Screening Levels for groundwater protection, the potential exists for future impacts to groundwater. The groundwater protection soil screening level value shall be the greater of either the maximum contaminant level or the risk-based groundwater protection soil screening level value for evaluation. If the potential for future groundwater contamination exists, the responsible party may provide additional lines of evidence and a re-evaluation using a refined exposure point concentration of the 95% upper confidence limit. If sufficient data are not available to calculate a 95% upper confidence limit, the maximum constituent of potential concern concentration value shall be used for evaluation, or the director may approve an alternate value; or

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(ii) Step 2. Derive a site-specific dilution attenuation factor and a site-specific groundwater protection soil screening level value. The development of the site-specific dilution attenuation factor shall follow "Supplemental Guidance for Developing Soil Screening Levels," US EPA, as incorporated by reference in Section R315-101-12. If the 95% upper confidence limit concentration exceeds the calculated groundwater protection soil screening level, the potential exists for future impacts to groundwater. The groundwater protection soil screening level value shall be the greater of either the maximum contaminant level or the risk-based groundwater protection soil screening level value for evaluation. If the potential for future groundwater contamination exists, the responsible party may choose to submit a work plan for approval by the director describing actions that will be taken to protect groundwater from future impacts due to soil contamination. In addition, the work plan shall include a proposal for collection of sufficient monitoring data to evaluate both current and future groundwater conditions; or

(iii) Step 3. The responsible party shall propose an alternate method for evaluating potential future impacts to groundwater due to soil contamination to the director for approval. If it is determined that the potential for future groundwater contamination exists, the responsible party shall submit a work plan for approval by the director describing actions that will be taken to protect groundwater from future impacts due to soil contamination. In addition, the work plan shall include a proposal for collection of sufficient monitoring data to evaluate both current and future groundwater conditions.

(g) Tier 2 refined risk assessment. A Tier 2 refined risk assessment shall be conducted using the methodologies described in the "US EPA Risk Assessment Guidance for Superfund Sites," Parts A to F, as incorporated by reference in Section R315-101-12, and following standard land use exposure assumption scenarios listed in Subsections R315-101-5(g)(1) and R315-101-5(g)(2):

(1) Residential Land Use.

(i) child receptor; and

(ii) adult receptor

(2) Non-residential Land Use.

(i) commercial or industrial or both;

(ii) construction worker; and

(iii) trespasser or recreationalist as applicable.

(3)(i) The Tier 2 risk assessment shall assume no institutional or engineering controls in place, such as security, signage, pavements, personal protective equipment, fences or remediation.

(ii) The risk assessment shall use US EPA standard default exposure parameters, variables and equations based on reasonable maximum exposure in the evaluation, unless scientific evidence suggests otherwise. If a US EPA standard default exposure parameter or variable is not available, the responsible party shall use the "Exposure Factors Handbook," US EPA, as incorporated by reference in Section R315-101-12, for default values, or other sources as approved by the director.

(iii) A refined risk assessment may be conducted using site-specific exposure parameters and a Monte Carlo simulation in a probabilistic risk analysis with the approval of the director.

(4) Evaluations shall be conducted in accordance with US EPA approved standards and methodologies and other methodologies as approved by the director. This may include the following guidance:

(i) "Guidelines for the Health Risk Assessment of Chemical Mixtures," Risk Assessment Forum, EPA/630/R-98/002, as incorporated by reference in Section R315-101-12;

(ii) "Risk Assessment Guidance for Superfund Volume 1: Human Health Evaluation Manual (Parts A-F)," Office of Emergency and Remedial Response EPA/504/1-89/002, Interim Final, as incorporated by reference in Section R315-101-12;

(iii) "Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors," US EPA OSWER Directive 9200.1-20, as incorporated by reference in Section R315-101-12;

(iv) "Supplementary Guidance for Conducting Health Risk Assessment of Chemical Mixtures," US EPA, as incorporated by reference in Section R315-101-12;

(v) "Soil Screening Guidance Technical Background Document," US EPA and "Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites," US EPA, as incorporated by reference in Section R315-101-12;

(vi) "Guidelines for Carcinogen Risk Assessment," EPA/630/P-03/001F, as incorporated by reference in Section R315-101-12;

(vii) "Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens," EPA/630/R-03/00F, as incorporated by reference in Section R315-101-12;

(viii) "OSWER Technical Guidance for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air," US EPA OSWER 9200.2-154, as incorporated by reference in Section R315-101-12;

(ix) "Technical Guide for Addressing Petroleum Vapor Intrusion At Leaking Underground Storage Tank Sites," US EPA, as incorporated by reference in Section R315-101-12; and

(x) "Risk Assessment Guidance for Superfund, Part A, Volume III, Process for Conducting Probabilistic Risk Assessment," US EPA 540-OR-02-002 OSWER 9285.7-45 PB 2002 963302, as incorporated by reference in Section R315-101-12.

(5) In performing the Tier 2 risk assessment, the responsible party shall use toxicity information for carcinogenic and non-carcinogenic effects in accordance with Subsections R315-101-5(i) and R315-101-5(j)(8).

(6) Risk characterization shall identify carcinogenic risks and non-carcinogenic risks for the constituents of potential concern.

(7) The age dependent adjustment factors shall be applied to carcinogens with a mutagenic mode of action.

(8) Risk characterization shall be based on cumulative risk effects and assumption of additivity in the absence of adequate evidence of toxicological interactions as follows.

(i) For non-carcinogenic toxicants acting by similar modes of action or affecting common organs, dose addition shall be followed.

(ii) For carcinogenic risks or toxicants acting independently, response addition shall be followed.

(9) Carcinogenic cumulative risk may also be calculated as the sum of the probabilities of each chemical across the exposure pathways for cumulative risks less than 0.01. For cumulative risks greater than 0.01, the One-Hit Model, as specified in "Risk Assessment

Guidance for Super Fund Volume 1: Human Health Evaluation Manual," Part A, US EPA, Office of Emergency and Remedial Response EPA/504/1-89/002, Interim Final, as incorporated by reference in Section R315-101-12, shall be used.

(10) Non-carcinogenic hazard indices shall be calculated as the sum of the non-carcinogenic effects for each chemical across the exposure pathways. However, if the hazard index is greater than one, the hazard quotients should be summed separately by target organ or mode of action.

(11) If total petroleum hydrocarbons are present, the risk assessment shall be evaluated using indicator compounds, and shall be conducted in accordance with Subsections R315-101-5(f), R315-101-5(f)(8), R315-101-5(g), R315-101-5(j), "Supplementary Guidance for Conducting Health Risk Assessment of Chemical Mixtures," EPA/630/R-00/002, as incorporated by reference in Section R315-101-12, and the US DOE Risk Assessment Information System website, and in accordance with other procedures approved by the director.

(i) The cumulative risk of the petroleum mixture shall assume additivity, dose addition or response addition, unless there is data suggesting toxicological interaction.

(ii) The risk assessment shall be based on the conceptual site model identified in Subsection R315-101-4(a)(3) or R315-101-4(f)(13) as applicable.

(12) Current and future anticipated land use scenarios evaluation.

(i) The evaluation shall be based on current and reasonably anticipated future uses of the property. Sources of information on land uses may include:

(A) current zoning and comprehensive plan maps and applicable regulations provided by the local jurisdiction for the properties within the locality of the site;

(B) inquiries made and responses as to whether there are regional trends that are relevant to land uses and activities in the locality of the site;

(C) inquiries made of any environmental protection zones or regulations; and

(D)(I) the property owner's planned use of land.

(II) An inactive or vacant, fenced or non-fenced, property with no proposed land use in an area zoned for industrial or commercial land use or both shall be assumed to be reasonably used for industrial or commercial use or both in the future.

(III) An inactive or vacant, fenced or non-fenced, property in an area zoned for residential land use shall be assumed to be reasonably used for residential land use in the future.

(IV) For the protection of human health and the environment, if future anticipated land use conditions offer a more protective exposure scenario than the current land use scenario, the more protective future anticipated land use shall be evaluated.

(V) A summary of the results and conclusions along with supporting documentation as to what the current and reasonably anticipated future land uses are for parcels within the locality of the site shall be submitted with the Tier 2 refined risk assessment for approval.

(h) Data and results presentation.

(1) A risk assessment report shall be submitted to the director for review and approval. The report may be a stand-alone document or included in a site characterization or closure report. The risk assessment, whether submitted by itself or included in a larger report, shall include, at a minimum, the following:

(i) an executive summary;

(ii) an overview of the site;

(iii) a detailed discussion of areas of contamination;

(iv) an exposure assessment identifying exposure levels for the exposure pathways identified in Subsections R315-101-5(c) and R315-101-5(j)(4)(i);

(v) if fate and transport models are used, the user's manual, model theory, computer software for the model, installation verification data set for the model and input files for the model runs shall be provided upon request by the director;

(vi) the output results of the model runs;

(vii) background levels of identified hazardous constituents including any statistical methods used in evaluation of background data;

(viii) identification and concentration of the contaminants of interest identified in Subsection R315-101-4(f)(8);

(ix) a list of constituents of potential concern, contaminants of concern, and contaminants with mutagenic mode of action for human health and constituents of potential ecological concern;

(x) US EPA Regional Screening Levels or, when US EPA Regional Screening Levels are not used, the toxicity information of identified constituents of potential concern, specifically listing mutagenic constituents of potential concern, including slope factors, inhalation unit risks, weight-of-evidence classification, non-carcinogenic chronic reference doses, age dependent adjustment factors, chronic reference concentrations and critical effects associated with reference doses and reference concentrations, toxicity reference values and any other ecological benchmarks used in the risk assessment;

(xi) a list of identified ecological receptors;

(xii) a list of identified ecological habitats;

(xiii) risk characterization calculations including data used; and

(xiv) the risk characterization identifying carcinogenic risk and non-carcinogenic risk for the constituents of potential concern, ecological hazard indices as determined in accordance with Subsection R315-101-5(j), uncertainties analysis, and a tabulation of the risk characterization data presented in a format approved by the director.

(2) If the risk assessment report does not contain the required information of sufficient quality and detail, the director will notify the responsible party in writing of deficiencies and shall require resubmittal of the report in a designated time frame.

(3) If the risk assessment report contains the required information of sufficient quality and detail, the director will approve, the risk assessment report in writing.

(i) Identification of sources of toxicity information.

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(1) Sources of toxicity information gathered for identified hazardous constituents, weight-of-evidence classification and critical effects associated with reference doses and reference concentrations shall be in order of preference based on the US EPA hierarchy of human health toxicity values tiered system, "Human Health Toxicity Values in Superfund Risk Assessment," US EPA OSWER Directive 9285.7-53, as incorporated by reference in Section R315-101-12. The approved hierarchy, in order of acceptance is as follows:

(i) US EPA Integrated Risk Information System.

(ii) US EPA Provisional Peer Reviewed Toxicity Values.

(iii) Additional sources may include US EPA and non-US EPA sources of toxicity information with priority given to sources that have been peer reviewed including the following:

(A) California Environmental Protection Agency toxicity values;

(B) Agency for Toxic Substances and Disease Registry Minimal Risk Levels;

(C) US EPA additional sources; or

(D) US EPA Health Effects Assessment Summary toxicity data.

(2) US EPA Regional Screening Levels; and

(3) US DOE Risk Assessment Information System website.

(j) Ecological risk assessment.

(1) Before conducting the risk assessment, the responsible party shall submit a work plan for approval.

(2) An ecological risk assessment for the site shall include terrestrial and aquatic processes as appropriate using toxicity information for the constituents and biological processes relevant to the ecological evaluation. This shall include plants, soil invertebrates, benthic invertebrates, wildlife species and other ecological receptors as approved by the director. A list of all ecological receptors of interest shall also be included.

(3) A waiver of Subsection R315-101-5(j) may be granted by the director if the responsible party demonstrates that ecological receptors will not be affected by any contamination using any of the following criteria:

(i) environmental conditions at the site may be used to eliminate the need for ecological risk assessment;

(ii) the affected property is not a viable habitat and the site cannot be used by potential ecological receptors as a habitat;

(iii) complete or potentially complete exposure pathways do not exist due to prevailing conditions or property setting; or

(iv) detected chemicals at the site are below the ecological screening benchmark levels.

(4) An ecological risk assessment for a site shall be conducted to include the following information:

(i) a problem formulation, identification of constituents of potential ecological concern, identification of habitats, media sampled, potential ecological effects, relevant ecological receptors, relevant exposure pathways, initial definition of assessment and measurement endpoints, with respect to current and reasonably anticipated future land and water uses as described in a conceptual site model;

(ii) the data quality objectives for the ecological risk assessment shall be based on the conceptual site model, with emphasis on analytical detection limits appropriate for ecological receptors;

(iii) an exposure analysis to include identification and selection of constituents of potential ecological concern, identification and selection of target or representative ecological receptors, an exposure pathway model relating target or representative receptors, exposure routes and measurement endpoints for both current and reasonably anticipated future land and water use scenarios;

(iv) an ecological response analysis including a summary of current information regarding the toxicological effects, ecological effects, bioconcentration potential, bioaccumulation potential, biomagnification potential, persistence of the identified constituents of potential ecological concern and ecological benchmark values;

(v) a risk characterization presenting the quantitative ecological risks potentially associated with the site, a discussion of any available site-specific ecological studies, a detailed discussion of risks associated with the bioconcentration potential, bioaccumulation potential, biomagnification potential, and persistence of each contaminant, and consideration of any other available, published and peer reviewed scientific information on other sources of adverse ecological conditions as appropriate;

(vi) an evaluation of the potential for significant adverse effects on the health or viability of individual ecological receptors or local populations, including a weight-of-evidence analysis or population viability analysis. These evaluations may include field studies, laboratory investigations, appropriate population models, or any combination of these or other methods of evaluation as approved by the director; and

(vii) a quantitative and qualitative uncertainty analysis as appropriate for each element of the risk assessment.

(5) Ecological risk assessment estimates shall be conducted:

(i) at the individual level for species present in the locality of the site if the species is listed as threatened or endangered, or is a state sensitive species; and

(ii) at the population level for any other species of plants or animals in the locality of the site.

(6) Cumulative hazard from multiple hazardous substances shall be assessed by summing the hazards posed separately by individual hazardous substances in the locality of the site, unless it is demonstrated that the summation assumption is not appropriate.

(7) Ecological risk assessment shall be conducted in accordance with the following:

(i) "Framework for Ecological Risk Assessment," EPA/630/R-92/001, as incorporated by reference in Section R315-101-12;

(ii) "Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments Interim Final," EPA 540-R.97-006, OSWER 9285.7-25. PB97-963211, as incorporated by reference in Section R315-101-12;

(iii) "Guidelines for Ecological Risk Assessment," US EPA, as incorporated by reference in Section R315-101-12;

(iv) US EPA "Guidance for Developing Ecological Screening Levels," US EPA, as incorporated by reference in Section R315-101-12; and

(v) any other sources as approved by the director.

(8) Appropriate sources of exposure factor information and toxicological parameters may include the following:

(i) "Wildlife Exposure Factors Handbook," US EPA, as incorporated by reference in Section R315-101-12;

- (ii) "Toxicological Benchmarks for Wildlife," Oak Ridge National Laboratory (ORNL), as incorporated by reference in Section R315-101-12;
  - (iii) Los Alamos National Laboratory (LANL) ECORisk Database;
  - (iv) US EPA Ecological Soil Screening Levels;
  - (v) "Guidance for Developing Ecological Soil Screening Levels," US EPA, as incorporated by reference in Section R315-101-12;
- and

(vi) any other sources as approved by the director.

(9) In the absence of available and acceptable toxicity information, the director may require the development of site-specific toxicity information.

(10) An ecological risk assessment shall be conducted using a tiered evaluation approach as described in Subsections R315-101-5(j)(10)(i) through R315-101-5(j)(10)(x).

(i) A Tier 1 ecological screening risk assessment shall use conservative assumptions and shall include:

- (A) a conceptual site model;
- (B) an evaluation of fate and transport mechanisms;
- (C) an identification of constituents of potential ecological concern;
- (D) a characterization of the ecological setting; and
- (E) a selection of toxicity endpoints and receptors of ecological significance.

(ii) Tier 1 ecological screening risk assessment - exposure pathways:

(A) each ecological receptor is considered to be exposed to constituents of potential ecological concern in soil in the zero to two feet below ground surface interval. In addition, burrowing animals and deep-rooted plants may be considered to be exposed to constituents of potential ecological concern in soils deeper than two feet; and

(B) exposure pathways may include ingestion, direct contact, exposure through uptake of biota exposed to constituents of potential ecological concern, and plant uptake of constituents of potential ecological concern.

(iii) The exposure assessment for the Tier 1 ecological screening risk assessment shall be conducted by assuming:

- (A) the maximum detected concentrations as the exposure point concentration for calculating exposure doses;
- (B) the area use factor is equal to one indicating that the home range of the receptor is the entire contaminated area;
- (C) the bioavailability of contaminants is equal to 100%;
- (D) the maximum reported ingestion rate from literature;
- (E) the dietary composition consists of direct ingestion of 100% of the constituents of potential ecological concern levels in soil;
- (F) each calculation is performed on a dry-weight basis; and
- (G) minimum receptor body weight.

(iv) The toxicity assessment for the Tier 1 ecological screening risk assessment shall be conducted by assuming:

(A) for wildlife, the dose-based toxicity reference values, which are receptor, media, and chemical specific, shall be the applicable protective standards available in peer reviewed literature sources;

(B) the toxicity reference values selected shall be those based on no observed adverse effects levels for evaluation;

(C) the responsible party may use a literature search to determine availability of data for derivation of a toxicity reference value if detected constituents of potential ecological concern have no published toxicity reference values, and shall provide the following:

(I) the responsible party shall provide supporting data to the director for approval of the newly derived toxicity reference value; and

(II) if the responsible party cannot derive a toxicity reference value based on literature, the detected constituents of potential ecological concern shall be addressed qualitatively in the uncertainty analysis of the ecological risk assessment report;

(D) for plants and other invertebrate receptors, such as soil organisms, benthic organisms and aquatic organisms, concentration-based effects benchmarks shall be used:

(I) concentration levels identified in peer reviewed literature sources shall be used as measurement endpoints for evaluation of chemical effects on receptors;

(E) the effects concentration levels shall be the no observed effects concentrations; and

(F) the responsible party may use a literature search to determine availability of data for derivation of effects concentration levels if detected constituents of potential ecological concern have no published effects concentration levels:

(I) the responsible party shall provide supporting data to the director for approval of the newly derived effects concentration levels;

and

(II) if the responsible party cannot derive effects concentration levels based on literature, the detected constituents of potential ecological concern shall be addressed qualitatively in the uncertainty analysis of the ecological risk assessment report.

(v) The risk characterization of the Tier 1 ecological screening risk assessment.

(A) For plants and other invertebrate receptors, a screening hazard quotient, shall be calculated as the maximum detected exposure concentration of constituents of potential ecological concern divided by the no observed effects concentration.

(B) For wildlife, a screening hazard quotient shall be calculated as the estimated exposure dose or contaminant intake divided by the no observed adverse effects level-based toxicity reference value.

(C) Tier 1 screening results.

(I) If the calculated screening hazard quotient or hazard index is less than or equal to one, no further evaluation is required.

(II) If the calculated screening hazard quotient or hazard index is greater than one, then there may be the potential for adverse ecological risk from the detected constituents of potential ecological concern at the site. The responsible party shall either conduct corrective action or conduct further evaluation in a Tier 2 refined ecological risk assessment.

(vi) A Tier 2 refined ecological risk assessment shall:

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(A) use constituents of potential ecological concern with screening hazard quotients or hazard indices greater than one for a refined problem formulation; and

(B) use site-specific exposure assumptions in Subsections R315-101-5(j)(10)(ii) and R315-101-5(j)(10)(iii) for the refined evaluation.

(vii) The exposure assessment in the Tier 2 refined ecological risk assessment shall include exposure dose calculated utilizing site-specific exposure assumptions as follows:

(A) exposure point concentration:

(I) calculate exposure point concentration as the 95% upper confidence limit if sufficient data are available in accordance with US EPA ProUCL software; and

(II) if sufficient data are not available to calculate the 95% upper confidence limit, an alternate value, as approved by the director, shall be used as the exposure point concentration;

(B) estimate the site-specific area use factor for each representative receptor by dividing the receptor's average home range by the area of contamination or area of the solid waste management units:

(I) this estimate shall have a value between zero and one;

(C) the bioavailability of constituents of potential ecological concern shall be assumed to be other than 100% based on available literature or other sources as approved by the director;

(D) the ingestion rate for each representative receptor shall be assumed to be the average reported ingestion rate in reported literature or estimated from average body weight using allometric equations;

(E) the dietary composition shall be based on receptor specific percentages of plant, animal, and soil matter:

(i) the non-dietary ingestion of soil shall be assumed to be in addition to the dietary intake rate to add up to 100%, soil and dietary items;

(F) the concentrations of constituents of potential ecological concern in receptor dietary elements, plant and animal matter, shall be predicted by using bio uptake and bioaccumulation models;

(G) each calculation shall be performed on a dry-weight basis;

(H) if a bioaccumulation model is not available, 100% uptake factor shall be assumed;

(I) each equation and variables used to estimate constituents of potential ecological concern in plants shall be listed;

(J) the methodologies for determination of bioaccumulation factors for the constituents of potential ecological concern shall be documented; and

(K) exposure doses for wildlife receptors shall be assessed using bio uptake and bioaccumulation modeling to predict the concentration of constituents of potential ecological concern in animal matter that may be ingested by wildlife receptors.

(viii) The toxicity assessment for a Tier 2 refined ecological risk assessment shall be based on:

(A) the lowest observed adverse effects levels for wildlife receptors and lowest observed effects concentrations for plants and invertebrate receptors; and

(B) the toxicity reference values shall be based on the lowest observed adverse effects levels for each wildlife receptor and shall be based on lowest observed effects concentrations for any other receptors including invertebrates, with the exception of endangered, threatened and sensitive species for which a no observed adverse effects level applies.

(ix) The risk characterization of the Tier 2 refined ecological risk assessment.

(A) For wildlife vertebrate receptors, a hazard quotient shall be calculated as the ratio of the estimated receptor-specific contaminant intake or dose to the lowest observed adverse effects level-based toxicity reference value.

(B) For plants and other invertebrate receptors, a qualitative discussion of the potential for adverse effects shall be provided in the assessment. The assessment shall be based on plant hazard quotients or hazard indices as well as site observations that were made during a habitat survey.

(C) Hazard quotients shall be summed for the constituents of potential ecological concern with similar receptor-specific modes of toxicity.

(D) Tier 2 assessment results.

(I) If the hazard quotient or the hazard index is less than or equal to one, adverse ecological effects are not expected and no further action is needed.

(II) If the hazard index is greater than one, there is potential for adverse ecological effects to occur at the site and the responsible party shall either conduct corrective action or conduct further evaluation in a Tier 3 refined ecological risk assessment as outlined in Subsection R315-101-5(j)(10)(x).

(x) A Tier 3 refined ecological risk assessment shall be conducted based on:

(A) a site-specific ecological evaluation;

(B) uptake factors, bioaccumulation factors, bioavailability factors, and plant uptake factors determined from the analysis of animal and plant tissue collected at the site;

(C) the evaluation of unique exposure pathways and effects of exposure to various life stages or other assessment endpoints as determined by the director;

(D) the evaluation of habitat suitability including habitat quality; and

(E) the calculation of refined hazard quotients and hazard indices for the constituents of potential ecological concern shall take into account information from Subsections R315-101-5(j)(10)(i) through R315-101-5(j)(10)(x).

(xi) Tier 3 refined ecological risk assessment results and possible outcomes.

(A) If the Tier 3 refined evaluation results in a hazard index greater than one, the responsible party, shall, in conjunction with the results of a Tier 2 refined evaluation, use several lines of evidence and a weight-of-evidence approach to facilitate a final determination regarding the need for corrective action.

(B) Site remediation shall be required if unacceptable or potential significant adverse ecological effects are documented by the risk assessment results.

(C) The director has the discretion to require corrective action at the site based on data and ecological significance as reported.

(11) Results presentation.

An ecological risk assessment report shall be prepared and submitted to the director in accordance with the requirements in Subsection R315-101-5(h).

**R315-101-6. Corrective Action.**

(a) Corrective action is required at a site when:

(1) the level of risk present at the site is greater than  $1 \times 10^{-4}$  for carcinogens or a hazard index greater than one for non-carcinogens for the risk assessment conducted assuming the land use exposure scenario defined in Subsection R315-101-5(g)(1) or R315-101-5(g)(2);

(2) the director determines that ecological effects are significant based on the approved assessment conducted in accordance with Subsection R315-101-5(j); or

(3)(i) groundwater contamination is exceeded, on-site or off-site, in accordance with Subsection R315-101-4(f)(15) or groundwater contaminant concentrations have been shown to be above a corrective action level using a statistical corrective action test in accordance with "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities" US EPA Unified Guidance, as incorporated by reference in Section R315-101-12, or the "Groundwater Statistics and Monitoring Compliance Guidance Document," Interstate Technology Regulatory Council (ITRC), as incorporated by reference in Section R315-101-12; or

(ii) residual contamination present at the site poses a potential threat to groundwater in accordance with Subsection R315-101-5(f)(8) and "Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites," US EPA, as incorporated by reference in Section R315-101-12, and "Soil Screening Guidance Technical Background Document," US EPA, as incorporated by reference in Section R315-101-12.

(b) The responsible party shall submit a corrective action work plan that includes the responsible party's proposed remedial option for cleanup of the site for review and approval before implementation of the corrective action activities at the site. Determination of appropriate corrective action measures shall be made in accordance with criteria identified in Subsection R315-101-1(c). Any proposed modifications to the approved plan shall be reviewed and approved by the director before implementation of the proposed modification.

(c) Any corrective action levels proposed shall be protective of the complete exposure pathways or potentially complete exposure pathways for all receptors.

(d) The responsible party shall submit a corrective action report after completion of corrective action activities at the site to the director for review and approval.

(e) The corrective action report shall include a request for a corrective action completeness determination from the director.

**R315-101-7. Risk Management: Site Management Plan and Closure Equivalency.**

(a) A determination of no further action or corrective action complete without controls or unrestricted land use or risk-based clean closure and no site management shall be approved when:

(1) the level of risk present at the site is less than or equal to  $1 \times 10^{-6}$  as the point of departure for carcinogens and the hazard index is less than or equal to one for non-carcinogens based on the approved risk assessment conducted assuming the land use exposure scenario defined in Subsection R315-101-5(g)(1);

(2) the director determines that ecological effects as the site are insignificant based on the approved assessment conducted in accordance with Subsection R315-101-5(j); and

(3) current impacts to groundwater are insignificant in accordance with Subsection R315-101-4(f)(15) and residual contamination present at the site possess no future threat to groundwater in accordance with Subsection R315-101-5(f)(8) and "Soil Screening Guidance Technical Background Document," US EPA, as incorporated by reference in Section R315-101-12, or groundwater contaminant concentrations have been shown to be below a corrective action level using statistical corrective action test in accordance with "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities," US EPA Unified Guidance, as incorporated by reference in Section R315-101-12 or the "Groundwater Statistics and Monitoring Compliance Guidance Document," Interstate Technology Regulatory Council (ITRC) as incorporated by reference in Section R315-101-12, as applicable.

(b) ~~The director may make a [A-]determination of either corrective action complete with controls or restricted land use [along with a site management plan shall be approved]~~ when:

(1) the level of risk present as the site is greater than  $1 \times 10^{-6}$  but less than  $1 \times 10^{-4}$  for carcinogens and the hazard index is less than or equal to one for non-carcinogens based on the approved risk assessment conducted assuming the land use exposure scenario defined in Subsection R315-101-5(g)(1) or R315-101-5(g)(2); and

(2) clean closure is not supported by conclusions of either the site investigation or corrective action risk assessment.

(c) In making a determination of either corrective action complete with controls or restricted land use under Subsection R315-101-7(b), the director has the discretion to require a site management plan. If the director requires a site management plan, [The]the site management plan shall:

(1) be submitted within 60 days of approval of the risk assessment report and include a schedule for implementation;

(2) be supported by the findings in the approved risk assessment report and contain appropriate site management activities;

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(3) encompass any activities, controls and conditions necessary to manage the risk to human health and the environment so that acceptable risk levels are not exceeded under current or reasonably anticipated future land use conditions;

(4) ensure that the assumptions made in the estimation of risk and applicable target risk levels are being met; and

(5) ensure that adverse ecological effects are controlled and managed so that documented hazard quotients and indices are less than or equal to one.

(d) Appropriate site management activities shall be measures and controls taken to manage and reduce risks greater than  $1 \times 10^{-6}$  but less than  $1 \times 10^{-4}$  under both current and reasonably anticipated future land use conditions, through land use controls, such as institutional controls and engineering controls, groundwater monitoring, post-closure care, or corrective action as determined by the director on a case-by-case basis as defined in Subsection R315-101-13(f).

(e) The site management plan shall be reviewed and approved by the director before implementation of the plan. Before approval, the site management plan shall be subject to the public notice requirements of Section R315-101-10.

(f)(1) If the director finds that the site management plan is not adequate for protection of human health and the environment, the responsible party shall resubmit a revised site management plan addressing the comments of the director within an appropriate time frame as specified by the director. The director shall review and approve or reject the revised site management plan. The responsible party shall resubmit the site management plan addressing the deficiencies in a time frame specified by the director.

(2) The site management plan shall be implemented in accordance with the approved schedule.

(g)(1) Upon completion of the requirements in Subsection R315-101-7(a), corrective action shall be considered complete without controls and the land is acceptable for unrestricted use.

(2) The requirements of Subsections R315-270-1(c)(5) and (6) shall be deemed met if Subsection R315-101-7(a) is met.

(h) The site management plan shall include a land use control plan that specifies allowable and prohibited use of the site.

(i) Land use controls shall guarantee that pathways of exposure to contaminants of concern remain incomplete for as long as there are hazardous wastes or hazardous waste constituents remaining that could pose an unacceptable risk to human health and the environment.

(j) Land use controls shall be reliable, enforceable, and consistent with the risk posed by the contaminants of concern as documented in the approved risk assessment report. Land use controls may include engineering controls such as capping, paving, vapor barriers, fencing, signage, site security, and institutional controls, such as post-closure care and land use restrictions, as determined on a case-by-case basis and approved by the director.

(k) In instances where contamination, including groundwater, has migrated off-site, and the director determines that the contaminant concentration poses a potential risk exceeding the acceptable risk level for residential land use exposure scenario defined in Subsection R315-101-5(g)(1), the responsible party shall:

(1) Submit a proposed written notice of contamination to the director for approval before its distribution to the off-site property owners affected or potentially affected by the contamination.

(i) The written notice shall at a minimum, include the following:

(A) names of the contaminants detected above applicable screening levels;

(B) the corresponding screening levels;

(C) the respective detected contaminant concentrations; and

(D) adverse effects on human health and the environment.

(2) Notify the off-site property owners, in writing, within 30 days of director approval of written notice.

(3) Provide the director with a certified mail return receipt, or any other form of delivery that provides confirmation of receipt.

(4) With the property owner's consent, and with the director's approval, conduct corrective action in accordance with Section R315-101-6 to reduce concentrations of constituents of concern on the property to or below residential land use exposure scenario defined in Subsection R315-101-5(g)(1) or R315-101-4(f)(15) as applicable, if it is determined by the director that the action is necessary for protection of human health and the environment, or that groundwater use is designated as a drinking water source or is potentially a drinking water source; or

(5) If groundwater contamination has migrated off-site but Subsections R315-101-7(k)(1) through R315-101-7(k)(4) are not applicable, the responsible party shall inform the off-site property owner in writing of the contamination, as required by Subsection R315-101-7(k)(1), and with the property owner's consent, and with the director's approval, conduct corrective action in accordance with Section R315-101-6 to reduce concentrations of contaminants of concern on the off-site property to non-residential land use exposure levels consistent with the requirements of Subsection R315-101-5(g)(2) and the designated groundwater use, and develop a site management plan in accordance with Section R315-101-7. The responsible party shall prepare and obtain the director's approval for an environmental covenant concerning the property. The responsible party shall request the property owner to record the environmental covenant and document to the director its efforts to have the environmental covenant recorded.

(l) If the responsible party cannot gain access to further characterize the off-site property, or to assess and manage risks, or to conduct corrective action on the off-site property, the responsible party shall:

(1) document each attempt to gain access to the off-site property, and obtain concurrence from the director that the attempts made were reasonable and that no further attempts need to be made;

(2) meet the applicable target risk levels or some approved groundwater protection standards at the boundary of the site; and

(3) with a site management plan approved by the director, take the necessary actions to prevent further migration of contaminants of concern beyond the site boundary.

(m) For impacts to off-site groundwater, surface water bodies and sediments, and other media, the corrective action levels shall be protective of each receptor, human and ecological, for each current and potential future exposure pathway.

(n) The site management plan in Subsections R315-101-7(k)(5) and R315-101-7(l)(3) addressing off-site and site groundwater contamination respectively, shall include the activities and conditions necessary to address current and potential future impacts to groundwater. The proposed controls and measures shall be consistent with Section R315-101-3 and prevent further ground water degradation at the site or off-site property so that risks are controlled, reduced or maintained at levels within the acceptable risk range as defined in Subsection R315-101-13(c).

(o) Once the site management plan as specified in Subsection R315-101-7(b), R315-101-7(k)(5) or R315-101-7(l)(3) as applicable has been approved by the director, the contamination level shall not be allowed to exceed the level of risk specified in the plan. The responsible party has the burden to demonstrate that future levels of contamination at either the site or off-site property or both are either below or within the range of risk levels specified in the site management plan.

(p) If the responsible party cannot demonstrate that the level of contamination at either the site or off-site property or both is either below or within the range of risk levels specified in the site management plan, then further corrective action may be required as determined by the director to bring the risk levels to within the acceptable risk range as specified in the site management plan. A revised site management plan may be required by the director.

(q) In instances where contaminated groundwater has been determined by the director as having no complete exposure pathways and there is no migration of the contaminated plume off-site, or when the director has approved a claim of technical impracticability for corrective action, then, instead of meeting specific cleanup levels, the acceptable management goals and remedy, shall be the following:

- (1) source control of releases of contaminants that may pose a threat to human health and the environment;
- (2) protection of human health and the environment from any potential exposure pathways to contaminated groundwater;
- (3) long-term plume containment system for protection of human health and the environment;
- (4) perpetual care obligation of the responsible party;
- (5) periodic groundwater monitoring, unless terminated by the director after an evaluation of the site-specific conditions and risk characteristics, to demonstrate that contaminant levels are not increasing and the groundwater plume is stationary; and
- (6) periodic re-evaluation of the technical impracticability decision as part of routine performance monitoring to ensure long-term protection of human health and the environment.

**R315-101-8. Contents of a Site Management Plan, Land Use Controls, Environmental Covenants, Restrictions, Controls and Conditions.**

(a) ~~If a site management plan is required, [The content of the site management plan. The]~~the site management plan ~~[to be approved by the director]~~ shall contain at a minimum:

- (1) a legal description of the site including a legal plat map, a copy of the recorded deed showing ownership, and documents showing all liens;
- (2) a summary of the media investigations conducted at the site including the characterization, delineation and listing of identified constituents of potential concern and contaminants of concern;
- (3) a summary of the completed human health risk assessment and ecological risk assessment performed in accordance with Section R315-101-5;
- (4) an implementation schedule of the site management plan within the site;
- (5) a description of the groundwater conditions under the site and within the impacted aquifer, as defined in a site characterization report and including activity and use limitations for potable, culinary, domestic, process, irrigation or any other groundwater uses;
- (6) a complete list of the persons or entities that have rights of reasonable access to the site at any time after the effective date of the site management plan for activities such as monitoring and compliance with the site management plan, along with any other terms and conditions of the site management plan;
  - (i) the site management plan shall also indicate that persons with legal interest in land and those subject to the site management plan are required to allow compliance with the site management plan;
  - (7) provisions that the director, and the director's authorized officers, employees, or representatives may at any reasonable time and upon presentation of appropriate credentials, have access to the site to monitor, sample or determine compliance with the site management plan or environmental covenant;
  - (8) a list of the contact names and information for site management plan inquiries; and
  - (9) a general description of any site-specific groundwater monitoring including:
    - (i) a general overview of the proposal;
    - (ii) a summary of site groundwater conditions; and
    - (iii) the current and potential uses of groundwater and the contaminants of concern.

(b) Activities related to monitoring potential contamination of the groundwater at the site shall be conducted under an approved groundwater monitoring plan. The responsible party shall submit a draft plan to the director and shall not proceed with any portion of the plan until the director has given written approval.

(1) Based on the results of the groundwater monitoring, the potential need for additional site management activities shall be evaluated and implemented, if necessary, to protect human health and the environment. Groundwater monitoring shall be the responsibility of the property owner and its assignees.

(c) If an existing groundwater monitoring well is lost, abandoned, destroyed, or needs to be relocated for development purpose, the owner shall replace the wells in an area that provides the groundwater data required by the site management plan. Any proposal to replace groundwater monitoring wells requires review and approval by the director. If drinking water wells are proposed, the responsible party shall provide prior notice to the director after obtaining either any necessary permits approval or both for the installation of the proposed drinking water wells by the appropriate state, local or other regulatory agencies.

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(d) Site management plan modification and termination. The site management plan shall be subject to review and may be terminated or modified as follows.

(1) If groundwater sampling data within the site or off-site property indicates that approved groundwater corrective action levels found in Subsections R315-101-4(f)(15), R315-101-6(a)(3)(i), and R315-101-7(k)(4), as applicable, have been met for the site or impacted off-site property, the responsible party may request modification or termination of the groundwater monitoring program, as follows:

(i) groundwater data shall be evaluated using a statistical corrective action test in accordance with the "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance," US EPA, or the "Groundwater Statistics and Monitoring Compliance Guidance Document," Interstate Technology Regulatory Council (ITRC), as incorporated by reference in Section R315-101-12;

(ii) a demonstration that future levels of contamination will not exceed the approved groundwater corrective action levels; and

(iii) land use controls, either engineering or institutional or both, shall be relied upon to ensure protection of human health and the environment if the approved corrective action levels are more than the drinking water standards, maximum contaminant levels.

(2) If soil sampling data, including soil vapor, within the site or off-site indicate corrective action levels as found in Section R315-101-6 have been met for the soil portion of the site, the owner may request a modification or termination of the section of the site management plan addressing soil management at the site or at an impacted off-site property.

(3) If the owner or responsible party satisfies Subsections R315-101-8(d)(1) and R315-101-8(d)(2) and, in addition, meets the requirements defined in Subsection R315-101-7(a), the owner may request a corrective action complete without controls determination or a no further action determination.

(4) If Subsection R315-101-8(d)(3) is satisfied, a request for termination of the site management plan and the environmental covenant may be submitted to the director for approval.

(5) The director may require public comment on any modifications or termination of the approved site management plan and environmental covenant in accordance with Section R315-101-10.

(6) The director may require a re-evaluation of the approved risk assessment, the site management plan and the environmental covenant upon receipt of new information or data that brings into question the protectiveness of the existing site management plan.

(e) Land use controls.

(1) The site management plan shall identify land use limitations for the site, such as residential, industrial, commercial, recreational, agricultural or any other comparable use with a similar level of human occupancy and exposure. The site management plan shall also identify the land use controls to be placed upon the site. Any subsequent plans for development of the site shall demonstrate to the director that the level of risk present for the proposed use shall not exceed the applicable risk levels specified in the site management plan.

(2) The site management plan shall contain as many land use controls, institutional and engineering, as is deemed necessary to protect human health and the environment. Controls may include maintaining pavement, capping, soil excavation restrictions, and groundwater use limitations. Each control shall be approved by the director.

(3) The proposed land use controls shall be developed and included in the site management plan.

(4) Land use controls shall be used at any site where cumulative carcinogenic risk exceeds a level of  $1 \times 10^{-6}$  but is less than  $1 \times 10^{-4}$  after cleanup or as indicated by the approved risk assessment report.

(5) Land use controls shall ensure that pathways of exposure to contaminants of concern remain incomplete for as long as there are contaminants of concern remaining that could pose an unacceptable risk to human health or the environment.

(6) Land use controls shall be enforceable pursuant to Section 57-25-111 and consistent with the risks posed by the contaminants of concern reported in the approved risk assessment report. The responsible party, or a subsequent landowner who assumes the responsibility of maintaining land use controls, shall be responsible for reimbursing the agency for any costs associated with periodic administrative oversight to ensure that land use controls are maintained and are in compliance with the site management plan. Costs shall not exceed the authorized statutory rate for technical oversight by the agency at the time of service.

(f) An environmental covenant. An environmental covenant pursuant to Sections 57-25-101 through 57-25-114 shall be required for each site unless it has been documented that any contaminants of interest at the site are at or below background levels or the following requirements have been met:

(1) the level of risk is less than or equal to  $1 \times 10^{-6}$  for carcinogens and the hazard index is less than or equal to one for non-carcinogens pursuant to the risk assessment conducted assuming the land use exposure scenario defined in Subsection R315-101-5(g)(1);

(2) the ecological effects have been determined to be insignificant; and

(3) there are no current or potential future impacts to groundwater.

(g) The content of the environmental covenant. The environmental covenant shall contain at a minimum:

(1) a brief narrative description of the contamination and remedy;

(2) a list of the constituents of potential concern and contaminants of concern;

(3) a list of the exposure pathways;

(4) the limits of exposure;

(5) the locations and extent of the contamination;

(6) a brief narrative description of land use limitations for the site;

(7) any groundwater use limitations;

(8) any ground surface use limitations; and

(9) any worker safety limitations.

(h) If a site management plan is required, and [For] for all legal interests in the subject property created after the recording of the environmental covenant and for all interests voluntarily subordinated to the environmental covenant, the environmental covenant shall indicate that persons with legal interest in land and those subject to the site management plan are required to maintain compliance with the site management plan.

(i) The environmental covenant shall include provisions that the director, and the director's authorized officers, employees, or representatives may at any reasonable time and upon presentation of appropriate credentials, have access to the site to monitor, sample or determine compliance with the site management plan or the environmental covenant.

(j) The terms and conditions of the land use controls established on the property shall be consistent with the environmental covenant recorded for the site.

(k) Within 30 days of the director signing the environmental covenant, the owner shall record the approved environmental covenant with the county recorder's office, and within 30 days of recording shall submit a copy of the recorded document to the director.

(l) Restrictions, controls and conditions. Restrictions, controls and conditions specified in the environmental covenant and the site management plan shall be enforceable by the director under Section 57-25-111 and Rule R315-101.

**R315-101-9. Owner Responsibilities.**

(a) The owner or responsible party shall ensure compliance with the environmental covenant and the land use restrictions such as groundwater use restrictions, soil removal restrictions, hazard notifications, implementation of the groundwater monitoring program, and any other restrictions or conditions cited in the environmental covenant, site management plan, or both. Documentation of compliance with the site management plan requirements shall be submitted to the director upon request.

(b) The owner or responsible party shall notify present and future workers at the site, including site workers and construction workers, of the residual risk at the site and the existence of controls outlined in the environmental covenant or the site management plan. ~~[This includes site workers present for a typical work week and construction workers who may be temporary. If the site management plan specifies controls to prevent workers from exposure, the]~~The owner or responsible party shall be responsible for implementing[provide] those controls, including any controls to prevent workers from exposure.

(c) Within 48 hours of becoming aware of a deviation from the land use controls and restrictions,[site management plan] the owner or responsible party shall notify the director of the deviation. The owner or responsible party shall submit to the director a written report within 30 days detailing the nature of the deviation and an evaluation of whether the situation and existing site management practices compromise the level of protection afforded by the environmental covenant or the[original] site management plan requirements and whether an alternate site management plan is needed to provide a comparable level of protection. Any proposed modification to the site management plan requirements shall require director approval.

(d) The environmental covenant shall run with the land and shall be binding on the current and all subsequent owners. If a site management plan is required, the[The] site management plan requirements shall be imposed and enforced on the current owner through an environmental covenant. Additionally, after the environmental covenant is recorded in the appropriate county recorder's office, each deed, title, or other instrument conveying an interest in the property executed by the owner or the owner's successors in title to the property shall include a notice stating that the property is subject to the [site management plan and] environmental covenant, and shall reference the recorded location of the [site management plan and] environmental covenant and the restrictions applicable to the property,[-in the site management plan.]

(e) In instances where groundwater contamination has migrated off-site, and the director determines that the contaminant concentration poses a potential risk, the responsible party shall notify the impacted off-site property owners in accordance with Subsections R315-101-7(k) and R315-101-7(l).

(f) The responsible party, with the approval of the director, shall comply with Subsection R315-101-7(k)(4), R315-101-7(k)(5) or R315-101-7(l) as applicable.

**R315-101-10. Public Participation.**

(a) The director may provide for public participation in each phase of the cleanup action process, as defined in Sections R315-101-4 through R315-101-7.

(b) Before approving the site management plan, the director shall provide public notice for public comment periods and public hearings for the site management plan in accordance with Sections R315-124-10 through R315-124-12 and R315-124-17.

**R315-101-11. Administrative Oversight.**

(a) The director or the director's representatives shall have access to the site as described in Section R315-260-5 and at any time when activity pursuant to Rule R315-101 is taking place. The director or the director's representatives may collect environmental samples or document any visit to the site by photographic, or videographic or some other reasonable means.

(b) The director shall send an invoice to the responsible party for review of plans, reports or other technical documents submitted, contractor costs, laboratory costs and time spent on correspondence, telephone calls, meetings, field work, and any associated activities to meet the requirements of Rule R315-101.

(c) The owner shall pay any invoices it receives from the director in accordance with the instructions on the invoice.

(d) The responsible party shall notify the director at least seven days before any field work such as a sampling event or remediation activity.

(e) Information submitted to the director shall be signed by the responsible party.

**R315-101-12. Documents Incorporated by Reference.**

For purposes of Rule R315-101 regarding cleanup action and Risk-Based Closure Standards, the following documents are incorporated by reference.

(a) Interstate Technology Regulatory Council (ITRC), December 2013, "Groundwater Statistics and Monitoring Compliance" Guidance Document.

(b) Los Alamos National Laboratory (LANL), 2011, "ECORisk Database."

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- (c) Oakridge National Laboratory (ORNL), 1996, "Toxicological Benchmarks for Wildlife: 1996 Revision." ES/ER/TM-86/R3.
- (d) Oakridge National Laboratory (ORNL), May 1998, "A Guide to the ORNL Ecotoxicological Screening Benchmarks: Background, Development, and Application," ORNL/TM-13615.
- (e) United States Environmental Protection Agency (US EPA), 1986, "Guidelines for the Health Risk Assessment of Chemical Mixtures," Risk Assessment Forum, EPA/630/R-98/002.
- (f) United States Environmental Protection Agency (US EPA), 1989, "Risk Assessment Guidance for Super Fund Volume 1: Human Health Evaluation Manual (Part A)", Office of Emergency and Remedial Response EPA/504/1-89/002, Interim Final.
- (g) United States Environmental Protection Agency (US EPA), March 25, 1991, "Risk Assessment Guidance for Super Fund Volume 1: Human Health Evaluation Manual Supplemental Guidance Standard Default Exposure Factors." Interim Final. OSWER Directive 9285.6-03.
- (h) United States Environmental Protection Agency (US EPA), December 1991, "Risk Assessment Guidance for Super Fund Volume 1: Human Health Evaluation Manual (Part B, Development of Risk-based Preliminary Remediation Goals)," Office of Emergency and Remedial Response EPA/504/1-89/003, Interim Final.
- (i) United States Environmental Protection Agency (US EPA), December 1993, "Wildlife Exposure Factors Handbook, Volume I of II," EPA/600/R-93/187.
- (j) United States Environmental Protection Agency (US EPA), May 1992, "Supplemental Guidance to RAGS: Calculating the Concentration Term," Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-081.
- (k) United States Environmental Protection Agency (US EPA), February 1992, "Framework for Ecological Risk Assessment," EPA/630/R-92/001.
- (l) United States Environmental Protection Agency (US EPA), December 1993, "Wildlife Exposure Factors Handbook, Appendix: Literature Review Database, Volume II of II" EPA/600/ R-93/187.
- (m) United States Environmental Protection Agency (US EPA), May 1996, "Soil Screening Guidance Technical Background Document," EPA/540/R95/128.
- (n) United States Environmental Protection Agency (US EPA), June 1997, "Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments," Interim Final, EPA 540-R.97-006, OSWER 9285.7-25, PB97-963211.
- (o) United States Environmental Protection Agency (US EPA), April 1998, "Guidelines for Ecological Risk Assessment."
- (p) United States Environmental Protection Agency (US EPA), August 2000, "Supplementary Guidance for Conducting Health Risk Assessment of Chemical Mixtures," EPA/630/R-00/002, August Risk Assessment Forum Technical Panel.
- (q) United States Environmental Protection Agency (US EPA), December 2001, "Risk Assessment Guidance for Superfund: Volume 1 Human Health Evaluation Manual (Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments)," Final, OSWER 9285.7-47.
- (r) United States Environmental Protection Agency (US EPA), March 2001, "EPA Requirements for Quality Management Plans," EPA QA/R-2, EPA/240/B-01/002.
- (s) United States Environmental Protection Agency (US EPA), December 2001, "Risk Assessment Guidance for Superfund: Volume III - Part A, Process for Conducting Probabilistic Risk Assessment," EPA 540-0R-02-002 OSWER 9285.7-45 PB 2002 963302.
- (t) United States Environmental Protection Agency (US EPA), December 2002, "Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites," OSWER 9355.4-24.
- (u) United States Environmental Protection Agency (US EPA), December 2002, "Guidance for Quality Assurance Project Plans," EPA QA/G-5, EPA/240/R-02/009, OSWER 2002.
- (v) United States Environmental Protection Agency (US EPA), December 2002(a), "Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites."
- (w) United States Environmental Protection Agency (US EPA), February 2005, "Guidance for Developing Ecological Soil Screening Levels," Office of Solid Waste and Emergency Response OSWER Directive 9285.7-55.
- (x) United States Environmental Protection Agency (US EPA), December 2003, "Human Health Toxicity Values in Superfund Risk Assessment," Office of Solid Waste and Emergency Response, OSWER Directive 9285.7-53.
- (y) United States Environmental Protection Agency (US EPA), February 2004, "User's Guide for Evaluating Subsurface Vapor Intrusion into Buildings."
- (z) United States Environmental Protection Agency (US EPA), July 2004, "Risk Assessment Guidance for Superfund Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)," EPA/540/R/99/005, Final.
- (aa) United States Environmental Protection Agency (US EPA), March 2005(b), "Guidelines for Carcinogen Risk Assessment," EPA/630/P-03/001F.
- (bb) United States Environmental Protection Agency (US EPA), March 2005(c), "Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens," EPA/630/R-03/003F.
- (cc) United States Environmental Protection Agency (US EPA), February 2006, "Guidance on Systematic Planning Using the Data Quality Objectives Process," EPA/240/B-06/001.
- (dd) United States Environmental Protection Agency (US EPA), January 2009, "Risk Assessment Guidance for Superfund Volume 1: Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment)," EPA/540/R/070/002, OSWER 9285.7-82.
- (ee) United States Environmental Protection Agency (US EPA), March 2009, "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance," Final, EPA 530/R-09-007.

(ff) United States Environmental Protection Agency (US EPA), December 1991, "Risk Assessment Guidance for Super Fund Volume 1: Human Health Evaluation Manual (Part C, Risk Evaluation of Remedial Alternatives)," Office of Emergency and Remedial Response EPA/540/R-92/004, Interim.

(gg) United States Environmental Protection Agency (US EPA), September 2011, "Exposure Factors Handbook: 2011 Edition," Office of Research and Development, EPA/600/R-090/052F.

(hh) United States Environmental Protection Agency (US EPA), February 2012, "Superfund Vapor Intrusion FAQs."

(ii) United States Environmental Protection Agency (US EPA), October 2015, "ProUCL Version 5.1 Technical Guide Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations," EPA/600/R-07/041.

(jj) United States Environmental Protection Agency (US EPA), February 2014, "Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors," OSWER Directive 9200.1-20.

(kk) United States Environmental Protection Agency (US EPA), May 2014, "Vapor Intrusion Screening Level (VISL) Calculator User's Guide."

(ll) United States Environmental Protection Agency (US EPA), June 2015, "OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air," OSWER 9200.2-154.

(mm) United States Environmental Protection Agency (US EPA), June 2015, "Technical Guide for Addressing Petroleum Vapor Intrusion at Leaking Underground Storage Tank Sites."

(nn) United States Environmental Protection Agency (US EPA), March 2005, "Update of Ecological Soil Screening Level (Eco-SSL) Guidance and Contaminant Specific Documents."

(oo) United States Environmental Protection Agency (US EPA), September 1986, "Guidelines for Mutagenicity Risk Assessment", EPA/630/R-98/003.

(pp) United States Environmental Protection Agency (US EPA), September 1995, "Establishing Background Levels," OSWER Directive 9285.7-19FS, EPA/540/F-94/030.

### **R315-101-13. Definitions.**

Terms used in Rule R315-101 regarding cleanup action and Risk-Based Closure Standards are defined as follows:

(a) "95% Upper Confidence Limit or 95% UCL" means an estimate of the arithmetic average concentration for a contaminant and it provides reasonable confidence that the true site average will not be underestimated.

(b) "95% Upper Tolerance Limit or 95% UTL" means a value not to be exceeded of possible background concentration values and so provides a reasonable upper limit on what is likely to be observed in the background with 95% confidence.

(c) "Acceptable Risk Range" means cancer risk greater than or equal to  $1 \times 10^{-6}$  but less than or equal to  $1 \times 10^{-4}$  or a hazard index less than or equal to one with justifiable, reasonable and practicable measures in place to reduce and control risk within the range.

(d) "Action Level" means the existence of a contaminant concentration in the environment that is high enough to warrant an action or trigger a response action under the National Oil and Hazardous Substances Contingency Plan.

(e) "Adverse Effect" means any effect that causes harm to the normal functioning of plants, animals, or humans due to exposure to any contaminants of concern.

(f) "Appropriate Site Management Activities" means measures that are reasonable and practical that will be taken to control and reduce risks greater than  $1 \times 10^{-6}$  and less than  $1 \times 10^{-4}$  for carcinogen and hazard index equal to or less than one for non-carcinogens under both current and reasonably anticipated future land use conditions, for example, institutional controls, engineering controls, groundwater monitoring, post-closure care, or corrective action and ensuring that assumptions made in the estimation of cancer risk and non-cancer hazard in the risk assessment report are not violated.

(g) "Area of Contamination" means a hazardous waste management unit or a solid waste management unit or an area where a release has occurred.

(h) "Assessment Endpoints" means an explicit expression of environmental value that is to be protected. It is the part of the ecosystem that should be protected at a superfund site and it is generally some characteristic of a species of plant or animal, for example, reproduction, growth, that may be described numerically.

(i) "Background" means substances or locations that are not influenced by releases from a site and are naturally occurring in the environment in forms that have not been influenced by human activity or are natural and human-made substances present in the environment as a result of anthropogenic activities and not related to the site.

(j) "The boundary" means the furthest extent where contamination from a defined source has migrated in any medium when the release is first identified.

(k) "Cancer Risk" means the probability that an individual with contract cancer after lifetime exposure to a carcinogen.

(l) "Cleanup" means the range of corrective action activities that occur in the context of addressing environmental contamination at RCRA sites to lower contaminant concentration or decrease chemical toxicity. Activities may include waste removal, contaminated media removal or source reduction, such as excavation or pumping, in-place treatment of waste or contaminated media, such as bioremediation, monitored natural attenuation, containment of waste or contaminated media, such as barrier walls, low permeability covers, liners or capping, or various combination of these approaches.

(m) "Concentration Term - 95% Upper Confidence Limit" means the intake variable and it is an estimate of the arithmetic average concentration for a contaminant based on a set of site sampling results. Because of the uncertainty associated with estimating the true average concentration at a site, the 95% Upper Confidence Limit of the arithmetic mean is used to represent this variable and provides reasonable confidence that the true site average will not be underestimated.

(n) "Complete Exposure Pathway" means how a contaminant may be traced or expected to travel from a source to a plant or animal that may be affected by that chemical and shall meet the following:

NOTICES OF PROPOSED RULES

- (1) the presence of a source and transport;
- (2) exposure point or contact (receptor); and
- (3) exposure route. Otherwise exposure is incomplete.
- (o) "Conceptual Site Model" means a written, illustrative, or both, representation of a site that documents the physical, chemical and biological processes that control the transport, migration, actual or potential, or both impacts of contamination in soil, air, ground water, surface water, sediments, to human or ecological receptors, or both, exposure pathways, at a site or at a reasonably anticipated site under both current and potential future land use scenarios.
- (p) "Contaminate" means to make a medium polluted through the introduction of hazardous waste or hazardous constituents as identified in Section R315-261-1092, which incorporates by reference 40 CFR 261, Appendix VIII.
- (q) "Contaminants of Concern" means Constituents of Potential Concern that significantly contribute to a pathway in a land use scenario for a receptor that either exceeds a cumulative cancer risk of  $1 \times 10^{-4}$  or exceeds a non-cancer hazard index of one.
- (r) "Contaminants of Interest" means chemicals detected at the site during the site characterization process that may pose threat to human health or the environment.
- (s) "Constituents of Potential Concern" means constituents detected in a medium that are selected to be addressed in the risk assessment process because contact with humans may result in adverse effects.
- (t) "Constituents of Potential Ecological Concern" means any constituent that is shown to pose possible ecological risk at a site. It is generally a constituent that may or may not be causing risk or adverse effects to plants and animals at a site.
- (u) "Corrective Action" means the cleaning up of environmental problems caused by the mismanagement of wastes, or the cleanup process or program under RCRA and any activities related to the investigation, characterization, and cleanup of release of hazardous waste or hazardous constituents from solid waste management units or hazardous waste management units at a permitted or interim status treatment storage or disposal facilities or voluntary cleanup sites or brownfield sites.
- (v) "Corrective Action Complete With Controls" means a condition of a solid waste management unit, a hazardous waste management unit, an area of contamination or a contaminated site where site characterization or risk assessment indicate corrective action is required and completed and the results of the risk assessment meet the closure standards and requirements specified in Subsection R315-101-7(b), or a condition of a solid waste management unit, a hazardous waste management unit, area of contamination or a contaminated site where site characterization or risk assessment indicate corrective action is not required but also meets the closure standards and requirements specified in Subsection R315-101-7(b).
- (w) "Corrective Action Complete Without Controls" means a condition of a solid waste management unit, a hazardous waste management unit, area of contamination or a contaminated site where site characterization or risk assessment indicate corrective action is required and completed and the results of the risk assessment meet the closure standards and requirements equivalent to a no further action or meeting the requirements of Subsection R315-101-7(a) or a condition of a solid waste management unit, a hazardous waste management unit, area of contamination or a contaminated site when site characterization or risk assessment indicate corrective action is not required but also meets the closure standards and requirements equivalent to a no further action or meeting the requirements of Subsection R315-101-7(a).
- (x) "Corrective Action Level" means the concentration of a contaminant in a medium after cleanup of a site that is protective of human health and the environment.
- (y) "Data Quality Objectives" means qualitative and quantitative statements of the quality of data needed to support specific decisions or regulatory actions.
- (z) "Dilution Attenuation Factor" means the ratio of the contaminant concentration in soil leachate to the concentration in groundwater at the receptor point.
- (aa) "Environment" means the surroundings or conditions in which a person, animal, or plant lives or operates.
- (bb) "Exposure" means contact of an organism with a chemical or physical agent and it is the amount of the agent available at the exchange boundaries of the organism.
- (cc) "Exposure Pathway" means the course a chemical or physical agent takes from a source to an exposed organism.
- (dd) "Exposure Point Concentration" means either a statistical derivation of measured data or modeled data that represents an estimate of the chemical concentration available from a particular medium or route of exposure. The exposure point concentration value is used to quantify potential cancer risks and non-cancer hazards.
- (ee) "Groundwater Cleanup Levels" means site-specific groundwater chemical concentration levels based on groundwater use designation and exposure pathway established to ensure the protection of human health and the environment when defining groundwater cleanup objectives.
- (ff) "Groundwater Use" means the current or reasonably expected maximum beneficial use of groundwater that warrants the most stringent cleanup levels, including drinking or other uses.
- (gg) "Hazard Index" means the sum of hazard quotients.
- (hh) "Hazard Quotient" means the ratio of exposed dose to some reference dose or reference concentration.
- (ii) "Lowest Observed Adverse Effects Level or Lowest Observed Adverse Effects Concentration" means the lowest level of a chemical stressor evaluated in a toxicity test that shows harmful effects on a plant or animal. A Lowest Observed Adverse Effects Level is based on dose of a chemical ingested while Lowest Observed Adverse Effects Concentration refers to direct exposure to a chemical such as through the skin.
- (jj) "Maximum Contaminant Level" means the highest level of a contaminant that is allowed in drinking water and is set as close to the "Maximum Contaminant Level Goal" as feasible using the best available treatment technology and taking cost into consideration. Maximum Contaminant Levels are enforceable standards.
- (kk) "Maximum Contaminant Level Goal" means the level of a contaminant in drinking water below which there is no known or expected risk to health. Maximum Contaminant Level Goals allow for a margin of safety and are non-enforceable public health goals.

(ll) "Measures of Effects" means quantitative measurements of effects expressed as statistical or numerical assessment endpoint summaries of the observations that make up the measurement.

(mm) "Measurement End Point" means a measurable ecological characteristic that is related to the valued characteristic chosen as the assessment endpoint and it is a measure of biological effects such as death, reproduction, or growth, of a particular species.

(nn) "Natural Resources" means land, fish, wildlife, biota, air, water, ground water, drinking water supplies, and other similar resources.

(oo) "No Further Action" means the state of a solid waste management unit, a hazardous waste management unit, or a contaminated site at closure meeting the requirements in Subsection R315-101-7(a) and it is equivalent to corrective action complete without controls if the site was under corrective action activities. No further action is equivalent to unrestricted land use.

(pp) "No Observed Adverse Effects Level or No Observed Adverse Effects Concentration" means the highest level of a chemical stressor in a toxicity test that did not cause a harmful effect in a plant or animal. A No Observed Adverse Effects Level refers to a dose of chemical that is ingested, while a No Observed Adverse Effects Concentration refers to direct exposure to a chemical such as through the skin.

(qq) "Point of Departure" means the target risk level that risk to an individual is considered insignificant.

(rr) "Potentially Complete Exposure Pathway" means a pathway that, due to current site conditions is incomplete, but could become complete at a future time because of changing site practices. For example, the ingestion pathway of groundwater from a residential well in a high total dissolved solids aquifer. This pathway could be complete if treatment technologies like reverse osmosis become economically feasible and are observed to be employed successfully in that aquifer.

(ss) "Reasonable Maximum Exposure" means the highest exposure that is reasonably expected to occur at a site. Reasonable Maximum Exposure combines upper-bound and mid-range exposure factors so that the result represents an exposure scenario that is both protective and reasonable; not the worst possible case.

(tt) "Regional Screening Levels" means risk-based chemical concentrations derived from standardized equations combining exposure assumptions with US EPA chemical-specific toxicity values and target risk levels that are used for site screening and initial cleanup goals.

(uu) "Release" means spill or discharge of hazardous waste, hazardous constituents, or material that becomes hazardous waste when released to the environment.

(vv) "Responsible Party" means the owner or operator of a site, or any other person responsible for the release of hazardous waste or hazardous constituents.

(ww) "Risk-Based Clean Closure" means closure of a site where hazardous waste was managed or any medium that has been contaminated by a release of hazardous waste or hazardous constituents, and where hazardous waste or hazardous constituents remain at the site in any medium at concentrations determined, in Rule R315-101, to cause minimal levels of risk to human health and the environment so as to require no further action or monitoring by the responsible party nor any notice of hazardous waste management on the record of title to the property.

(xx) "Risk-Based Concentration" means the concentration of a contaminant the values of which are derived from equations combining toxicity factors with standard exposure scenarios to calculate chemical concentrations corresponding to some fixed levels of risks in any medium, such as water, air, fish tissue, sediment, and soil.

(yy) "Robust Statistic" means a statistic that is resistant to errors in the results, produced by deviations from assumptions, such as, normality. This means that the limits are not susceptible to outliers, or distributional assumptions. For example, if the limits are centered on the median, instead of on the mean, or on a modified, "robust mean," and constructed with suitable weighting, or influence, or function, they could be considered "robust."

(zz) "Site" means the area of contamination and any other area that could be impacted by the released contaminants, or could influence the migration of those contaminants, regardless of whether the site is owned by the responsible party.

(aaa) "Site Specific Screening Value" means contaminant screening values derived for media, such as soil, sediment, water, at a site based on relevant site assumptions and factors.

(bbb) "Source Control" means a range of actions, for example, removal, treatment in place, and containment, designed to protect human health and the environment by eliminating or minimizing migration of or exposure to significant contamination.

(ccc) "Target Risk" means any acceptable specified risk level. The preferred target risk is  $1 \times 10^{-6}$  which is at the protective end of the acceptable risk range for screening of contaminants in risk assessment and considered to be the point of departure.

**KEY: hazardous waste**

**Date of Last Change: 2026[March 15, 2023]**

**Notice of Continuation: December 11, 2025**

**Authorizing, and Implemented or Interpreted Law: 19-6-105; 19-6-106**

NOTICE OF SUBSTANTIVE CHANGE		
TYPE OF FILING: New		
Rule or section number:	R765-608a	Filing ID: 57790

**Agency Information**

1. Title catchline:	Higher Education (Utah Board of), Administration
Building:	Utah Board of Higher Education Building, The Gateway

**UTAH WASTE MANAGEMENT AND RADIATION CONTROL BOARD**

**Executive Summary**

**REQUEST FOR A SITE-SPECIFIC TREATMENT VARIANCE**

**EnergySolutions, LLC**

April 9, 2026

<p><b>What is the issue before the Board?</b></p>	<p>On March 11, 2026, EnergySolutions, LLC submitted a request (DSHW-2026-001369) to the Director of the Division of Waste Management and Radiation Control for a one-time site-specific treatment variance from the Utah Hazardous Waste Management Rules. EnergySolutions, LLC seeks authorization to receive a variance from Utah Administrative Codes R315-268-40 and R315-268-45 for the direct macroencapsulation treatment of approximately 1200 lbs. of lithium and lithium-ion batteries.</p>
<p><b>What is the historical background or context for this issue?</b></p>	<p>Lithium and lithium-ion batteries typically exhibit the hazardous characteristics of ignitability (D001) and reactivity (D003). Regulations in Utah Admin. Code R315-268-40 (40 CFR 268.40, 2015 Edition, incorporated by reference) require that these characteristic hazards be deactivated to remove the characteristic prior to land disposal. As an alternative, Utah Admin. Code R315-268-45 allows hazardous debris to be treated using immobilization technologies (e.g., macroencapsulation). However, the U.S. Environmental Protection Agency (U.S. EPA) has ruled that intact batteries are containers and not considered debris. Furthermore, the definition of macroencapsulation in Utah Admin. Code R315-268-42 states that “Macroencapsulation specifically does not include any material that would be classified as a tank or container.”</p> <p>For EnergySolutions, LLC to meet the regulatory standards described above, lithium and lithium-ion batteries would need to be shredded and mixed with chemicals to deactivate them; or punctured (and then considered debris) to macroencapsulate them. Both activities (shredding and puncturing) severely agitate the waste and would expose the reactive portion of the waste to open air which could cause an adverse reaction or explosion. Although this type of waste management is possible, from a safety and health standpoint, it is inappropriate.</p> <p>EnergySolutions, LLC proposes to manage this waste by directly macroencapsulating the intact batteries. Macroencapsulation is a permitted treatment technology that isolates hazardous waste from the environment, eliminating the potential for harmful reactions from exposure to the environment. Macroencapsulation requires less handling of the waste and creates a waste form for disposal that is protective of human health and the environment.</p> <p>Final disposal of the lithium and lithium-ion batteries will occur in the Mixed Waste Disposal Cell at the EnergySolutions, LLC Mixed Waste Facility using the appropriate attachments of modules of the state-issued Part B permit.</p>

	<p>A notice for public comment was published in the <i>Deseret News</i> on April 3, 2026, the <i>Salt Lake Tribune</i> and the <i>Tooele Transcript Bulletin</i> on April 8, 2026. The comment period began April 9, 2026 and will end May 11, 2026.</p> <p>EnergySolutions, LLC requested this same variance five times previously in letters dated March 17, 2021 (CD-2021-039), March 22, 2022 (CD-2022-062), April 11, 2023 (CD-2023-081), April 16, 2024 (CD-2024-085) and April 15, 2025 (CD-2025-075).</p> <p>These requests were approved on May 13, 2021 (DSHW-2021-007602), June 9, 2022 (DSHW-2022-015603), June 8, 2023 (DSHW-2023-205003), June 13, 2024 (DSHW-2024-006740) and June 12, 2025 (DSHW-2025-002871).</p> <p>EnergySolutions, LLC has received approximately 900 lbs. of this waste since the variance was approved in 2025.</p>
<p><b>What is the governing statutory or regulatory citation?</b></p>	<p>Variances are provided for in 19-6-111 of the Utah Solid and Hazardous Waste Act. This is a one-time site-specific variance from an applicable treatment standard as allowed by Utah Admin. Code R315-268-44.</p>
<p><b>Is Board action required?</b></p>	<p>No. This is an informational item before the Board.</p>
<p><b>What is the Division/Director's recommendation?</b></p>	<p>The Director will provide a recommendation following the public comment period at the next Board meeting.</p>
<p><b>Where can more information be obtained?</b></p>	<p>For technical questions, please contact Tyler Hegburg (385) 622-1875. For legal questions, please contact Bret Randall at (801) 536-0284.</p>

DSHW-2026-001375  
Attachment: DSHW-2026-001369

March 11, 2026

CD-2026-048

Mr. Ted Sonnenburg  
Director  
Division of Waste Management and Radiation Control  
195 North 1950 West  
Salt Lake City, UT 84114-4880

Subject: EPA ID Number UTD982598898  
Request for a Site-Specific Treatment Variance for the Macroencapsulation of  
Lithium and Lithium-Ion Batteries

Dear Mr. Sonnenburg:

EnergySolutions herein requests an exemption from Utah Administrative Code (UAC) R315-268-40 and R315-268-45 for the direct macroencapsulation treatment of lithium and lithium-ion batteries. This request is being submitted in accordance with the requirements of UAC R315-260-19.

The regulatory requirement authorizing this request is found in UAC R315-268-44 which allows a site-specific variance from an applicable treatment standard provided that the following condition is met:

*UAC R315-268-44(h)(2) It is inappropriate to require the waste to be treated to the level specified in the treatment standard or by the method specified as the treatment standard, even though such treatment is technically possible.*

Lithium and lithium-ion batteries typically exhibit the hazardous characteristics of ignitability (D001) and reactivity (D003). Regulations in UAC R315-268-40 (40 CFR 268.40, 2015 Edition, incorporated by reference) require that these characteristic hazards be deactivated to remove the characteristic prior to land disposal. As an alternative, UAC R315-268-45 allows hazardous debris to be treated using an immobilization technology (e.g., macroencapsulation). However, the Environmental Protection Agency (EPA) has ruled that intact batteries are containers and not considered debris (see attached letter dated November 10, 1993). Furthermore, the definition of macroencapsulation in R315-268-42 states that “[M]acroencapsulation specifically does not include any material that would be classified as a tank or container.”



Mr. Ted Sonnenburg  
March 11, 2026  
CD-2026-048  
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In order to meet the regulatory standards described above, lithium and lithium-ion batteries would need to be shredded and mixed with chemicals to deactivate them; or punctured (and then considered debris) to macroencapsulate them. Both of these activities (shredding and puncturing) severely agitate the waste and would expose the reactive portion of the waste to open air which could cause an adverse reaction or explosion. Although this type of waste management is possible, from a safety and health standpoint, it is inappropriate.

EnergySolutions proposes to manage this waste by directly macroencapsulating the intact batteries. Macroencapsulation is a permitted treatment technology that isolates hazardous waste from the environment, eliminating the potential for harmful reactions from exposure to the environment. Macroencapsulation requires less handling of the waste and creates a waste form for disposal that is protective of human health and the environment.

EnergySolutions requested this same variance 5 times previously in letters dated March 17, 2021 (CD-2021-039), March 22, 2022 (CD-2022-062), April 11, 2023 (CD-2023-081), April 16, 2024 (CD-2024-085) and April 15, 2025 (CD-2025-075). These requests were approved on May 13, 2021 (DSHW-2021-007602), June 9, 2022 (DSHW-2022-015603), June 8, 2023 (DSHW-2023-205003), June 13, 2024 (DSHW-2024-006740) and June 12, 2025 (DSHW-2025-002871). EnergySolutions has received approximately 900 lbs. of this waste since the variance was approved in 2025. This variance request is for the ongoing processing and disposal of additional lithium and lithium-ion batteries.

EnergySolutions requests that a variance be granted to allow the receipt, macroencapsulation treatment and disposal of approximately 1200 lbs. of lithium and lithium-ion batteries.

The name, phone number, and address of the person who should be contacted to notify EnergySolutions of decisions by the Director is

Mr. Vern Rogers  
Director of Regulatory Affairs  
EnergySolutions LLC  
299 South Main Street, Suite 1700  
Salt Lake City, UT 84111  
(801) 649-2000

Should there be any questions to this request, please contact me at (801) 649-2043.

Sincerely,



Mr. Ted Sonnenburg  
March 11, 2026  
CD-2026-048  
Page 3 of 3

Steve D. Gurr  
Environmental Engineer and Manager

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

9441.1993(23)

## REGULATORY STATUS OF BATTERY CARCASSES

United States Environmental Protection Agency  
Washington, D.C. 20460  
Office of Solid Waste and Emergency Response

November 10, 1993

Mr. Christopher L. Freed  
Chemical Waste Management, Inc.  
Manager - Environmental Regulations  
3001 Butterfield Road  
Oak Brook, Illinois 60521

Dear Mr. Freed:

Thank you for your letter of April 30, 1993 summarizing your meeting of April 29, 1993 with Richard Kinch of my staff. Upon further investigation of this issue since the receipt of your letter, however, it is clear that battery carcasses do not qualify as debris. They are considered to be containers, as explained below.

As discussed in detail in the preamble to the final rule establishing alternate treatment standards for hazardous debris, intact containers are not debris, and hence are not subject to the treatment standards for debris. 57 FR 37225 (August 18, 1992). In addition, in previous rulemakings EPA has stated that battery casings designed to hold free liquids for use other than storage are containers. I refer you specifically to 40 CFR 264.314(d)(3); 265.314(c)(3); and 55 FR 22637/2 (June 1, 1990). Thus, such intact battery casings are not debris.

In your letter, you state that EPA suggested, elsewhere in the preamble to the final debris rule, that batteries could be debris unless they are subject to a specific treatment standard. I believe you have based this statement on the discussion at 57 FR 37222 and footnote 10, which gives "lead acid or cadmium batteries" as an example of a debris subject to a specific treatment standard. Unfortunately, you then draw the inference that because mercury batteries are not mentioned in this footnote, they are therefore debris.

This is an incorrect conclusion. First, please note that the actual regulatory language does not contain the example of the lead acid battery. 57 FR at 37270. More important, as explained above, intact containers are never classified as debris. Consequently, the example in footnote 10 refers only to lead acid or cadmium batteries that are not intact. Such batteries would still not be subject to the treatment standards for debris because there is a more specific treatment standard for lead acid or cadmium batteries. The footnote does not, however, in any way vitiate the general principle that intact containers are not debris and that batteries are types of containers.

I hope this response, based on a thorough examination of the issue of concern, is helpful. If you need further information, please contact Richard Kinch, Chief of the Waste Treatment Branch in our Waste Management Division at (703) 308-8434.

Sincerely,  
Bruce R. Weddle  
Acting Director  
Office of Solid Waste