Environmental Defense Institute

Troy, Idaho 83871-0220

http://www.environmental-defense-institute.org

July 8, 2019 [Rev.2.0]

Brian English
(sent via email via brian.english@deq.idaho.gov
Hazardous Waste Permit Coordinator
Idaho Department of Environmental Quality
1410 North Hilton Boise, ID 83706-1255

Greetings:

RE: DRAFT CLASS 3 PERMIT MODIFICATION for the Liquid Waste Management System at the Idaho Nuclear Technology and Engineering Center at the Idaho National Laboratory EPA ID NO. ID4890008952

Abstract

These comments for the public record are submitted by Chuck Broscious on behalf of the Environmental Defense Institute (EDI) Inc.. EDI has submitted comments >7 times on this permit and are included by citation. [1] EDI reserves the right to submit supplemental comments due to limited time (60 days) allowed for comments. IDEQ states: "This public participation process for a Class 3 Permit Modification is consistent with the process for a new permit application except **that only the draft modifications to the permit are open for comment**. Comments on previously issues portions of the permit, by regulation will not be considered." [2] [emphasis in the original] IDEQ fails to cite the regulation that restricts public comment on any part of the approved permit. This arbitrary policy deliberately excludes members of the public who may have only recently become aware of the IWTU permit process from commenting on the whole permit. Due to huge amount of information in the Permit, even EDI has come across information we missed in previous comment periods and are now blocked from commenting on previously approved portions. IDEQ allows access to "documents retained by DEQ in support of the draft modifications **except for federal documents that are labeled 'Official Use Only' (OUO). The modification request contains federal OUO documents."** [3] [emphasis added]

---

[1] EDI Integrated Waste Treatment Unit (IWTU) Permit Comments, by Chuck Broscious, May 2, 2019 and Attachment A and B.
http://www.environmental-defense-institute.org/publications/EDIcommentIWTU519.pdf
EDI IWTU Permit Comments September 2014
http://www.environmental-defense-institute.org/publications/EDI%20Permit.Com.IWMS.pdf
EDI IWTU Permit Comments August 2013
http://www.environmental-defense-institute.org/publications/EDI%20Permit.Mod.Com.IWTU.pdf
EDI IWTU Permit Comments 3/13/12 [Rev.3]
http://www.environmental-defense-institute.org/publications/EDI%20Com.%20Final-RH-LLW-INL.-final.3.w-Pics.pdf
EDI IWTU Permit Comments May1, 2012
http://www.environmental-defense-institute.org/publications/EDI-Tank-Closure-IWTU-Com.-Fin.5.12.pdf
EDI and Keep Yellowstone Nuclear Free IWTU Comments February 28, 2007
http://www.environmental-defense-institute.org/publications/EDI%20Permit.Com.IWTU.Final..2.28.07.Rev.2.pdf
EDI IWTU Permit Comments November 3, 2006
http://www.environmental-defense-institute.org/publications/EDI%20Com.IWTU.fin.11.3.06.pdf

[2] IDEQ Dear Concerned Citizen Fact sheet, 5/24/19.

[3] Ibid. This OUO exclusion begs the question as to what DOE is hiding about this high-level waste treatment process that would mandate such a radical exclusion of document access "to protect company confidential information." This alone must ring alarm bells among the public.

IDEQ offers no meaningful explanation – legal or otherwise for this arbitrary secrecy of government contractor work-product paid for by the tax payer - treatment technology by Flore Idaho that has no legitimacy being confidential, proprietarily or OUO. [4] IDEQ also claims in its Dear Concerned Citizen Fact Sheet that: "Supplemental information was submitted with the Permit modification request is included for public comment and consists of the following:" in fact apparently is not available. [5] IDEQ apparently did not anticipate anyone checking to see if this crucial information is actually accessible to the public for review. Another problem was that the files are so large that most folks without high-speed fiber optic ISP/DSL connections cannot download the unnecessarily huge files. Since EDI generates these comments as much to inform the public as well as IDEQ, we choose to comment on the whole permit so the public can see all the issues and be better informed.

When DOE might again turn Idaho's otherwise pristine air into a radioactive dump, the public (not previously aware of the permit) must have the opportunity to comment. [6] Because you can't see it, smell it, or taste it this DOE modus operandi escapes the usual challenges of other smoke stack operations. It is also useful and intentional, that these operations are located on a highly secretive and restricted nuclear reservation the size of Rhode Island in the southeastern Idaho desert. EDI has always been a ardent proponent of treating and converting DOE's legacy ~ 850,000 gal. high-level-liquid radioactive waste into a safe disposable form for a permanent deep geologic repository. [7] The question is choosing the appropriate EPA treatment classification and technology so that the requisite emission control standards can be applied! DOE convinced EPA and Idaho Department of Environmental Quality (IDEQ) to accept a lower and less restrictive emission control system than the legal requirements stipulate. We discuss this in detail below.

Section I Summary

This Department of Energy (DOE) Idaho National Laboratory (INL) Hazardous Waste Partial Permit for the Idaho Nuclear Technology and Engineering Center (INTEC) for the Liquid Waste Management System (LWMS) and the Integrated Waste Treatment Unit (IWTU) is the most recent iteration of a desperate attempt to get an environmentally compromised plan operational. [8] This process has drug out

---

[4] DOE used a similar "national security" restriction on waste encountered at the INL Radioactive Waste Management Complex requiring that waste removal operations be suspended immediately. This continues today 70 years after this secret waste was dumped. The result is an unknown quantity of potentially deadly hazardous/radioactive material remains buried above Snake River Aquifer that continues to have contaminates migrate from buried waste. No credible "national security" interest can be legitimately applied here - other than covering up governmental accountability for illegal operations. How long can the public be expected accept this bogus policy?

[5] Listed documents not found in IDEQ's web site posting include: EDF-9937, EDF- 1102, EDF- 10407, EDF- 10739, EDF-11061, EDF-10151, and SPC-2176.

[6] DOE's previous operation of Waste Calcine Facility and New Waste Calcine Facility that incinerated the waste from reprocessing SNF that produced 7,733,000 gal. (29,280,000 L) of INL's high-level liquid radioactive waste. That is essentially an enormous amount of spent nuclear fuel minus the uranium-235 and volatiles. See: U.S. Nuclear Waste Technical Review Board, "Calcined High-Level Radioactive Waste," Factsheet. http://www.nwtrb.gov/facts/Calcined_HLW.pdf
EDI Preliminary Comments to Idaho Department of Environmental Quality on Calcined Solids Storage Facility Partial Permit Renewal by Chuck Broscious and David B. McCoy, May 2017 and click here for Photos of calcine binsets and predicted flow depths
http://www.environmental-defense-institute.org/publications/EDI-CSSF-Permit-S.pdf

[7] EDI completely supports decisions by B.Lynn Winmill, Chief Judge U.S. District Court for Idaho, July 2, 2003, Memorandum Decision in NRDC v. DOE, Civ. No. 01-0413-S-BLM, concludes DOE SBW is high-level waste under the NWPA.

[8] "This draft Modification was prepared based upon request to replace the existing ring header in the [denitration mineralization reformer] DMR with a duel plenum design, to modify the nozzles and repair the refractory in the [carbon reduction reformer] CRR, to install a modified auger/grinder and incorporate several other changes to the operation of the IWTU." IDEQ Dear Concerned Citizen Fact sheet, 5/24/19.

so long that DOE is now on its second contractor (Fluor Idaho) in the hopes they can secure a new partial permit to implement numerous fatal flaws in the design of the IWTU operating systems. [9]

This DOE partial permit request submitted to Idaho Department of Environmental Quality (IDEQ) includes significant alterations to the IWTU facility as a first step of two [10] to convert ~850,000 gal. high-level liquid radioactive and hazardous waste into a solid that will require additional processing to produce a waste material that **may** meet acceptance criterial for permanent disposal facility. DOE rejected a treatment process to combine both steps into one. The final treatment step will require an additional treatment process (converting the existing IWTU building) that will produce a vitrified glass type material that DOE hopes will meet an unknown disposal facility waste acceptance criteria. [11] Since Congress refuses to fund a permanent high-level waste deep geological facility, the IWTU waste product will likely remain at the INL indefinitely.

DOE's stalling on direct vitrification using IWTU as pre-treatment is not supported by its own analysis.

> "The ability to re-use existing facilities (i.e., IWTU) will be limited (i.e., cost-prohibitive) for more complex processing technologies (i.e., high temperature and/or high pressure) that involve several steps, especially those that require complete decontamination, dismantlement, and removal of all existing processing equipment, while retaining the structure." [12]

The INL Integrated Waste Treatment Unit (IWTU) is designed to convert ~850,000 gallons of high-level liquid waste generated over five decades of irradiated nuclear reactor fuel reprocessing together with newly generated waste to a solid form suitable for final disposal in a geologic repository. This waste is what is left-over after nuclear reactor fuel rods are dissolved with acids and solvents so that the highly enriched uranium and plutonium can be extracted for military use. It is crucial to remember that this is the most deadly material on the planet. A dixy cup of it on the table in front of you would give you a fatal dose of radiation before you could get up and leave the room.

DOE has been trying for decades to convert this high-level liquid waste into a stable form that can be put into a permanent waste repository. This more recent DOE treatment – IWTU - from construction to startup (still pending approval of this Partial Permit) has taken over 15 years at a high cost. "The fact that the official cost estimate of reforming INL's waste has ballooned by a factor of nearly four (from $121 million to $600 million) since CWI was awarded its contract…" [13] Yet DOE is eager to "include $824 million for nuclear energy research and development. The Office of Nuclear Energy (NE) is working to revitalize the nuclear energy." [14] This is a clear example of warped priorities of our tax

---

[9] EDI Integrated Waste Treatment Unit (IWTU) Permit Comments, by Chuck Broscious, May 2, 2019, see DNFSB Attachment A. http://www.environmental-defense-institute.org/publications/EDIcommentIWTU519.pdf

[10] IWTU is the first step of two to convert high-level liquid waste into a solid . The second treatment step will convert the IWTU granular waste into a vitrified type glass that may meet final depository acceptance criteria. There is no apparent explanation on the change of volume from the previous 900,000 gal.to 850,000 gal..

[11] Amended Record of Decision: Idaho High-Level Waste and Facilities Disposition Final Environmental Impact Statement Revised by State 12/21/09

[12] U.S. DOE-EM Independent Analysis of Alternatives for Disposition of the Idaho Calcined High-Level Waste Inventory Volume 1-Summary Report, Pg. 27. Hereinafter AoA

[13] *What DEQ should do about INL's $600 million "Steam Reforming" Boondoggle,* Darryl D. Siemer, PhD, Retired INL "Consulting Scientist" 15Apr2012, (updated for DNFSB 9Jul12) states: "Vitrification represents the 'best demonstrated available technology' for treating raw reprocessing waste because it is both relatively simple (and therefore cheap) to implement and naturally produces an intrinsically leach resistant (durable) product (large, steel-encased, borosilicate glass monoliths) suitable for transport and/or direct geological disposal. On the other hand, fluidized bed steam reforming is intrinsically difficult (and therefore expensive) to implement and generates a readily dispersible, water soluble, dirt-like product unsuitable for either transport or direct disposal. The fact that the official cost estimate of reforming INL's waste has ballooned by a factor of nearly four (from $121 million to $460 million) since CWI was awarded its contract is now causing massive layoffs of its employees (your neighbors & mine) not directly employed by that project. It is also serving to reduce public confidence in following."

[14] DOE-NE Notice: *5 Things to Know about the Nuclear Energy FY2020 Budget Request* April 3, 2019

dollars – funding new reactors over public health and safety when there is no path-forward for legacy high-level waste already in DOE's inventory.

Since IDEQ reportedly claims it has no control over DOE's treatment selection, the State can however control enforcement/compliance with existing EPA/RCRA rules that control environmental health and safety regulations which if properly applied could still protect the public from extremely hazardous radioactive emissions if the correct emission control standards are applied. Tragically, EPA/IDEQ fail to exercise their regulatory authority and public health and environmental protection mandate by not forcing DOE to comply with the correct treatment criteria. We discuss this more below.

It's germane to this Partial Permit to discuss DOE's characterization of the ~850,000 gal of INL Tank Farm waste as "sodium-bearing waste," or "Waste Incidental to Reprocessing" [15] and **not** high-level mixed hazardous/ radioactive waste because selling this to the public makes it more palatable. This bait and switch also makes it easier to claim a less stringent waste treatment category and less stringent emission standards.

EDI rejects the DOE's proposal to re-interpret the definition of the statutory term "high-level radioactive waste" (HLW) as set forth in the Atomic Energy Act of 1954 and the Nuclear Waste Policy Act of 1982. [16] This represents DOE's ongoing reneging on Settlement Agreements and Consent Orders to Federal Court Orders to remove all HLW and transuranic waste from Idaho.

EDI's comments submitted to DOE [17] on how DOE/INL continues to reclassify HLW as transuranic (TRU), and Greater-than-Class C low-level (GTCC) wastes. We must cover these other waste groups in order to show the impact of DOE's policy of unilaterally changing the definition of HLW is having at INL. Specifically, DOE changed the formerly ~900,000 gal. HLW sodium-bearing waste (SBW) generated from reprocessing spent nuclear fuel (SNF) to "waste incidental to reprocessing" (WIR) mixed hazardous TRU; and IWTU waste formerly HLW to GTCCW that can be dumped in INL near surface Remote-Handled Waste Disposal Facility if it cannot be shipped to WIPP. (We discuss this issue more below)

EDI's focus below is on EPA/IDEQ refusal to appropriately classify the IWTU treatment process and thus not apply the legally applicable EPA emission control standards is influenced by reclassifying the waste to a lower category.[18] Below we will again show which treatment process and emission standards legally must be applied to the IWTU. Obviously, DOE's reason for classification misapplication of IWTU to a lower waste treatment class is to avoid the more stringent MACT emission standards because they are more expensive.

In a statement by Geoff Fettus, a senior attorney at the Natural Resources Defense Council: [19]

> "The Trump administration is moving to fundamentally alter more than 50 years of national consensus on how the most toxic and radioactive waste in the world is managed and ultimately

---

[15] Notice of Preferred Sodium Bearing Waste Treatment Technology, Federal Register /Vol. 70, No. 148 /Wednesday, August 3, 2005 /Notices, DEPARTMENT OF ENERGY Office of Environmental Management.

[16] See : Comments for the Record on U.S. Department of Energy Interpretation of High-Level Radioactive Waste http://www.environmental-defense-institute.org/publications/EDIComHLW6.pdf

[17] Supplementary Public Comments for the Record on U.S. Department of Energy Interpretation of High-Level Radioactive Waste submitted on behalf of EDI 12/16/18. http://www.environmental-defense-institute.org/publications/EDIComHLW6.pdf

[18] EDI letter to EPA Office of Enforcement, 7/24/01, RE: (1) Applicability of Maximum Achievable Control Technology (MACT) standards 40 CFR 63 Subpart DD to Idaho Engineering and Environmental Laboratory) INEEL (also INEL) and the (Idaho National Technology and Engineering Center (INTEC) formerly the Idaho Chemical Processing Plant (ICPP) (2) applicability of Maximum Achievable Control Technology (MACT) to INEEL as an industrially operated Publicly Owned Treatment Works/Federally Owned Treatment Works POTW/FOTW) (40 CFR 63.1580 et seq.) and (3) as a prospective "Major Source Category" under "Site Remediation" (40 CFR 63.112).

[19] Natural Resources Defense Council, "Energy Department Moves to Abandon Radioactive Waste," June 5, 2019, cited by Tami Thatcher, EDI July 2019 Newsletter. https://www.nrdc.org/media/2019/190605-3

disposed of. No matter what they call it, this waste needs a permanent, well-protected disposal option to guard it for generations to come."

In a letter earlier this year from the Idaho Department of Environmental Quality to the U.S. Department of Energy regarding the DOE's interpretation of High-Level waste, [20] the Idaho DEQ stated numerous concerns.

"Idaho is concerned about DOE's proposal for several reasons. First, it appears that DOE has not yet complied with Section 3139 of the National Defense Authorization Act for Fiscal Year 2018 (H.R. 2810), which required DOE to prepare and submit a report to Congress, not later than February 1, 2018, on the 'Evaluation of Classification of Certain Defense Nuclear Waste.' This report is required to include multiple specific evaluations, as listed under subsection b, which directly impact several State of Idaho concerns below. In the absence of this information the State cannot fully evaluate the ramifications of this proposal. Moreover, it seems premature for DOE to move forward with this proposal when it has not met the Congressional directive." [21]

The IDEQ letter continues "Next, it should be noted this approach to reclassification of HLW under the authority of Order 435.1 has already been attempted and proven unsuccessful. See, *Natural Resources Defense Council v. Abraham*, 271 F.Supp.2d 1260 (D. Idaho 2003) *vacated on other grounds*, 388 F.3d.701 (2004). The Court in *Abraham* held that the definition of HLW was established by Congress and that DOE could not, via order, ignore the plain language of the Nuclear Waste Policy Act. Idaho, along with several other States, participated as *Amici* in that case due in part to the same concerns expressed below. Idaho encourages DOE to work with states and affected parties collaboratively to resolve these concerns."

"Similar to the past approach, the current proposal outlined in the Federal Register appears to imply unilateral authority on the part of the DOE to determine what wastes are to be considered as HLW and non-HLW, irrespective of the position held by the states which host the affected waste streams. As the Court in *Abraham* put it succinctly, 'These "alternative requirements" are not defined, and thus are subject to the whim of DOE.' 217 F.Supp.2d at 1265. The current proposal's reference to '*performance objectives of a disposal facility as demonstrated through a performance assessment conducted in accordance with applicable regulatory requirements*' is equally vague and leaves too much discretionary power to the DOE to leave waste in place. This does not align with Idaho's position with respect to the requirements for treatment and disposition of certain waste streams currently located at the Idaho National Laboratory (INL). More specifically, Idaho will point out that DOE cannot 'reclassify' wastes that are defined in the 1995 Settlement Agreement and were the subject of that Agreement. **This vagueness and the inherent risks it poses generate a significant, and unacceptable, level of uncertainty for the State." [emphasis added]**

"DOE has also not provided sufficient detailed information concerning the process by which each individual waste stream will be evaluated for categorization as HLW and non-HLW. The State of Idaho is concerned regarding the lack of objective criteria for making waste determinations and, again, is concerned that DOE will make such determinations unilaterally. Additional, documentation of technical requirements governing the conduct of performance assessments necessary to adequately characterize affected waste streams to ensure the protection of human health and the environment is also lacking at this time."

---

[20] John H. Tippets, Director, Idaho Department of Environmental Quality, Letter to Anne White, Assistant Secretary, Office of Environmental Management, U.S. Department of Energy, Subject: State of Idaho Comments on U.S. Department of Energy Interpretation of High Level Radioactive Waste (83 FR 50909), January 9, 2019. See it on our website written by Tami Thatcher at http://www.environmental-defense-institute.org/publications/IDEQHLW.pdf

[21] Cited by Tami Thatcher, EDI July 2019 Newsletter, http://www.environmental-defense-institute.org/publications/

"Based on the items identified herein, the State of Idaho is unable to fully evaluate the proposal outlined in the Federal Register." [22]

"Prior to a decision to move forward with the proposed interpretation of the existing HLW definition, the State formally requests that DOE provide the information described above, followed by collaborative dialogue to address all State of Idaho concerns." [23]

To find out more about what's at stake, read articles on the EDI website and see High Level Waste comment submittals by Tami Thatcher and by Chuck Broscious on the Environmental Defense Institute website. [24] [25]

Human health and environmental protection has never been a priority of DOE. [26] Certainly DOE will try to avoid adequate radionuclide emission monitoring, and try to base all future operations emissions on initial testing or "trial burns," which could well be of liquid in the waste tanks that is **not** representative of radionuclides in the lower stratified levels of waste tanks, despite some efforts at later mixing [27] to ensure low emissions to justify/comply with permit requirements. Thankfully, IDEQ will offer the public another opportunity to comment after the "trial burns" and evaluate the emission data. However if DOE does not use representative waste in the trial burns, the additional public comment opportunities will be meaningless. No adequate continuous radioactive monitoring is apparent in the current permit modification presumably because IDEQ claims it has no regulatory authority under IDAPA over radioactive emissions – just hazardous air pollutants (HAP). Thus, according to IDEQ only the currently compromised EPA Region 10 can exercise this control over radioactive emissions.

The high-level liquid waste (HLLW) currently in the 3 remaining INTEC Tank Farm represents the condensed waste from the 11 closed HLW tanks, sediments (heels) and thus is much more concentrated. [28] DOE tries to claim that this remaining waste is the product of second, third cycle raffinate. This is not completely accurate.

DOE's High-Level Waste Notice it states: "SBW is a liquid mixed radioactive waste (contains hazardous and radioactive constituents) produced primarily from INTEC decontamination and cleanup activities. SBW also includes approximately one percent (by volume) commingled 1st cycle reprocessing waste, approximately two percent 2nd cycle reprocessing waste, and approximately four percent 3rd cycle reprocessing waste." [29] The State of Idaho got suckered into believing DOE estimates on the % of raffinate left in the SBW and would

---

[22] Ibid.

[23] Ibid

[24] Environmental Defense Institute newsletter articles: If You Care About Human Health and the Environment, You Will Oppose Allowing DOE's HLW Reclassification, http://www.environmental-defense-institute.org/publications/News.19.Jan.pdf and Idaho Leaders and the Department of Energy Not Being Transparent About High-Level Waste Reclassification, Idaho Department of Environmental Quality Concerns About DOE's Proposed HLW Reclassification, and State of Washington Opposes DOE's Proposed HLW Reclassification, http://environmental-defense-institute.org/publications/News.19.Feb.pdf

[25] High-level Waste Reclassification comment submittals at http://www.environmental-defense-institute.org/index.html (http://www.environmental-defense-institute.org/publications/CommentDOEHLW.pdf and http://www.environmental-defense-institute.org/publications/EDIComHLW6.pdf)

[26] EDI's Notice of Intent to Sue DOE for violation of numerous environmental regulations for operation of the New Waste Calcine Facility ultimately resulted in the closure of the plant. See: Notice of Intent to Sue 4/11/2000 Over DOE's Failure to Comply with the Resource Recovery and Conservation Act, 42 U.S.C. § 6901 et seq. and the Clean Air Act in operation of the New Waste Calcining Facility at the Idaho National Engineering Laboratory.

[27] Mixing or dilution is prohibited to avoid regulatory requirements .

[28] Tank Farm volume reduction though has resulted in radiological air emissions from INTEC sources are primarily associated with liquid-waste operations, including effluents from the Tank Farm Facility, Process Equipment Waste Evaporator, and Liquid Effluent Treatment and Disposal, which are exhausted through the Main Stack.

[29] Notice of Preferred Sodium Bearing Waste Treatment Technology, Federal Register /Vol. 70, No. 148 /Wednesday, August 3, 2005 /Notices, DEPARTMENT OF ENERGY Office of Environmental Management

follow through with its promises to ship the treated SBW to Waste Isolation Pilot Plant (WIPP) in New Mexico and disregarded the Nuclear Waste Policy Act's (NWPA) definition of HLW. In keeping with the NWPA, NM Department of Environmental Quality has blocked bringing waste derived from reprocessing SNF (like calcine/SBW/IWTU product) to WIPP. Again Federal District Court Judge Winmill states:

> "In this case, Congress defined HLW in NWPA as 'highly radioactive material resulting from the reprocessing of spent nuclear fuel.' Congress then used the word 'including' to signal that what followed were examples designed to illustrate the definition just given. The two examples designated to illustrate the definition just given. The two examples are (1) 'liquid waste produced directly in reprocessing'; and (2) 'solid material derived from such liquid waste that contains fission products in sufficient concentrations.'"
>
> "These two examples neatly cover the manner in which the waste separates in the tanks over time. As discussed above, the solids sink to the bottom, forming a sludge, leaving the liquids on top. This physical separations is analogous to the NWPA's definitional separation: The liquid and solids are treated differently by the Act. While NWPA allows DOE to treat the solids to remove fission product, thereby permitting reclassification of the waste, NWPA does not offer the option of reclassification for liquid waste produced directly in reprocessing." [Pg.10]
>
> "NWPA's definition of HLW considers the source of the waste and, in the case of solids derived from liquid waste, its hazard. It is undisputed that the waste stored at Hanford, INEEL, and Savannah River is highly radioactive and the result of reprocessing. No solids are yet been extracted from the liquid waste at those sites and treated to reduce fission products. Thus, the waste at issue in this case falls within NWPA's definition of HLW." [30] [Pg.11]

Evaluating the SBW Tanks we must keep in mind that they were previously used for 1st cycle raffinate from reprocessing Spent Nuclear Fuel (SNF) and when converted to SBW Tanks considerable 1st cycle waste remained in the tank sediments/heels:

> "By February 1998, the liquid first-cycle extraction waste was removed from the TFF. Only small (1,000–15,000 gal) heels in eight of the eleven 300,000-gal storage tanks remained, which could not be removed with existing equipment. Reuse of the first-cycle waste storage tanks to store SBW has resulted in the mingling of the first-cycle waste heels with SBW." [31] [Pg.17][emphasis added]

Natural Resources Defense Council et al. will file a new complaint in Federal District Court to restart the litigation in the Ninth Circuit Court of Appeals ruling that the DOE action on HLW was not "ripe" for a ruling. Judge B. Lynn Minmill, Chief Judge, US District Court, August 9, 2002 states:

> "This case was transferred to this Court by the Ninth Circuit. *See NRDC v. Abraham, 244 F.3d 742 (9th Cir. 2001)*. In its opinion, the Circuit found that it lacked original or exclusive jurisdiction under 42 U.S.C. ss 10139 to entertain Plaintiffs' claims because the decision by the DOE in promulgating Order 435.1 was not made pursuant to the Nuclear Waste Policy Act 42 U.S.C. ss 10101 et seq. See is.at 747. However the Ninth Circuit expressly noted that issues relating to standing, ripeness, and the merits of the Plaintiff's claims must be decided by this Court. *See id.*" Foot note 5 [pg2]
>
> "Moreover, delaying review of Order 435.1 until the DOE makes a site specific decision conformance with the Order may cause substantial harm. Tank closures, once undertaken, aren't readily altered and future judicial review may therefore be foreclosed until it is too late."
>
> " Foot note 5 "The Court notes that council for Plaintiffs suggested during oral arguments that the closure of two tanks at SRS occurred under circumstances in which they were unable to bring a timely action to obtain judicial review of that decision." [pg.7]
>
> "The Court need not wait until a threatening injury comes to fruition before undertaking judicial review. This is particularly true where the DOE Order has the force of law and requires immediate compliance by DOE facilities as well as DOE contractors. In such a case, a justiciable controversy exists that is ripe for review, because the Court can 'firmly predict' the result that would occur through the application of Order 435.1. ('One does not have to await the consummation of threatened injury to obtain preventive relief. If the injury s certainly impending, that is enough.')" [pg.8]

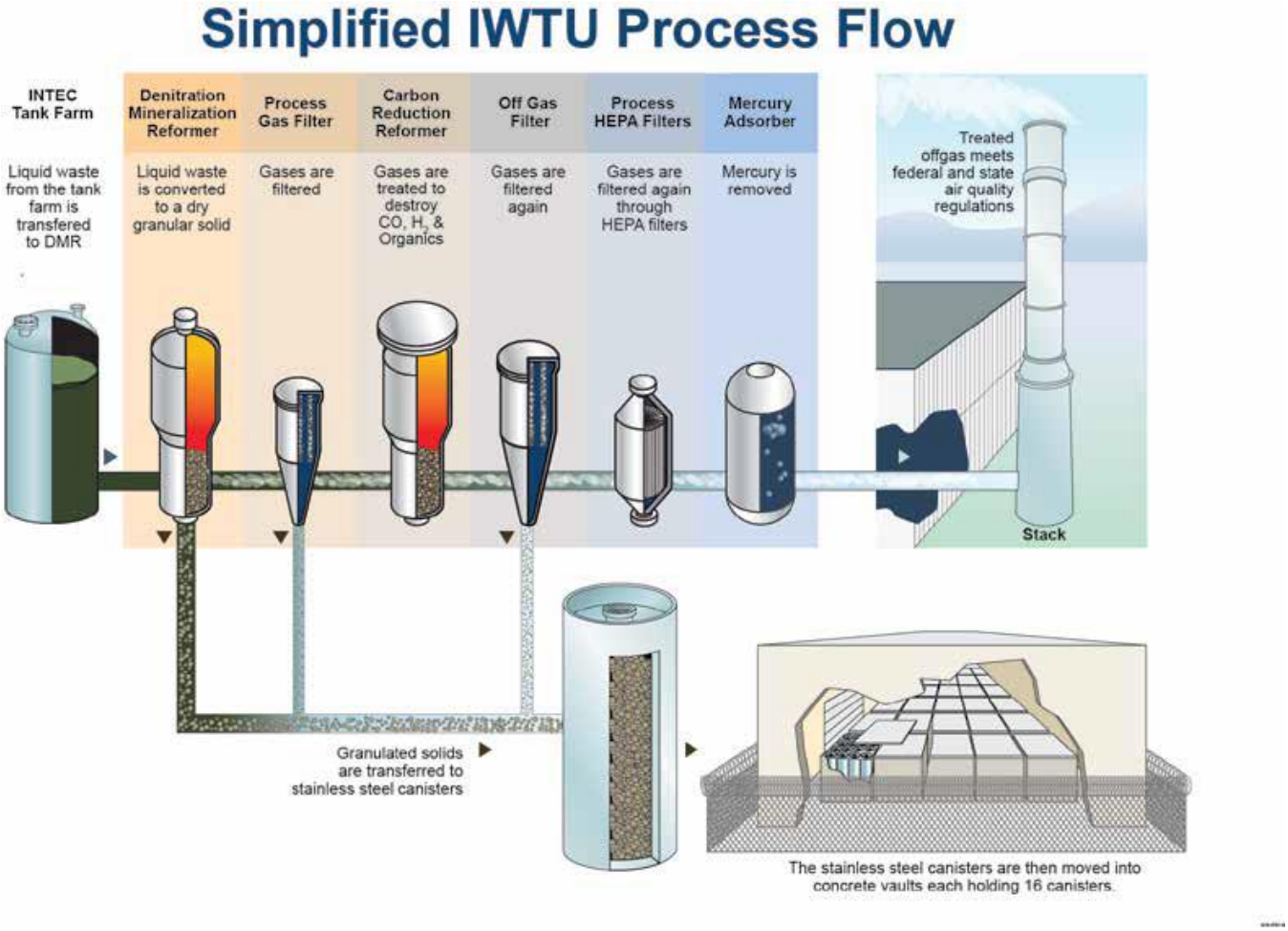
---

[30] B.Lynn Winmill, Chief Judge U.S. District Court for Idaho, July 2, 2003, Memorandum Decision in NRDC v. DOE, Civ. No. 01-0413-S-BLM, pg. 11. Also see Settlement Agreement/Consent Order that states: "3. DOE shall treat all high-level waste currently at INEL so that it is ready to be moved out of Idaho for disposal by a target date of 2035." Pg.3

[31] DOE/NE-ID-11226, Pg. 17.

> "In short, the Court concludes that there is a clear indication of the hardship that plaintiffs and the intervenors will suffer if review is delayed, there is no indication that undertaking judicial review at this jucture would interfere with subsequent agency action, and the Court perceives no benefit which would be obtained by allowing further factual development of the issues involved. Under such circumstaces, the Court concludes that Order 435.1 and its mandate that all DOE contractors and entities comply with its provisions, are ripe for jucicial review." [pg.8]
>
> "Conclusion: Therefore, pursuant to its review authority under 5 U.S.C. ss 704 & 706, the Court will deny the Defendants' [DOE] Motion to Dismiss. However, indenying the Defendants' motion the Court makes no ruling as to the merits of Plaintiffs' [NRDC] claims." [32] [Pg.14] Judge B. Lynn Minmill, Chief Judge, US District Court, August 9, 2002, pages noted. [33]

IDEQ claims it has no authority under Hazardous Waste Management Act (HWMA) to regulate radionuclide emissions. IDEQ's response to EDI comment: "This Hazardous Waste Management Act (HWMA) permit does not address 'radioactive materials.' Radionuclides are subject to Atomic Energy Act (ABA) regulation, and therefore beyond the jurisdiction of the HWMA." [34]



Note above Figure: "The stainless steel canisters are then moved into concrete vaults each holding

---

[32] Judge B. Lynn Minmill, Chief Judge, US District Court, August 9, 2002

[33] US Federal District Court for District of Idaho in NRDC v. DOE, Case 1:01-cv-00413-BLW, Document 125 Filed 03/06/2006, Page 2 of 2

[34] Brian R. Monson, Hazardous Waste Program Manager Waste Management and Remediation Division, RE: Final Decision to Issue the Renewal Partial Permit for HWMA Storage and Treatment for the Liquid Waste Management System at the Idaho Nuclear Technology and Engineering Center on the Idaho National Laboratory (INL, EPA ID No. ID4890008952) October 21, 2014, letter to Chuck Broscious.

16 canisters." This suggests DOE's intent for long-term or permanent internment at INL but mention of where these vaults are located. [35]

Consequently, much of INL's National Emission Standards for Hazardous Air Pollutants (NESHAPS) data [36] are not based on monitoring, not even when it is a stack release that has filters. The estimates of the radionuclide and curie amounts are based on calculations that aren't publicly available. Therefore, the public cannot make informed decisions on these dangerous operations.

EDI conducted an assessment of relevant DOE and other agency reports related to the IWTU, and offer them below. The documented evidence will give a reasonable person pause before endorsing DOE's choice of radioactive waste treatment technology (IWTU) and the State of Idaho's ability/willingness to oversee the operation/permitting.

The Liquid Waste Management System (LWMS) is composed of numerous old interim-status permitted accumulation tanks, ancillary piping and four primary treatment units (previously used for the Waste Calciner and the New Waste Calcine Facility incinerators) [37] including:

* The process Equipment Waste Evaporator (PEWE) a closed loop evaporator system with the condensed overheads and still bottoms held for further treatment.
* The Liquid Effluent Treatment and Disposal (LET&D) unit employs fractionation columns to treat the PEWE overheads, recovering a nitric acid stream that is reused.
* The Evaporator Treatment System (ETS), located in CPP-659 further concentrates higher activity liquid wastes.
* The integrated Waste Treatment Unit (IWTU) is a new ("first-of a kind") steam reformer system built to convert the remaining HLW sodium bearing tank farm waste into a solid form. The IWTU includes dry solids and indoor waste pile storage associated with managing the treated waste.

Section II. IDEQ's Proposed Permit Violates Environmental Laws

IDEQ has allowed DOE for many years to "boot-strap" new deadly waste operations like the IWTU onto old Process Equipment Waste Evaporator (PEWE) permits and thereby avoid the otherwise full legal Resource Conservation Recovery Act (RCRA) and Clean Air Act (MACT) permitting process. [38]

DOE's IWTU is required as a matter of law to obtain a RCRA and MACT permit as a new major source facility and not be engrafted as a modification onto the current application that is decades old. [39] This is a jurisdictional issue that requires resolution before the IWTU can receive any legitimacy as a RCRA facility. [40]

The IDEQ illegally relies on the decades old RCRA permit (on record) for the Process Equipment Waste Evaporator (PEWE) and attempts to "boot-strap" **new separate operations in separate buildings** into this new permit modification. [41] Current EPA regulations restrict permit modification to

---

[35] Integrated Waste Treatment Unit October 2017, FLORE Idaho

[36] See: EPA (U.S. Environmental Protection Agency), 1989, *Risk Assessments, Environmental Impact Statement, NESHAPS for Radionuclides*, "Background Information Document, Volume 2," EPA/520/1-89-006-1, U.S. Environmental Protection Agency, Office of Radiation Programs, September 1989.

[37] EDI Preliminary Comments to Idaho Department of Environmental Quality on Calcined Solids Storage Facility Partial Permit Renewal by Chuck Broscious and David B. McCoy, May 2017 and click here for Photos of calcine binsets and predicted flow depths http://www.environmental-defense-institute.org/publications/EDI-CSSF-Permit-S.pdf

[38] Code of Federal Regulations (CFR), National Emission Standards for Hazardous Air Pollutants, Maximum Achievable Control Technology (MACT) Standards for Major Sources 40 CFR 63.40 through 63.44

[39] IDEQ Updated Listing of INL RCRA documents 1/17/07, INTEC Permitting, page 29-30, shows the last full RCRA permit for the Process Equipment Waste Evaporator

[40] 40 CFR 270.42

[41] INL: ILWMS Partial Permit Number: ID4890008952 Effective Date: October 18, 2004 Revision Date: January 23 August, 2006

existing permitted operations. [42] Therefore, IDEQ approval of this new permit modification is bogus because there are no original permits for the IWTU, High-level Liquid Waste Evaporator, Process Equipment Waste Evaporator and Liquid Effluent Treatment & Disposal. These operations needed to obtain individual RCRA permits as new facilities because they were not in existence before 1986. Moreover, the deadline for DOE compliance with the Clean Air Act/NESHAP/MACT standards for these operations was 6/29/98. [43]

In a 7/24/01 letter to EPA's Office of Enforcement, Petitioners Environmental Defense Institute (EDI) and Attorney David B. McCoy [44] petition the Environmental Protection Agency for a hearing or determination that the MACT requirements of 40 CFR 63 Subpart DD, MACT requirements of 40 CFR 63 Subpart VVV (40 CFR 63.1580 et seq.) for industrially operated Publicly Owned Treatment Works/Federally Owned Treatment Works (POTW/FOTW), and the requirements of 40 CFR 63 Subpart VVV (40 CFR 63.1580 et seq.) as a "Major Source Category" under "Site Remediation" be applied to the INL facility. For the reasons set forth below, Petitioners submit that the MACT standards should be applied to the INL facility.

EDI protests DOE's attempt, with EPA and IDEQ complicity, to circumvent applicable Resource Conservation Recovery Act (RCRA), Clean Air Act, and Clean Water Act regulations. EDI's above complaint with EPA challenging the agency's intent to grant Idaho final Hazardous Waste Management Act and Resource Conservation Recovery Act permitting authority based on IDEQ's past and current inadequate enforcement of these crucial environmental laws. [45] EDI also filed a Complaint with EPA Office of Inspector General challenging IDEQ's lax enforcement. For information see the EPA/Office of Inspector General's critical response. [46]

IDEQ states, "The proposed IWTU is not considered a combustion technology. Although steam reforming is **not subject to the Maximum Achievable Control Technology (MACT)** standards for hazardous waste combustion, the IWTU is designed to meet these standards." [47] [emphasis added] This is a clear obfuscation of Clean Air Act regulatory enforcement. IDEQ is required by law to state that the IWTU **SHALL** meet MACT emission standards. [48]

> "Any emissions generated during the [IWTU] treatment campaign will be filtered through high-efficiency particulate air (HEPA) and Granulated Activated Charcoal filters and sampled to ensure regulatory requirements are met. Steam reforming is used successfully in a variety of chemical and petrochemical applications. It is currently being used at a facility in Erwin, Tenn., to primarily treat radioactive resin wastes from commercial nuclear facilities." [49]

DOE's report prepared to document the physical, chemical and radiological properties of plutonium oxide materials that were processed in the Plutonium Fuel Form Facility (PuFF) Savannah River Site

---

[42] 40 CFR 270.42(a)(i) Subpart D Changes to Permit. 6/7/05

[43] 40 CFR 63.42. Also see EPA Office of Inspector General 3/9/05 Evaluation Report "Substantial Changes Needed in implementation and Oversight of Title V Permits If Program Goals Are to Be Fully Realized."

[44] Attorney David B. McCoy (California Bar #170737) is an EDI Board member.

[45] When Petitioners [EDI et al.] ask, "Where are the permits?" EPA and IDEQ pretend that interim status is a substitute for a permit although RCRA requires permitted facilities during their operational lifetimes. Interim status operations have continued for longer periods than permitted operations could have continued. 42 U.S.C. §6925 reflects Congressional intent to limit interim status operations. One only has to read the Rebuttal submitted by Petitioners to realize the large number of legal and factual issues which the EPA has refused to acknowledge or address in its 7/1/02 letter or EPA's earlier Response. See Environmental Defense Institute, Keep Yellowstone Nuclear Free and David McCoy Petition to Environmental Protection Agency Inspector General, 7/8/02. See EDI Website, http://environmental-defense-institute.org/publications

[46] EPA Office of Inspector General, Evaluation Report, Review of EPA's Response to Petition Seeking withdrawal of Authorization for Idaho's Hazardous Waste Program, Report No. 2204-P- 00006, 2/5/04.

[47] IDEQ Fact Sheet, 1/26/07, page 3.

[48] 40 CFR 63.43

[49] Integrated Waste Treatment Unit October 2017, FLORE Idaho

has similar radioactive waste treatment emission issues as the INL IWTU. INL's INTEC also was/is also involved in the production of Pu-238 for space batteries so the IWTU waste streams have similar characteristics. This report below shows how difficult it is to filter emissions relying on HEPA filters. The DOE report states:

"An understanding of these properties is needed to support current project planning for the safe and effective decontamination and deactivation (D&D) of Plutonium Fuel Form Facility (PuFF). The production process produced micron-sized particles which proved difficult to contain during operations, creating personnel contamination concerns and resulting in the expenditure of significant resources to decontaminate spaces after loss of material containment. This report examines high 238Pu-content material properties relevant to the D&D of PuFF. These relevant properties are those that contribute to the mobility of the material. Physical properties which produce or maintain small particle size work to increase particle mobility.

"Operational experience at PuFF indicates that the Pu-238 contamination was observed to move along surfaces and through High Efficiency Particulate Air (HEPA) filters over time. Recent research into the phenomenon known as alpha recoil offers a potential explanation for this observed behavior. Momentum is conserved when an alpha particle is ejected from a Pu-238 atom due to radioactive decay. Consequently, the entire particle of which that Pu-238 atom is a constituent experiences a movement similar to the recoil of a gun when a bullet is ejected. Furthermore, the particle often fractures in response to Pu-238 atom disintegration (yielding an alpha particle), with a small particle fragment also being ejected in order to conserve momentum. This process results in the continuous size reduction and transport of particles containing Pu-238 atoms, thus explaining movement of contamination along surfaces and through HEPA filters.

"**2.4 Baseline Particle Size Distribution**

"PuO2 was received in the PuFF cells as calcined powder. This processing step involves heating the oxalate precipitates, driving off any remaining moisture and oxalic ions. Nominal furnace temperature during calcining is 735°C.8 This dries the plutonium oxalate precipitate and converts the plutonium oxalate precipitate to plutonium-oxide, PuO2. The initial particle size has been observed to be sensitive to both oxalate precipitation technique and calcination temperature. "These rates of dissolution are small and dependent on factors such as the pH, temperature, the presence of oxidizing, reducing or complexing agents, the surface areas of the particles, and the history of the sample.1 Fleisher17 proposed an explanation for this behavior based on alpha recoil. In this model, subparticles would be produced as recoiled aggregates.

"The differences in "dissolution rates" between 238PuO2 and 239PuO2 were postulated to be controlled by radiation damage and that alpha decay occurring near the surface of the particle ejects a certain number of atoms from the particle reducing its overall size. Figure 7 illustrates this model with a schematic. An alpha particle can only travel a short distance in PuO2. The range of an alpha particle was determined to be approximately 12 microns in UO2, PuO2 and ThO2 phases.18 Hence, a dotted line denotes the recoil range which is the zone around the outside surface of the particle where it would be possible for the recoil from an alpha decay to generate a fragment. Several studies on dispersion of materials by the alpha recoil mechanism were reviewed by Icenhour.

"The review concluded, "The recoil energy resulting from alpha decay is sufficient to re-suspend nanometer-sized particles from a filter fiber. Particles with densities of 10 g/cm3 and up to 20 nm in diameter can be dislodged. While alpha-recoil energy is not sufficient to re-suspend micron or submicron particles, fragmentation can lead to the production of even smaller particles that can be resuspended."

"The reason alpha recoil is insufficient to dislodge larger particles is due to conservation of momentum. The recoil energy is inversely proportional to the particle's mass. For example, a recoiled daughter product of Pu238 (i.e., U234) by alpha decay of a 5.5 MeV alpha particle has been determined to have an energy of ~100 keV (the mass ratio of U234: alpha particle is ~ 59:1) and a 10 nm recoiled particle fragment would have an energy of Approximately 1eV. As mass increases and recoil energy drops, particle ejection from a surface becomes implausible. However, fragments up to 20 nm could be dispersed in air and facilitate the release of PuO2 to the environment if filtration technology is not adequate re-capture these particles. The decrepitation and re-distribution of materials has been modeled based on the activity of the species concerned and determined that release rate is dependant on lattice damage by recoil nuclei and alpha particles, as well as radiolytic effects. The range of recoiling particles in air resulting from alpha decay with energies of 6 MeV is about 0.12 mm, so fragments re-distributed by this mechanism will not travel large distances without the assistance of other transport mechanisms (e.g., entrainment in air currents, dissolution or transfer by contact). The settling of particles in this range of sizes is very slow and dominated by Brownian motion (see Section 3.0). However, it is not expected that the phenomenon of alpha recoil could result in transport of contamination of significant distance against air currents. [PG10&11]

"There is currently much debate on the efficacy of a HEPA-type filter for airborne nano-particulates. However, the

current National Institute of Safety and Health (NIOSH) document with recommendations on safe handling of nanoparticles has suggested that a HEPA-type filter will effectively remove airborne nanoparticles. HEPA filters will collect 99.97% of particles down to and including 0.3 μm (300 nm).

" It is recommended that a multi-stage or graduated filter system with progressively small filter media be used for added protection. Additionally, an ultra low penetration air filter may be used with effectiveness down to 0.12 μm with 99.999% efficiency. However, this does not include the predicted size range of ball-milled particles which include particles in the 10-30 nm range. *There are no filters currently rated for particle collection in this size range*. However, the current suggestions for safe handling of nanoparticulate materials include the use of a HEPA-like filter system for capture of all airborne particulates. This information also does not take into account the effects of alpha recoil, which has been suggested by some to cause nanoparticles to deviate from normal classical penetration models.

"The above discussion concludes that particles will be caught in a series of HEPA-like filters; however, the additional alpha recoil phenomena has not yet been factored into the filter efficiency consideration. Some have concluded that alpha-emitting particulates penetrate HEPA filters much more readily than Beta-emitting or non-radioactive particles.19 This trend has been observed for Pu-238 specifically at SRS where multiple grams of particles were detected beyond the first HEPA filter layer30 . Aggregate recoil particles, which are produced from larger particles, are re-entrained into the airflow and deposited deeper into the filter, or onto a subsequent filter in the series. However, it is still believed that sub-micron sized particles will eventually be entrained in the filter due to Brownian motion collisions with the filter media and the adsorbed water layer, which enhances adhesion with the filter. One HEPA filter is obviously not sufficient to capture all particles and subsequently ejected particles due to alpha recoil. It is also necessary to change filters frequently so that particles ejected from the last filter layer cannot become re-entrained into the air. [pg15]

"Alpha recoil driven decrepitation may occur and hinder the containment of these particulates or their capture on filter media as has been shown in previous studies." [50]

The Integrated Waste Treatment Unit (IWTU) "steam reformer" meets the regulatory definition of a "combustion device" [51] or controlled prophetic high-temperature burn (>1,190 degree C). [52] These combustion temperatures are achieved by adding fuel in the form of combustible carbon (coal) and oxygen as a means of maintaining the high temperature for reducing the waste in a fluidized bed to a fine powder like and highly leachable waste product. [53] This is an issue because there is no disposal path forward for the IWTU waste and thus may remain in Idaho indefinitely. The McGrill leach studies of the waste show 100% of the radioactive cesium leaches out in two days. This waste powder poses a significant hazard to Idaho's sole source aquifer given the fact that it will be in indefinite long-term storage at INL (in a flood zone) until a final geologic disposal site is permitted. The IWTU replaces the New Waste Calciner incinerator that was designed to process the remaining "sodium-bearing" high-level liquid waste at the INTEC Tank Farm but was shut-down because it could not meet emission control MACT regulations.

See Figure 9 below that shows how the HEPA filter efficiency drops with smaller particle size.

---

[50] Properties and Behavior of 238Pu Relevant to Decontamination of Building 235-F June 2009 PG 15 & 19,SRNL-STI-2009-00239 http://www.osti.gov/energycitations/product.biblio.jsp?query_id=0&page=0&osti_id=969795

[51] 40 CFR 63.111

[52] Volume 14 – ILWMS HWMA/RCRA Permit Class 3 PMR/RTA February 2019, Appendix I states: "9. Technology changes needed to meet standards under 40 CFR part 63 (Subpart EEE—National Emission Standards for Hazardous Air Pollutants From Hazardous Waste Combustors), provided the procedures of §270.42(j) are followed. 10. Changes to RCRA permit provisions needed to support transition to 40 CFR part 63 (Subpart EEE—National Emission Standards for Hazardous Air Pollutants From Hazardous Waste Combustors), provided the procedures of §270.42(k) are followed."

[53] RCRA PERMIT FOR THE IDAHO NATIONAL LABORATORY Volume 14 INTEC Liquid Waste Management System Appendix II Figure 22. Normal operations case temperature profile, axisymmetric. [pg. 38] "1199.00 degrees" also Section D, Diagram Package Revision Date: November 27, 2017, "Table VI-1. IWTU Automatic Waste Feed Cutoff shows CRR [carbon reduction reformer] temperature TC-C-160-4 CRR average bed temperature >1100 C." [pg. 79].

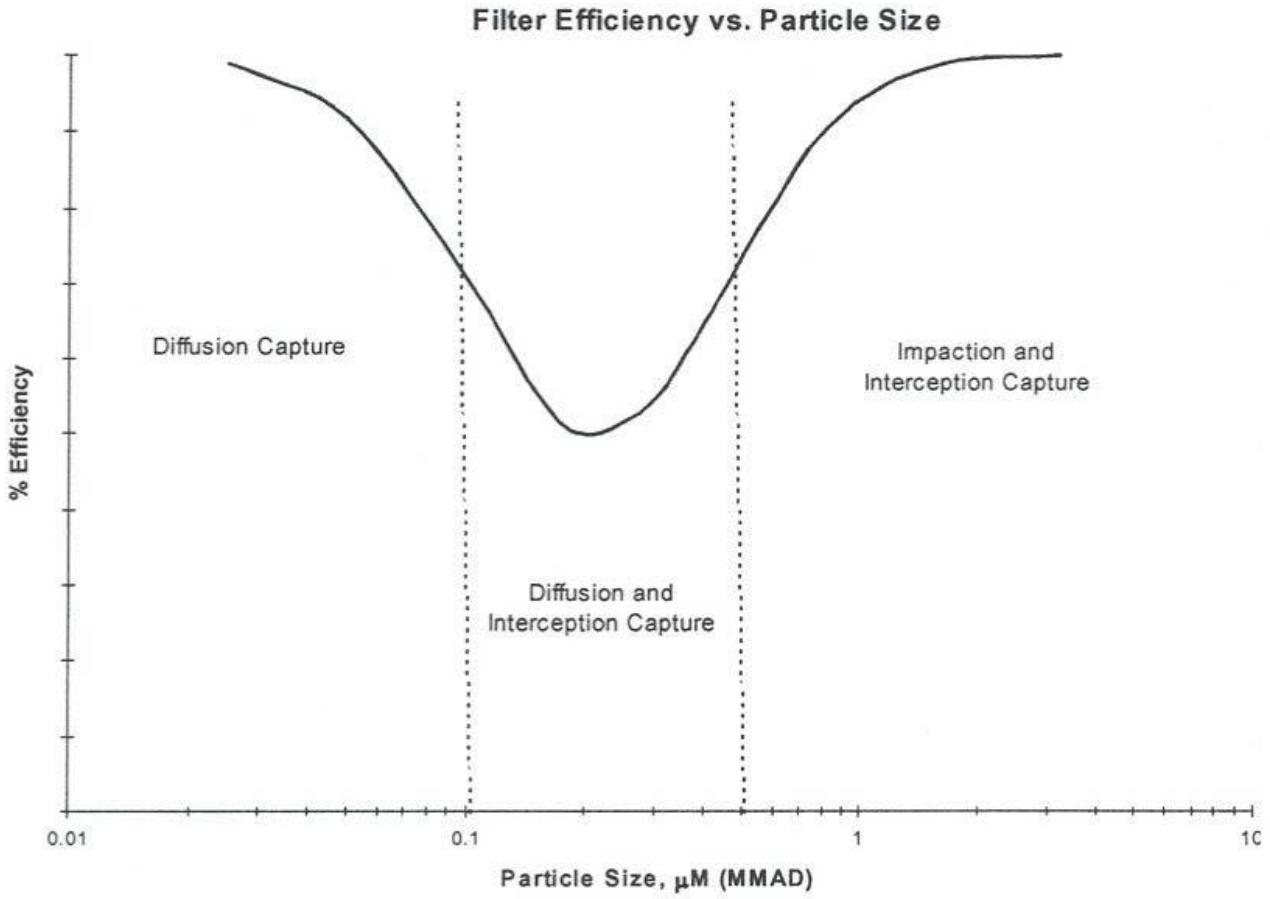


Figure 9: Schematic of filter efficiency with respect to particle size (MMAD is mass median aerodynamic diameter). [pg14] [54]

Regardless what DOE calls this IWTU and other high-level/TRU waste operations, IDEQ must independently define it by a characterization of the treatment process implemented and the required regulatory emission control standards applied.

"A temperature of 1,190 C is the same as the operating temperature in the turbine (hot end, in the direct blast of the burning fuel/air mixture) of a jet engine. This is bright red heat, enough to melt copper & incinerate almost anything, but the mere idea of burning previously classified high level waste & not monitoring or controlling the resulting emissions seems to me to be beyond stupid & without regard to public safety," notes a University of Idaho Engineering Materials Science professor.

DOE's Permit Modification claims the new IWTU will process "approximately 836,000 gallons of mixed liquid waste, containing both hazardous and radioactive components stored in three 300,000- gallon [high-level waste] tanks." These are only current inventories and do not include DOE plan for spent nuclear fuel reprocessing at the INL Materials and Fuels Complex that will generate significant volumes of "newly-generated" high- level liquid waste. This is an enormous amount of extremely deadly waste to treat and the potential for significant emissions (absent appropriate

[54] Properties and Behavior of 238Pu Relevant to Decontamination of Building 235-F June 2009, PG 14, SRNL-STI-2009-00239 http://www.osti.gov/energycitations/product.biblio.jsp?query_id=0&page=0&osti_id=969795

application of EPA emission Standards) that could affect the public health and the environment must be recognized.

DOE states: "The units that comprise the [INTEC Liquid Waste Management System] ILWMS are capable of handling high-level, transuranic, and low-level radioactive wastes. Activities of typical wastes range from 20 nCi/g to 50,000 nCi/g. [55] The exposure rates associated with these process solutions routinely exceed 100 mrem/hr. and can pose a potentially serious hazard to workers at the INL if appropriate protective measures such as time, distance and shielding are not applied." [56]

DOE's reported plan for reprocessing of spent nuclear fuel (SNF) at INL lends credence to public concerns that the ILWMS and the IWTU are not just dedicated to treating existing high-level waste tank inventories, but also facilitating managing "newly-generated-waste" from reprocessing of SNF. [57]

DOE/IDEQ Permit Modification Discussion of Process Vents

"Process Vent" is a broad regulatory category for a major source of hazardous air pollutants that must comply with more restrictive EPA emission regulations. DOE continues to side-step compliance with these emission regulations with bogus assertions that their hazardous and radioactive waste treatment operations are not Process Vents. IDEQ states, "The IWTU is designed [**not required**] to meet Hazardous Waste **Combustor** MACT standards which are more stringent than the emission standards for process vents IDAPA 58.01.05.008 [40 CFR 264 Subpart AA]. Also, steam reforming is not a technology regulated under the process vent standards, thus the process vent standards are neither applicable nor appropriate for the IWTU." [58] [emphasis added]

IDEQ is complicit in this charade by allowing DOE's obfuscation of the relevant laws. Again DOE states:

> "II.M.1.d. The Integrated Waste Treatment Unit (IWTU) uses a two stage steam reformation process to treat the waste. The IWTU process does not involve distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping. The IWTU vent does not meet the definition of a process vent at IDAPA 58.01.05.008 [40 CFR § 264.1031]. Therefore, the air emission standards for process vents do not apply." [59] [pg33]

DOE/IDEQ claim: "The IWTU does not involve distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations. As such, the IWTU stack does not meet the definition of a process vent in IDAPA 58.01.05.008 (40 CFR § 264.1031) and the requirements specified in 40 CFR 264 Subpart AA do not apply." [60]

However, 40 CFR 264.1031 states: "Process vent means any open-ended pipe or stack that is vented to the atmosphere either directly, through a vacuum-producing system, or through a tank (e.g., distillate receiver, condenser, bottoms receiver, surge control tank, separator tank, or hot well) associated with hazardous waste distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations." [61] There are multiple radioactive/hazardous waste stacks for the numerous INTEC Liquid Waste Management System (LWMS) operations as well as other INTEC

---

[55] The definition of Transuranic Waste is "radioactive waste that is not classified as high-level radioactive waste and contains more than 100 nano-curies per gram of alpha-emitting transuranic isotopes with half-lives greater than 20 years."

[56] Permit Modification, Attachment 2, Section C, pg. 2-6. (nCi/g = nano Curies per gram) (mrem/hr. = millirem per hour)

[57] Permit Modification, Attachment 2, Section C, pg.12.

[58] IDEQ Fact Sheet, 1/26/07, page 5.

[59] PARTIAL PERMIT FOR HWMA STORAGE and TREATMENT LIQUID WASTE MANAGEMENT SYSTEM at the IDAHO NUCLEAR TECHNOLOGY & ENGINEERING CENTER Revision Date: November 27, 2017 Book 1 of 4, Pg. 33. Hereinafter Partial Permit Book 1.

[60] Permit Modification , Attachment 2, Section C, pg. 2-52

[61] "Distillation operation means an operation, either batch or continuous, separating one or more feed stream(s) into two or more exit streams, each exit stream having component concentrations different from those in the feed stream(s). The separation is achieved by the redistribution of the components between the liquid and vapor phase as they approach equilibrium within the distillation unit.

"Fractionation operation means a distillation operation or method used to separate a mixture of several volatile components of different boiling points in successive stages, each stage removing from the mixture some proportion of one of the components.

"Distillate receiver means a container or tank used to receive and collect liquid material (condensed) from the overhead condenser of a distillation unit and from which the condensed liquid is pumped to larger storage tanks or other process units."

operations using the same stacks, and regulations require that they cumulatively be included under the "major source" criteria. [62]

Clearly, the IWTU meets two or more of the above definitions of a "process vent" under 40 CFR 264.1031. DOE cannot credibly claim exemption of this crucial emission control regulation. Moreover, IDEQ must ensure that DOE is not allowed to use this unfounded exemption. Also see detailed discussion on the IWTU Permit Modification below.

> DOE's Permit Modification includes other liquid waste treatment units and claims: "[Evaporator Tank System] ETS off-gas is processed through vessel off-gas systems in Buildings CPP-604 and CPP-659 respectively and then sent to the APS in Building 649, prior to discharge to the main stack. Therefore, the ETS vents do not meet the definition of a process vent and IDAPA 58.01.05.008 [40 CFR § 264.1031] does not apply." [63]

The IWTU and ETS meet one or more of the above definitions of a "process vent" under 40 CFR 264.1031. The partial permit does not cover all of the appropriate/applicable regulations because IDEQ fails to require the actual treatment classification:

> "The Permittee shall comply with all of the terms and conditions of this Partial-Permit (Permit) and Attachments 1 through 9 of this Permit. The Permittee shall comply with all applicable state regulations, including IDAPA 58.01.05.004 through 58.01.05.013 [40 Code of Federal Regulations (CFR), Parts 124,260 through 266, 268, and 270], and as specified in this Permit. Applicable state regulations are those which are in effect on the date of final administrative disposition of this Permit and any self-implementing statutory provisions and related regulations which, according to the requirements of the Hazardous and Solid Waste Amendments (HSWA), are automatically applicable to the Permittee's hazardous waste management activities, notwithstanding the conditions of this Permit.
>
> "This Permit is based upon the administrative record, as required by IDAPA 58.01.05.013 [40 CFR § 124.9]. The Permittee's failure (in the Application or during the permit-issuance process) to fully disclose all relevant facts or the Permittee's misrepresentation of any relevant facts, at any time, shall be grounds for the termination or modification of this Permit, and/or initiation of an enforcement action, including criminal proceedings. Any challenges to the EPA-enforced condition shall be appealed to EPA, in accordance with 40 CFR § 124.19." [64] [pg1]

The above DOE Permit does not implement new: "EPA (2005) recommendations that organics and metal emission limits be increased by factors of 2.8 and 1.45 respectively, to account for potential increases in emissions due to process upset conditions." [65] Also, there is no apparent cumulative hazardous/radioactive emissions data for all the INTEC operations using the same Main Stack, other co-located stacks, and the new IWTU stack as required in the regulations. This is a crucial issue because during 2003, INTEC released 6,002 curies of radioactive emissions to the atmosphere. About 1,650 curies were estimated to have been released to the air at INTEC in 2011; Table 3-3 summarizes the radiological air emissions at the INTEC that were greater than one curie or contributed at least one percent of the total estimated dose to the [maximally exposed individual] MEI. [66]

By any standards, this is an enormous amount of radiation to the environment! According to DOE's Technical Basis for Environmental Monitoring and Surveillance at the Idaho National Laboratory Site:

> **"3.1.2 Summary of Historic INL Site Releases**
>
> This section contains a brief summary of historic releases. More detailed discussions are available in other publications, including CDC (2002), annual Site environmental reports, NESHAPS reports, and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) documents available in the INL Administrative Record (http://ar.inl.gov/).
>
> ***3.1.2.1 Airborne Effluents***
>
> The INL Site was originally established as a government site to build, test, and operate nuclear reactors. During the period from 1952-1989, approximately 13.5 million Ci of radionuclides, primarily fission products, released from

[62] 40 CFR 63.112
[63] Permit Modification, Attachment 2, page 2-52
[64] Partial Permit Book 1, Pg. 1.
[65] Permit Modification, Attachment 1, page 1-D-138
[66] DOE-ID 2012a, Table 3-3, Pg. 3-7.

the INL Site in airborne effluents were characterized as operational releases (DOE-ID 1991). By comparison, an estimated 800,000 Ci were released as episodic releases during the same period. DOE-ID (1991) classified atmospheric releases as operational or episodic because of differing requirements for atmospheric dispersion calculations."

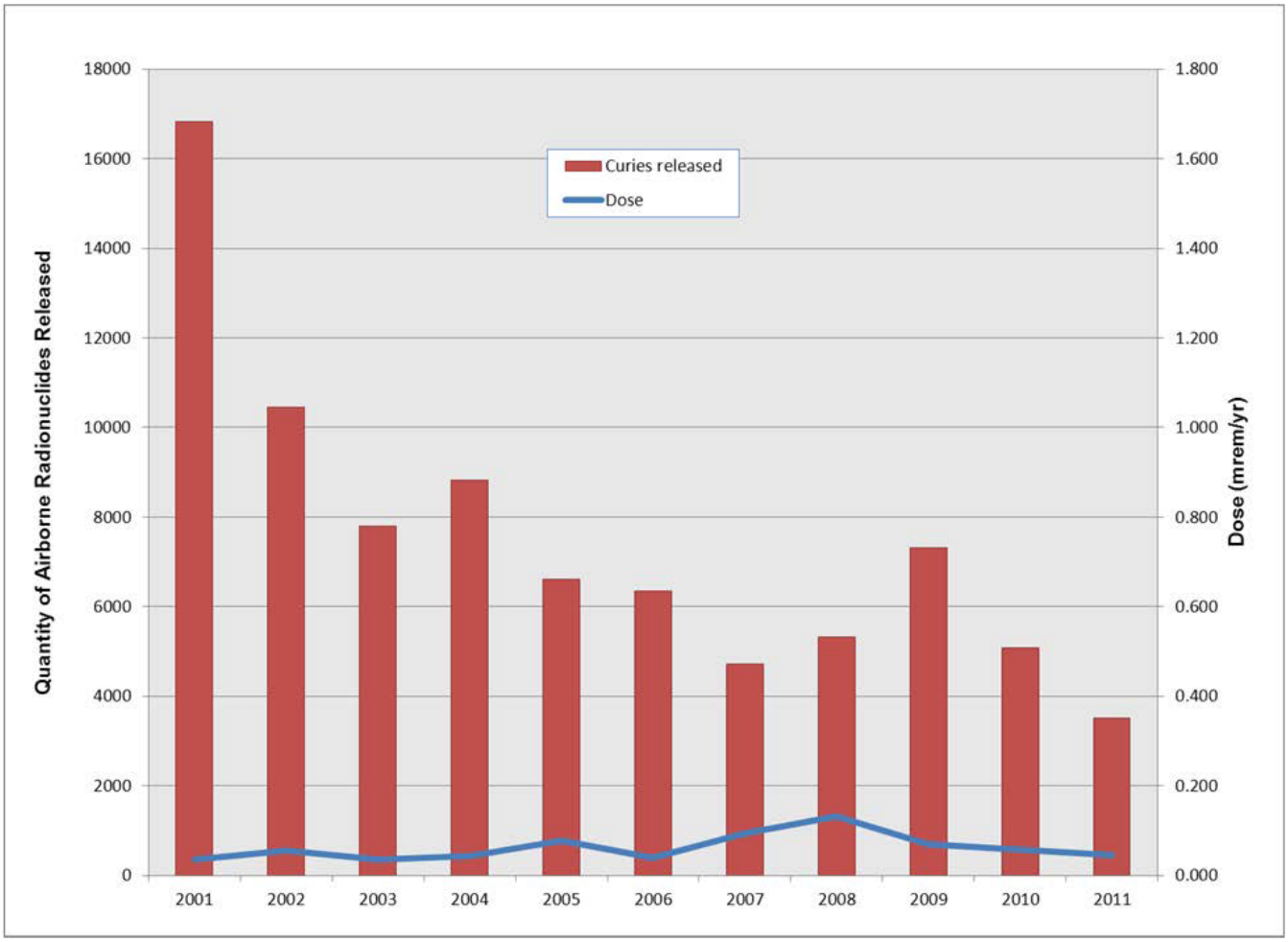
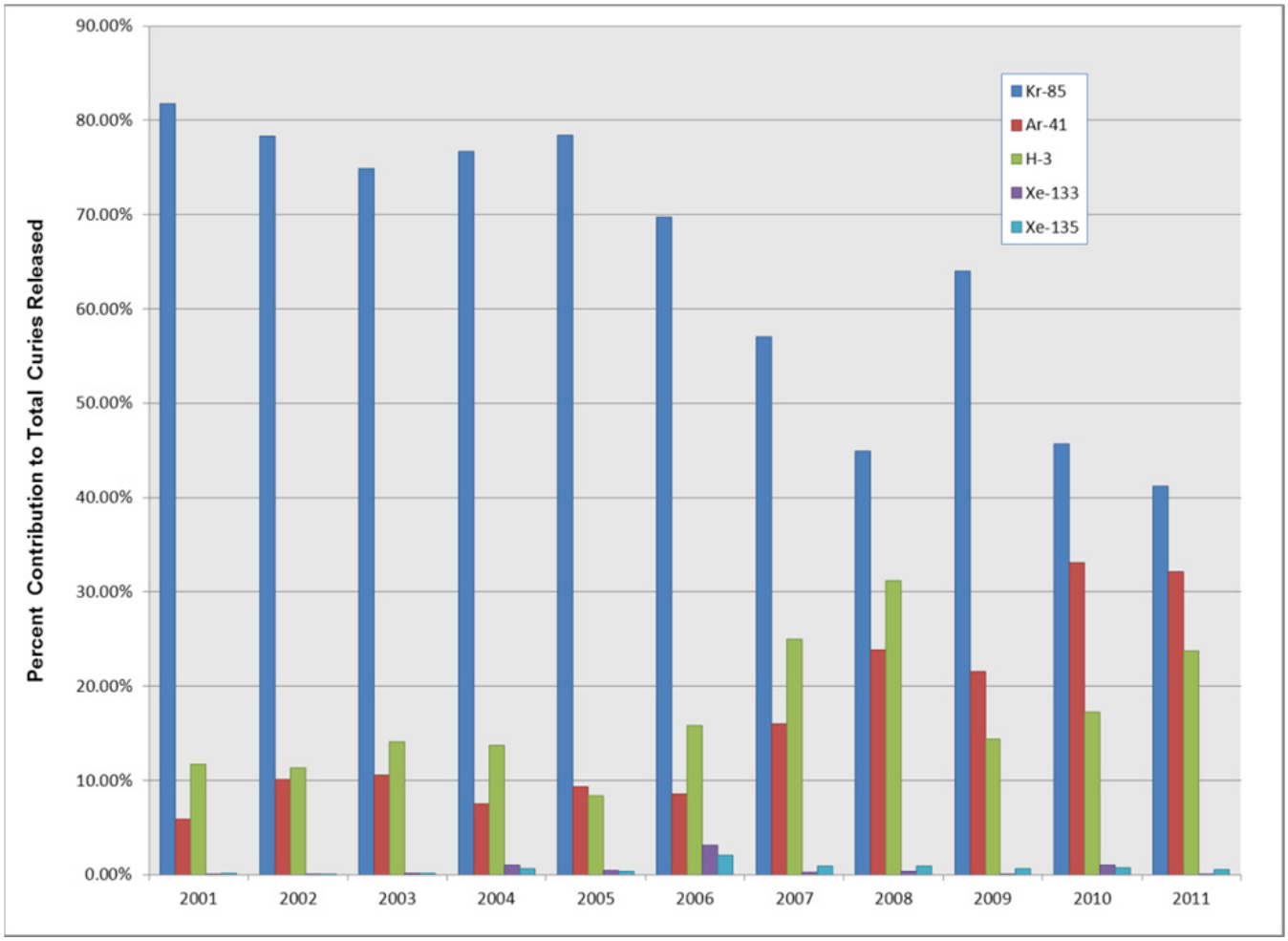


Figure 3-9. Total curies released in air and dose to the MEI calculated by CAP-88 (2001–2011). [Pg.3-16]


Percent Contribution to Total Curies Released
90.00%
80.00%
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Kr-85
Ar-41
H-3
Xe-133
Xe-135

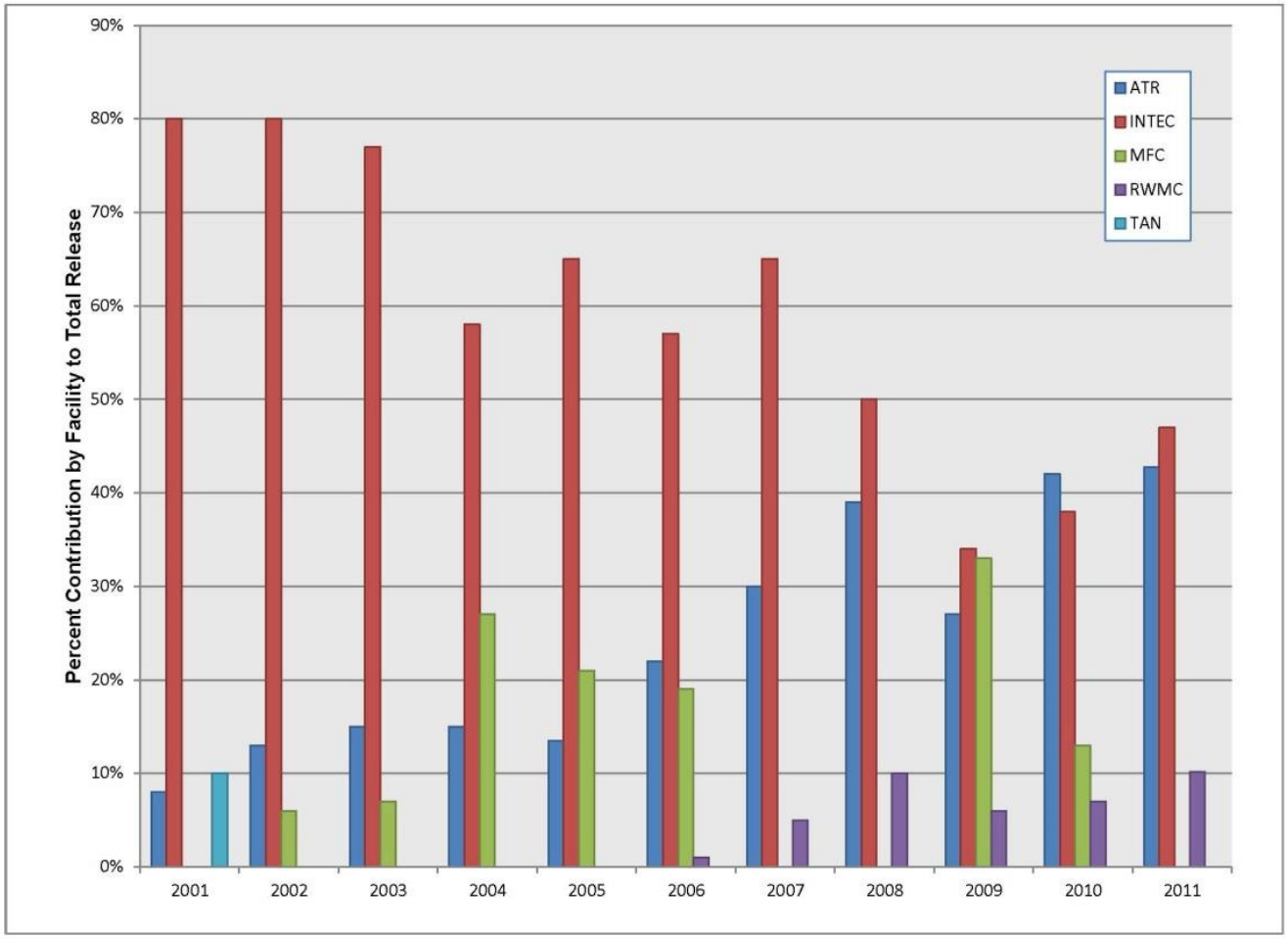


Figure 3-11. Percent contributions, by facility, of INL Site airborne radionuclide releases (2001–2011). [Pg. 3-17]

"INTEC's contribution has decreased from greater than 75% during the years 2001–2003, to less than 70% of the total during 2004–2011. The largest facility contributors to the airborne emissions are currently INTEC, MFC, ATR Complex, and RWMC. For the purpose of this technical basis document, 2007–2011 are considered to be representative of current emissions. Tritium (H–3), argon–41, strontium–90, iodine–129, cesium–137, americium–241, plutonium–238, plutonium–239, and plutonium–240 were the top dose contributors, each representing greater than three percent of the annual dose estimated for the MEI from 2007–2011 (Figure 3-12). The relative ranking of these radionuclides for each year are shown in Table 3-5."

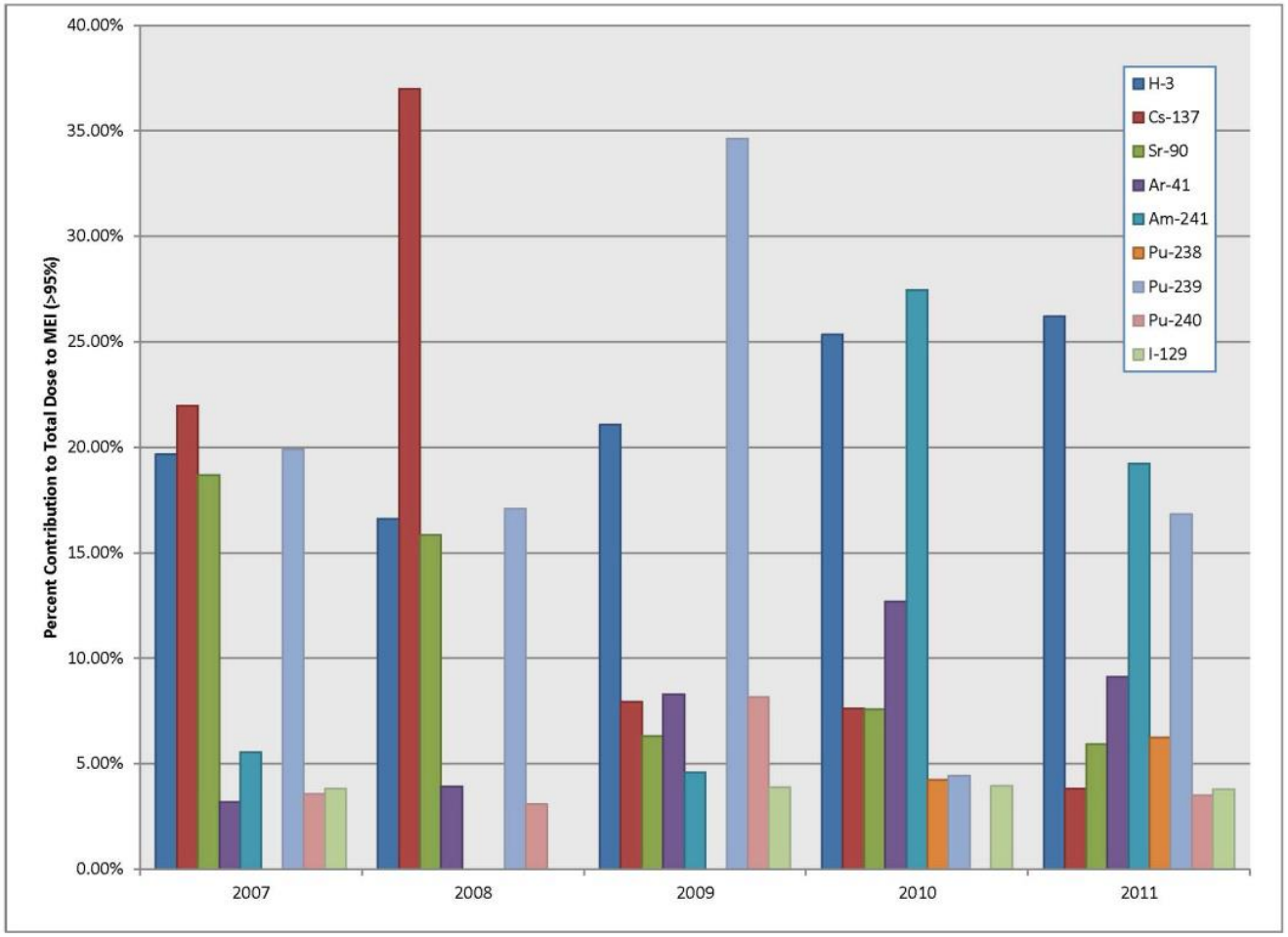


Figure 3-12. Percent contribution by radionuclides contributing greater than 3% to dose to the MEI calculated in NESHAP reports for 2007–2011. [PG. 3-18]

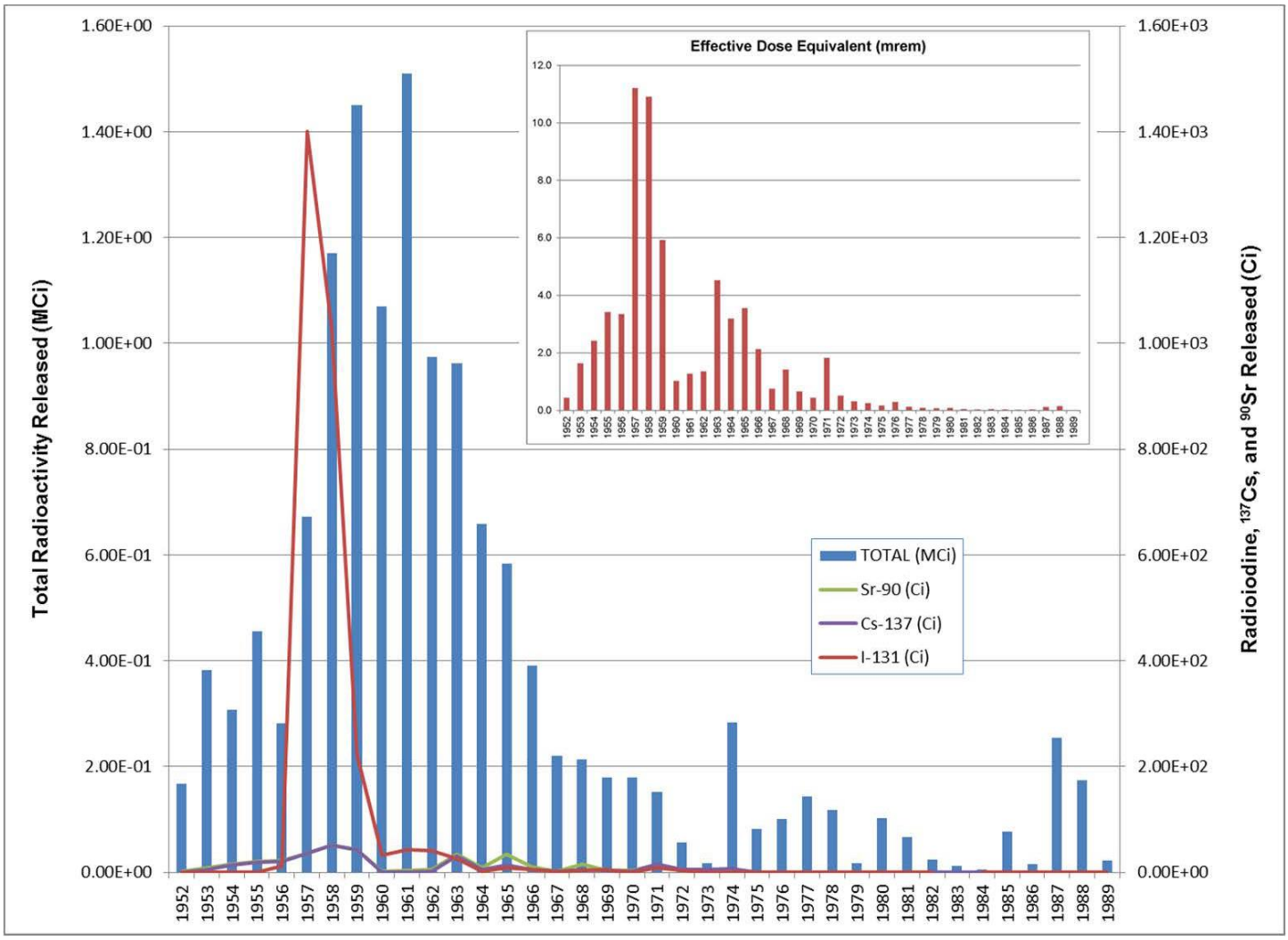


Figure 3-8. Total radionuclide, radioiodine, cesium–137, and strontium–90 atmospheric releases from the INL Site and estimated EDE to the maximally exposed adult from 1951 through 1989. (Data from DOE-ID 1991). [pg. 3-15] [MCi = million curies]

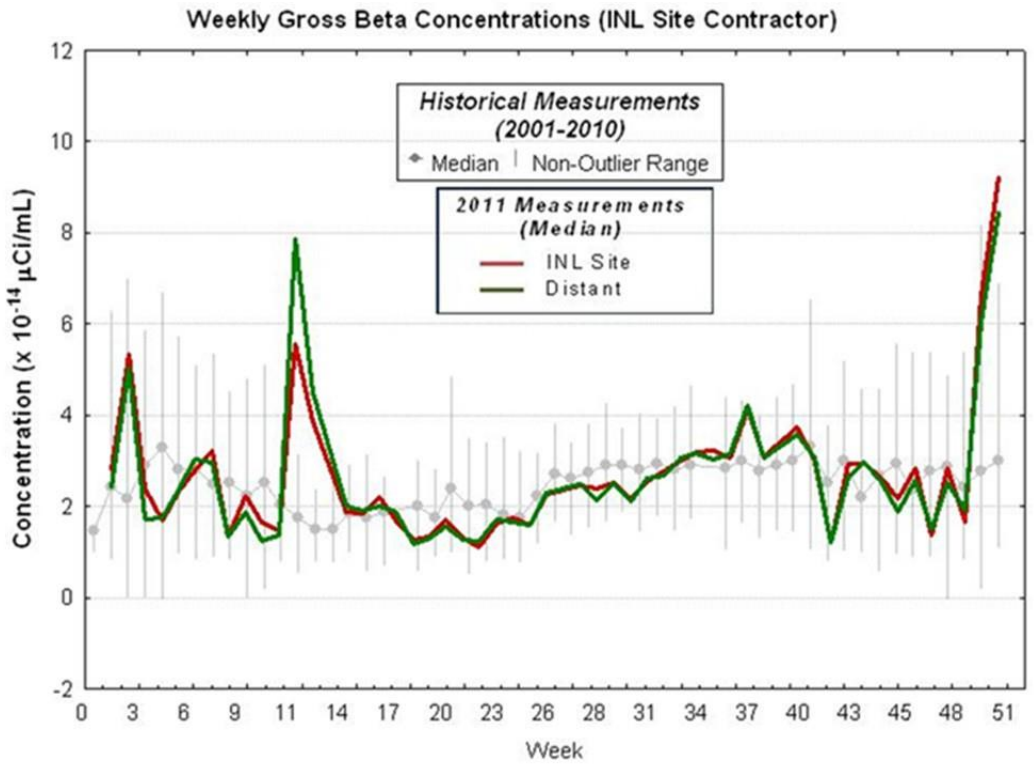
Relative Rank[a]	2007	2008	2009	2010	2011
1	Cs–137	Cs–137	Pu–239	Am–241	H–3
2	Pu–239	Pu–239	H–3	H–3	Am–241
3	H–3	H–3	Ar–41	Ar–41	Pu–239
4	Sr–90	Sr–90	Pu–240	Cs–137	Ar–41
5	Am–241	Ar–41	Cs–137	Sr–90	Pu–238
6	Pu–240	Pu–240	Sr–90	Pu–238	Sr–90
7	I–129		Am–241	Pu–239	Cs–137
8	Ar–41		I–129	I–129	I–129
9					Pu–240

a. Ranked according to contribution to the total dose calculated by CAP88-PC for compliance with NESHAP.

Above Figure 3-8. Total radionuclide, radioiodine, cesium–137, and strontium–90 atmospheric releases from the INL Site and estimated EDE to the maximally exposed adult from 1951 through 1989." (Data from DOE-ID 1991). [pg. 3-15] [MCi = million curies]

"Routine ambient air monitoring at the INL Site and in the surrounding region began in the 1950s (http://www.gsseser.com/Annuals/2010/PDFs/Monitoring-History-Supplement%202010%20Final.pdf). The results of decades of monitoring are available publicly in annual site environmental reports and in the reports referenced below. The adoption of a 10 mrem effective dose equivalent standard for airborne emissions of radionuclides in 40 CFR 61.92 accentuated the need for fully documented and verified measurements. The annual NESHAP reports that present these data are submitted to EPA annually and are also available to the public." [pg. 6-3]
"Section 6.1 Program Basis
Environmental monitoring of air is conducted because air is the primary exposure pathway to humans from contaminants released to the atmosphere from current activities and from re-suspension of soil contaminated from INL Site airborne releases or fallout. Humans and terrestrial biota can receive a radiation dose from inhalation of, ingestion of, or external exposure to radionuclides in the air (Figure 1-1). Airborne emissions at the INL Site are generated from various facilities." [pg. 5-43] [67]

[67] Technical Basis for Environmental Monitoring and Surveillance at the Idaho National Laboratory Site February 2014 DOE/ID-11485 Prepared for the U.S. DOE. Hereinafter DOE/ID-11485.



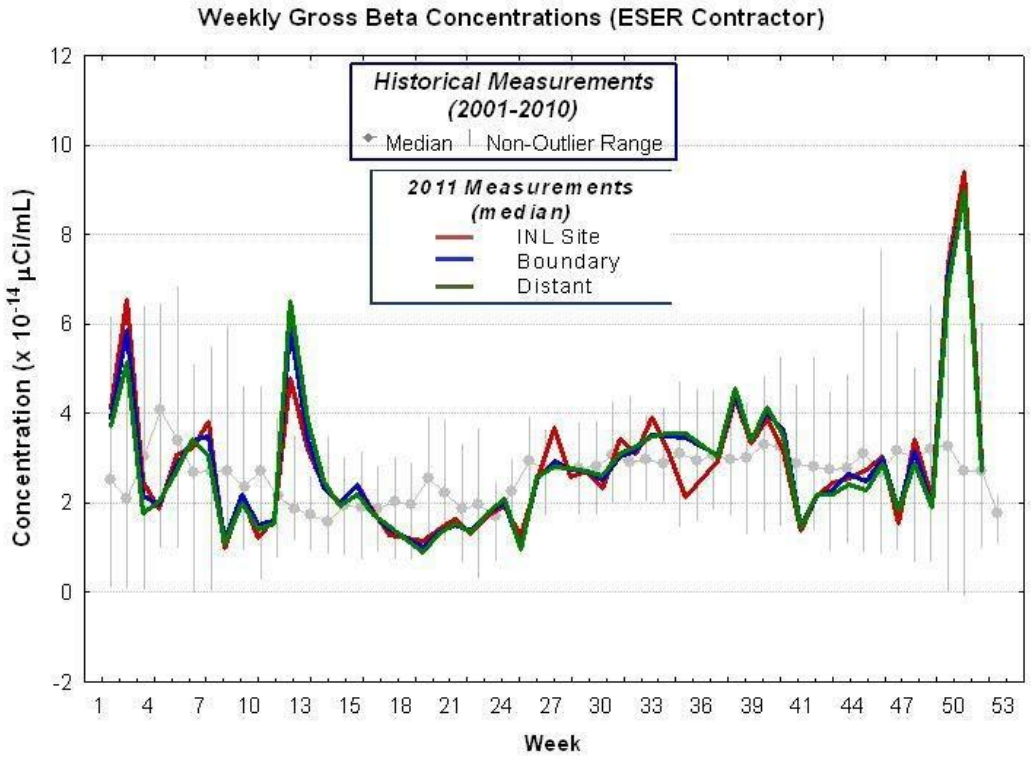


Figure 6-3. Median weekly gross beta concentrations in air (2001–2011). The first figure represents the results from the BEA ambient air monitoring program. The second figure represents the results from the ESER component of the ambient air monitoring program (DOE-ID 2012b). [pg. 6-7]

What confidence can the public attribute to these grossly inappropriately applied standards?

It is now up to the Idaho Department of Environmental Quality to review this DOE Permit Modification Request and issue its findings. In the past, IDEQ chose to put the politically expedient ruling of Idaho's single largest employer ahead of public health and safety. Public comment is crucial to reversing this misguided priority.

DOE claims the IWTU is not a thermal treatment or an incinerator. However the permit shows (as noted above) extremely high operating temperatures exceeding 1,199 C referenced below:

Table VI-1. IWTU Automatic Waste Feed Cutoff

TC-C-160-4 [carbon reduction reformer] CRR average bed temperature≥1100 C

TC-C-160-4 [carbon reduction reformer] CRR average bed temperature <850 C [68] [emphasis added]

The following list identifies the location of information required per IDAPA 58.01.05.012 [40 CFR 270.42(c) (1) (iv)].

IDAPA 58.01.05.012 (40 CFR 270.62) Incinerators Not Applicable

IDAPA 58.01.05.012 (40 CFR 270.19) Incinerators Not Applicable [69]

[Source: Class 3 PMR/RTA February 2019, [Permit Pg. 7]

The [Denitration Mineralization Reformer] DMR generally operates between 2 and 8 psig in the area above the bed with an average bed temperature of 580°C - 680°C when producing a carbonate-rich treatment product. [Source: Permit pg24]

Figure 22. Normal operations case temperature profile, axisymmetric "**1199.00 degrees**" .
[INL HWMA/RCRA INTEC Liquid Waste Management System Permit Attachment 1, Section D, Process Information [70] Volume 14 Revision Date: November 27, 2017, [Source: Permit pg. 38]

Table VI-1. IWTU Automatic Waste Feed Cutoff

TC-C-160-4 CRR average bed temperature >**1100 C**

TC-C-160-4 CRR average bed temperature <**850 C**

[Volume 14 INTEC Liquid Waste Management System Appendix II Section D, Diagram Package Revision Date: November 27, 2017. [71] [Source: Permit pg.79]

"Partial Permit Incinerator/combustion references

3. Addition of the following new units to be used temporarily for closure activities:

a. Surface impoundments

b. **Incinerators "** [72] [emphasis added]

d. That are residues from wastewater treatment or incineration, provided that disposal occurs in a unit that meets the minimum technological requirements stated in §268.5(h) (2), and provided further that the surface impoundment has previously received wastes of the same type **(for example, incinerator scrubber water).** This modification is not applicable to dioxin-containing wastes (F020, 021, 022, 023, 026, 027, and 028)." [emphasis added]
[Volume 14 INTEC Liquid Waste Management System Appendix I Section D]

"3. Modification of an **incinerator**, boiler, or industrial furnace unit by changing the internal size or geometry of the primary or **secondary combustion units**, by adding a primary or **secondary combustion** unit, by substantially changing the design of any component used to remove HCl/Cl2, metals, or particulate from the **combustion gases**, or by changing other **features of the incinerator**, boiler, or industrial furnace that could affect its capability to meet the regulatory performance standards. The Director will require a new trial burn to substantiate compliance with the regulatory performance standards unless this demonstration can be made through other means.

4. **Modification of an incinerator**, boiler, or industrial furnace unit in a manner that would not likely affect the capability of the unit to meet the regulatory performance standards but which would change the operating conditions

---

[68] INL: ILWMS Partial Permit Number: ID4890008952 Effective Date: November 20, 2014 Revision Date November 27, 2017 MODULE VI, Page 78 of 86]. Hereinafter Vol.14- ILWMS HWMA/RCRA Permit Class 3 PMR/RTA February 2019.

[69] Class 3 PMR/RTA February 2019, Permit Pg. 7

[70] Volume 14 Revision Date: November 27, 2017, pg. 38

[71] Volume 14 Revision Date: November 27, 2017, pg.79

[72] Volume 14 INTEC Liquid Waste Management System Appendix I Section D]

or monitoring requirements specified in the permit. The Director may require a new trial burn to demonstrate compliance with the regulatory performance standards
5. Operating requirements:
a. Modification of the limits specified in the permit for minimum or **maximum combustion gas temperature**, minimum combustion gas residence time, oxygen concentration in the secondary combustion chamber, flue gas carbon monoxide and hydrocarbon concentration, maximum temperature at the inlet to the particulate matter emission control system, or operating parameters for the air pollution control system. The Director will require a new trial burn to substantiate compliance with the regulatory performance standards unless this demonstration can be made through other means." [emphasis added]

"L. **Incinerators,** Boilers, and Industrial Furnaces:
"3. Modification of an **incinerator**, boiler, or industrial furnace unit by changing the internal size or geometry of the primary or secondary combustion units, by adding a primary or secondary combustion unit, by substantially changing the design of any component used to remove HCl/Cl2, metals, or particulate from the **combustion gases**, or by changing other features of the **incinerator**, boiler, or industrial furnace that could affect its capability to meet the regulatory performance standards. The Director will require a **new trial burn to substantiate compliance** with the regulatory performance standards unless this demonstration can be made through other means." [emphasis added]
"4. Modification of an **incinerator,** boiler, or industrial furnace unit in a manner that would not likely affect the capability of the unit to meet the regulatory performance standards but which would change the operating conditions or monitoring requirements specified in the permit.
"5. Operating requirements:
a. Modification of the limits specified in the permit for minimum or maximum **combustion gas temperature**, minimum combustion gas residence time, oxygen concentration in the secondary combustion chamber, flue gas carbon monoxide and hydrocarbon concentration, maximum temperature at the inlet to the particulate matter emission control system, or operating parameters for the air pollution control system. **The Director will require a new trial burn to substantiate compliance with the regulatory performance standards unless this demonstration can be made through other means trial burn to demonstrate compliance with the regulatory performance standards**." [emphasis added]

"6. **Burning different wastes**:
a. If the waste contains a POHC that is more difficult to burn than authorized by the permit or if burning of the waste requires compliance with different regulatory performance standards than specified in the permit. The Director will require a new trial burn to substantiate compliance with the regulatory performance standards unless this demonstration can be made through other means.
b. If the waste does not contain a POHC that is more **difficult to burn** than authorized by the permit and if burning of the waste does not require compliance with different regulatory performance standards than specified in the permit."

"9. Technology changes needed to meet standards under 40 CFR part 63 (Subpart EEE—National Emission Standards for Hazardous Air Pollutants From **Hazardous Waste Combustors**), provided the procedures of §270.42(j) are followed.
10. Changes to RCRA permit provisions needed to support **transition to 40 CFR part 63 (Subpart EEE—National Emission Standards for Hazardous Air Pollutants From Hazardous Waste Combustors), provided the procedures of §270.42(k) are followed."** [73] [emphasis added]
[Volume 14 INTEC Liquid Waste Management System Appendix I Section D]

"40 CFR 270.42 Permit modification at the request of the permittee.
(j) **Combustion facility changes to meet part 63 MACT standards**. The following procedures apply to hazardous waste combustion facility permit modifications requested under appendix I of this section, section L(9).
(A) Any Class 2 modification meeting the criteria in paragraph (e) (3) (ii) of this section, and
(B) Any Class 3 modification that meets the criteria in paragraph (3) (ii) (A) or (B) of this section; or that meets the criteria in paragraphs (3) (ii) (C) through (E) of this section and provides improved management or treatment of a

[73] Volume 14 INTEC Liquid Waste Management System Appendix I Section D

hazardous waste already listed in the facility permit." [74] [emphasis added]
(C) Sufficient information to ensure compliance with 40 CFR part 264 standards. [75]
[Source: INL HWMA/RCRA INTEC Liquid Waste Management System Permit Attachment 1, Section D, Process Information Volume 14 Effective Revision Date: November 20, 2014, pg. 108]

The point EDI makes citing the above numerous references to "incinerators", "combustion facilities," "maximum combustion gas temperature," "Hazardous Waste Combustors" and "Combustion facility changes to meet [40 CFR] part 63 MACT standards" **in this IWTU Partial Permit** is to challenge DOE's claim that the IWTU is none of these types of operations and do not have to comply with the more stringent MACT emission standards. The temperatures disclosed above (exceeding 1,199 C) alone defy DOE's public claim. Even if no open flame is used, the temperatures alone will generate combustion, thus DNFSB concerns (cited below) about fire protection deficiencies.

"The Defense Nuclear Facilities Safety Board completed a review of the safety basis for Idaho National Laboratory's Integrated Waste Treatment Unit (IWTU) in October 2017. The Board's review team identified the following weaknesses in IWTU's safety basis:

• Several hazards are designated as standard industrial hazards and are screened from further analysis in IWTU's safety basis. As a result, IWTU's safety basis does not adequately analyze some events, such as a carbon dust explosion in the fuel storage silos, and oxygen displacement in the process areas. These types of events may require identification of safety-significant controls for protection of workers.
• IWTU's fire hazard analysis relies on the implementation of site-wide safety management programs to screen out hazards during the unmitigated analysis. This is inconsistent with the Department of Energy's documented requirements. Consequently, IWTU's safety basis does not analyze several possible accident events, such as a carbon dust fire in the additive storage room. A carbon dust fire could spread to the adjacent mechanical equipment area, potentially damaging the safety-significant components in that space." [76]

Section III. IWTU Tanks

Below "Table D-4 lists the tank numbers and descriptions, the approximate year operations will begin, materials of construction, and the design standards used for the tanks in the IWTU. The tanks are constructed to the current American Society of Mechanical Engineers (ASME) Section VIII standards of that time period. Table D-4 identifies which tanks were certified.

"Because the liquid waste solutions processed through the IWTU are highly acidic (primarily nitric acid), the tank materials of construction were selected on the basis of their ability to withstand corrosive attack by acidic nitrate solutions and acidic atmospheres in the IWTU operating temperature ranges. The materials of construction were evaluated by an independent professional engineer and were determined to be appropriate for the waste and conditions of service as noted in 1 n RCRA Design Assessment and Certification of the IWTU." [77]
[Source: INL HWMA/RCRA INTEC Liquid Waste Management System Permit Attachment 1, Section D, Process Information Volume 14 Revision Date: November 27, 2017pg52 -53]

"The system consists of the Process Equipment Waste Evaporator (PEWE) system, the Liquid Effluent Treatment and Disposal (LET&D) facility, the Evaporator Tank System (ETS), and the Integrated Waste Treatment Unit (IWTU). The system includes tanks and ancillary equipment in Buildings CPP-604, CPP-649, CPP-659, CPP-1618, CPP-1696, and associated valve boxes and junction boxes (JB) (C-30, C-32, C-37, C-38, C-40, A-7, B-1, B-2, B-4, B-5, B-9, B-10, B-11, D-4, D-5, D-8, JB-7, JB-8) at the INTEC. The equipment associated with these units is addressed separately within this permit. The PEWE system is discussed first, then the LET&D, the ETS, and finally the IWTU. The regulated tanks and ancillary equipment specific to the PEWE system are listed below:

• VES-WL-132, CPP-604 Evaporator Feed Sediment Tank (regulated under IDAPA as a storage/treatment tank)
• VES-WL-133, CPP-604 Evaporator Feed Collection Tank (regulated under IDAPA as a storage/treatment tank)

---

[74] Volume 14 INTEC Liquid Waste Management System Appendix I Section D]

[75] INL HWMA/RCRA INTEC Liquid Waste Management System Permit Attachment 1, Section D, Process Information Volume 14 Effective Revision Date: November 20, 2014, pg. 108]

[76] DNFSB letter 3/27/18 to James Richard Perry Secretary of Energy

[77] INL HWMA/RCRA INTEC Liquid Waste Management System Permit Attachment 1, Section D, Process Information Volume 14 Revision Date: November 27, 2017, pg52 -53.

- VES-WL-102, CPP-604 Surge Tank for VES-WL-133 (regulated under IDAPA as a storage/treatment tank)
- VES-WL-109, CPP-604 Evaporator Head Tank (regulated under IDAPA as a storage tank)
- EVAP-WL-129, CPP-604 Evaporator Unit, including VES-WL-129, VES-WL-130, HE-WL-307, and HE-WL-308 (regulated under IDAPA as a miscellaneous unit with treatment/storage tanks)
- VES-WL-134, CPP-604 Process Condensate Surge Tank (regulated under IDAPA as a storage tank)
- EVAP-WL-161, CPP-604 Evaporator Unit, including VES-WL-161, VES-WL-162, HE-WL-300, and HE-WL-301 (regulated under IDAPA as a miscellaneous unit with treatment/storage tanks)]

[Source: Volume 14 INTEC Liquid Waste Management System Attachment 1, Section D Process Information Revision Date: November 27, 2017, pg., 1]

All LWMS tanks (except for two) listed below connected to IWTU Tank List on Attachment 1, Section page 53 have: **Note* (astrict): Not Stamped - Built to ASME Section VIII. No code stamp required. These qualification assumptions do not pass any legitimate test.**

Tank Number Description	Expected Start of Operation	Materials of Construction	Design Standard(s)
VES-SRC-131 Waste Feed Tank	201&2	Type 304L SS	ASME Section VIII Division 1*
VES-SRC-133 Sump Tank	201&2	Type 304L SS	ASME Section VIII Division l*
VES-SRC-134 Clarifier Tank	201&2	Type 304L SS	ASME Section VIII Division 2*
VES-SRC-140 Denitration and Mineralization Reformer	201&2	Haynes 556 Alloy	ASME Section VIII Division l*
VES-SRC-160 Carbon Reduction Reformer	201&2	Carbon Steel and High Alumina/Chrome Oxide Based Brick and Castable Refractory Lined	ASME Section VIII Division l*
VES-SRC-190 and -191 Product Receivers/Coolers	201&2	Type 316H SS	ASME Section VIII Division l*
TK-SRE-196 Fire Water Collection Tank	201&2	Carbon Steel (Double Wall)	*NIA*
TK-SRH-141 Condensate Collection Tank	201&2	Polypropylene	ASTM F2389-07El or D4101- 08

Table D-4. IWTU Tanks Note*: **Not Stamped - Built to ASME Section VIII. No code stamp required.**

[ALL BUT LAST 2 Tanks Listed HAVE * (astrict)**]** [Partial Permit pg.53]

Six of the above listed IWTU tanks cannot meet RCRA compliance because there is no stamp on the tank that shows "Built to ASME Section VIII" standards.

"Building CPP-1696 is equipped with its own dedicated building ventilation system. Ventilation is directed from areas of lower potential contamination, such as the intermediate zoned area for maintenance and truck bay and eventually to areas of higher potential contamination, such as the Process Cell. Building ventilation inlet air is filtered, as is the ventilation air entering the Process Cell and other shielded cells. The air from the shielded cells is then routed through the Building Ventilation HEPA Filters and ultimately combined with process offgas in the Air Mixing Box downstream of the Continuous Emissions Monitoring System and exhausted through the IWTU stack." [Source: Partial Permit pg. 54]

"Process Gas Filter

"The process gas from the DMR flows to the Process Gas Filter, F-SRC-153. The Process Gas Filter is comprised of sintered metal powder-type filter elements contained in a Haynes 556 vessel, provided to capture any DMR product fines carried over in the process gas. The filter elements were manufactured with a fuse installed. The fuse was designed to allow the isolation of individual filter elements if they fail by becoming permanently blinded. It was determined that these fuses were not necessary to be protective of human health and the environment and were removed. The Process Gas Filter operates at approximately 50º to 100°C below the DMR temperature and is constructed of appropriate high temperature alloy metals. [emphasis added]

"The Process Gas Filter is designed to remove 99 % of particles greater than 2.0 microns in size and includes a tube sheet comprised of bundles containing multiple filter elements that filter the process gas. [emphasis added]

"Each filter bundle is equipped with a ceramic fiber core gasket using a ring of material cut from a thick mat of the high temperature ceramic fibers which eliminates any seams in the core of the gaskets. The gaskets are soaked in a water dispersion of vermiculite (a magnesium-aluminum-silicate mineral) to form a strong, multi-layer film, to enhance the seal ability of the gasket. Each bundle can be remotely removed and replaced if filter change-out is needed. The individual filter bundles are secured to the tube sheet using three couplers that bolt the venturi plates to the tubesheet to prevent lifting and resultant material carryover. The inlet pressure and outlet pressure of the Process Gas Filter are monitored, and the differential pressure across the filter is calculated. Upon high differential pressure across the filter, the filter can be cleaned online using pulse cleaning with nitrogen. Nitrogen is pulsed sequentially through the filter bundles and removed filter cake particulates drop by gravity to the bottom cone of the filter vessel for collection. The pulse cleaning cycle may also be initiated by a timer or manually by the operator. The filtered solids are fluidized into the Process Gas Filter Transfer Eductor, JET-SRC-553." [78] [emphasis added]

The above discussion on the IWTU Process Gas shows an inadequate filtration and emission control system. DEQ's failure to force DOE to implement the requisite EPA classification of combustion/ incinerators facilities allows for these deficiencies. **The IWTW "Table VI-1. IWTU Automatic Waste Feed Cutoff TC-C-160-4 [Carbon Reduction Reformer] CRR average bed temperature >1100 C" [79] is a combustion/incinerator and "process vent" no matter DOE use of "steam reformer" label.**

"Process Vent" means any open-ended pipe or stack that is vented to the atmosphere either directly, through a vacuum-producing system, or through a tank (e.g., distillate receiver, condenser, bottoms receiver, surge control tank, separator tank, or hot well) associated with hazardous waste distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations. [80] [x.Pg10]

EDI continues to emphasize that the tank **solids** from the original INTEC reprocessing remain and should continue to be classified as high-level waste but are NOT by DOE or the ID DEQ. DOE now claims this waste is "waste-incidental-to-reprocessing" (WIR). [81]

---

[78] Volume 14, INTEC Liquid Waste Management System Attachment 1, Section D Process Information, Pg. 25.

[79] Volume 14 – ILWMS HWMA/RCRA Permit Class 3 PMR/RTA February 2019, pg 79.

[80] Volume 14 – ILWMS HWMA/RCRA Permit Class 3 PMR/RTA February 2019, pg. 10.

[81] DEPARTMENT OF ENERGY Office of Environmental Management Notice of Preferred Sodium Bearing Waste Treatment technology AGENCY: Office of Environmental Management, U.S. Department of Energy. ACTION: Notice of Preferred Sodium Bearing Waste Treatment Technology, Federal Register /Vol. 70, No. 148 /Wednesday, August 3, 2005 /Notices.

Table 7: INTEC Tank Radioactive Solids/Heels Transuranic Contents

INTEC SBW Tanks in-use	Curies (Ci/kg) [82]	Solids Quantity (kg) [83]	Sand-Pads cushion under tanks Ci	Total Curies [84]	Total nCi/g [85] [86]	No. Times Over Reg. Limit [87]
WM-187	0.03395	160,000	3,850	5,432	543.2	5
WM-188	0.028698	10,000	?	286.98	28,698	286
WM-189	?	20,000	?	?	?	?
WM-190 Empty *	?	?	?	?	?	?
Totals in-use		190,000	?	5,719	?	?
Totals in-use + Closed tbl. above Total All		190,000 3,815 193,815	3,850 3,850 7,700	5,719 7,700 12,424 25,843	?	?

Above Table Units: 1 kilo-gram (kg) = 1000 grams (g); 1 curie (ci) = 1 billion nano-curies (nCi)

* "Tank WM-190 is an emergency spare tank and has never been used to store waste. However, this tank was contaminated with a small volume of first-cycle extraction process waste when the waste passed inadvertently through a transfer valve. As noted previously, Tank WM-182 contains the largest amount of residual radioactivity of the cleaned tanks." "The inventories for each [of the 4] 30,000-gal tank vary from 36.2 to 36.7 Ci." [or total of ~148 Ci][pg.36]

Section IV. DNFSB Continues to Review the Integrated Waste Treatment Unit, As Design Modifications and Testing Continue [88]

The Defense Nuclear Facilities Safety Board (DNFSB) continues to review the Integrated Waste Treatment Unit (IWTU) that was slated to complete its mission in 2012. Another round of design modifications has required a permit modification from the Department of Energy's cleanup contractor, Fluor Idaho, to the Idaho Department of Environmental Quality. [89] There is expected to be another round of design modifications in a future permit modification request. The February 2019 round of design changes to the IWTU include:

"1. Replace Denitration Mineralization Reformer (DMR) Ring Header. Replace damaged ring header and fluidizing gas rails with Double Plenum design to allow better distribution of fluidizing gas.

---

[82] Ibid. Table 26, pg. 57; Table 28, pg. 61; Table 29, pg. 63.

[83] Ibid. Table 24, pg. 53 and pg. 54

[84] DOE/NE-10-11226, pg. 34 &37

[85] Unit conversion example: 0.028698 ci/kg X (nCi/g/1 billionth [1.0E-9]) X 1 kg/1000 = 28,698 nCi/g; or 0.028698 ci/kg X 1,000,000 (1.0E6) = 28,698 nCi/g; (1.0 E-9 is the same as 1.0 x $10^{-9)}$.

[86] Ci/g and nCi/g are concentration unit ratios for quantifying radioactivity per unit quantity.

[87] Transuranic (TRU) waste is radioactive waste that is not classified as high-level radioactive waste and that contains more than **100 nano-curies** (3700 Becquerel's) per gram of alpha-emitting transuranic isotopes with half-lives greater than 20 years. DOE previously classified these tanks as high-level waste but recently "reclassified" them as Sodium-Bearing Waste (SBW) incidental to reprocessing uranium reactor fuel with higher amounts of uranium-235 ("highly- enriched") to extract U-235 and Pu-239 for new reactor fuel and military purposes.

[88] See EDI April 2019 newsletter by Tami Thatcher: http://www.environmental-defense-institute.org/edipubs.html

[89] The Department of Energy's cleanup contractor, Fluor Idaho, has submitted a Class 3 Permit Modification request for the IWTU, EPA ID No. ID4890008952. "Class 3 Permit Modification Request Including a Request for Temporary Authorization for the Volume 14 HWMA/RCRA Storage and Treatment Permit for the Liquid Waste Management System at the Idaho Nuclear Technology and Engineering Center." The February 2019 permit request can be found at https://inldigitallibrary.inl.gov document ID4890008952 at https://inldigitallibrary.inl.gov/PRR/168374.pdf#search=ID4890008952%20%2A%202019

[Class 3 – 40 CFR 270.42(d) (2) (iii)]

2. Carbon Reduction Reformer (CRR) Nozzle N3 Modification. Allow the removal of damaged refractory and repair/replacement of the refractory in the CRR. [Class 2 – 40 CFR 270.42 Appendixes I, G.2.]
3. CRR refractory repair/replacement. Replace damaged castable refractory with hard faced refractory brick and castable refractory suitable for continued operation. [Class 2 – 40 CFR 270.42, Appendix I, G.2]
4. Lower maximum feed. Allow better control for treatment of wastes. [Class 2 – 40 CFR 270.42, Appendix I, L.4.]
5. Modify Offgas blower over-pressurization protection. Prevent accumulation of off-gas and condensation for stand-by blower. [Class 1 – 40 CFR 270.42, Appendix I, A.3]
6. Changes to the auger/grinder. Allow for continuous product transfer and removal of cementous material. [Class 1 – 40 CFR 270.42, Appendix I, A.3]
7. Replacement of DMR bed 3-point thermocouples with 6-point thermocouples. Allows for additional temperature data monitoring in the DMR. [Class 1 – 40 CFR 270.42 Appendix I, A.3]
8. Addition of DMR nitrogen neck purge. Allow increased fluidization. [Class 2 - 40 CFR 270.42, Appendix I, L.4]
9. DMR drain line purge. Allow increased fluidization. [Class 2 – 40 CFR 270.42, Appendix I, L.4]
10. CRR Nozzle N2 drain enhancement. Allow for effective bed removal in the vessel during radiological operations. [Class 1 – 40 CFR 270.42 Appendix I, A.3].
11. Sample System Part Modifications. Allow increased functionality of the sample system. [Class 1 – 40 CFR 270.42, Appendix I, A.3]
12. Addition of Carbon Dioxide to the Fluidizing Gas. Reduces the buildup of wall scale and cementous product deposits in the DMR." [Class 2 – 40 CFR 270.42, Appendix I, L.4.]

After additional non-radioactive "simulant" testing is completed, initial IWTU emissions testing will be conducted using the HLW sodium-bearing liquid waste. The liquid waste will require some preparation before being pumped to the IWTU. And stratification of the waste could mean that deeper layers of the waste could contain more transuranic radionuclides, not represented by initial emission testing. The current plans will assume that initial emissions will be representative for all operations as minimal radiological emissions monitoring appears to be conducted when the unit is operational.

The future initial emissions testing and data are slated to require another RCRA hazardous waste treatment permit modification, with public meetings and comment period. To get an idea of the safety issues involved with operating the IWTU, we provide a description written by the Defense Nuclear Facility Safety Board (DNFSB) in 2007 and more recent DNFSB reviews.

Back in January 24, 2007, the DNFSB wrote a letter [90] describing that "The Integrated Waste Treatment Unit (IWTU) will convert approximately 900,000 gallons of acidic, liquid sodium bearing waste to a solid carbonate or mineralized product for permanent disposal at the Waste Isolation Pilot Plant or an off-site geologic repository. The sodium bearing waste is currently stored in three tanks at the Idaho Nuclear Technology and Engineering Center (INTEC) and will be treated using steam reforming technology. The IWTU will also stabilize liquid wastes generated from continued cleanup of the INTEC area. Portions of the facility's structure may have a future mission to support the recovery of High-Level-Waste Calcine for off-site disposal, and are thus being designed to more rigorous structural requirements."

"The safety strategy relies on confinement of hazardous materials, radiation shielding, and accident prevention during steam reforming and waste product handling operations. **Significant hazards include mercury release from a charcoal absorber bed fire, hydrogen deflagration in process equipment, and confinement boundary failure resulting in release during a seismic event. Engineered and administrative controls will prevent and mitigate worker consequences from these and other events identified in safety basis document. Controls credited as safety significant for the IWTU include the following:**

[90] Defense Nuclear Facilities Safety Board letter to the Department of Energy, January 24, 2007 at https://www.dnfsb.gov/sites/default/files/document/509/ltr_2007124_2127.pdf

- rapid shutdown system (including its uninterruptible power supply;
- off-gas cooling system;
- radiation shielding (process cell, carbon reduction reformer cell, packaging station
- cell, storage vaults, vault loading area, 72B transport cask and adapter, and remote-handled
- transuranic (RH-TRU) waste canister transfer bell); and
- confinement (storage vaults, process cell, carbon reduction reformer cell, packaging
- station cell, RH-TRU canister, and denitration and mineralization reformer and
- carbon reduction reformer in-cell carbon addition lines)."

"To provide additional worker protection, all components providing primary confinement of the waste during operations with the exception of the RH-TRU canister are credited as defense-in-depth. The building ventilation system is also credited as defense-in-depth, and a Technical Safety Requirement level control will require cessation of steam reforming operations if the system becomes inoperable."

"A one-tenth scale pilot plant was constructed at Hazen Research, Inc. to demonstrate integrated operation of the IWTU process, confirm process chemistry and mass and energy balance calculations, and demonstrate acceptability of the waste product and off-gas emissions. The first stage of testing produced a carbonate waste form. Valuable lessons learned were derived from this effort including, among others, the acceptability of sintered metal in the high temperature process gas filter and the control set to prevent and mitigate a charcoal adsorber bed fire. Testing for the mineralized waste form was completed at the end of 2006." [91]

But despite the testing at the Hazen facility completed in 2006, the IWTU was plagued with problems, including a serious over pressurization during testing on June 16, 2012. [92]

Additional testing at the Hazen facility had to be conducted beginning in 2016 after Fluor took over the cleanup contract because of the many malfunctions and clogging up of the IWTU during "simulant" runs.

The Department of Energy's own inspector general found that the DOE had **prematurely** declared the IWTU to have completed construction and DOE had used faulty rationale to accept the results of the early tests at the Hazen facility. [93] The series of tests and repairs since missing the 2012 Idaho Settlement Agreement milestone resulted in costs termed operational costs exceeding $181 million in

---

[91] Ibid. DNFSB

[92] Environmental Defense Institute August 2012 newsletter article by Chuck Broscious "INL's Highly Radioactive Liquid Waste Treatment Plant Having Major Startup Problems," at http://environmental-defense-institute.org/publications/News.12.Aug.Final..pdf

[93] Department of Energy's Inspector General 2016 report: "Management of the Startup of the Sodium-Bearing Waste Treatment Facility" at http://energy.gov/ig/downloads/audit-report-doe-oig-16-09 Read about the faulty rationale to accept the results of two small scale tests: "The testing at Hazen Research Inc., which was used to help form the basis for the testing at the SBWTF [IWTU], was only a one-tenth scale prototype facility, and the testing consisted of only two test runs, one of which was unsuccessful. In addition, there were significant differences between the two facilities. For example, the primary system that transforms the waste at Hazen did not have the same internal components due to scale limitations. Also, the safety standards used during the pilot plant testing were much less stringent than those used at the SBWTF during operations, primarily because Hazen is a nonradiological, nonnuclear facility. While these differences were not considered significant during testing, Idaho officials told us they subsequently realized that the differences were significant enough that full scale or even half-scale pilot testing should have been conducted prior to startup."

2016, yet the facility had yet to process any waste. Redesign of the IWTU has cost as much as $50 million a month and been ongoing since 2016.

The DNFSB has noted the need to perform "Validation that the radionuclide assumptions in the safety basis are accurate, either through completion of sampling or through batch feed sampling requirements."

In addition, the DNFSB Board "encourages the IWTU project to consider incorporating limited, post-seismic monitoring capability into the IWTU control system as defense-in-depth assurance of safe shutdown. Currently, no seismically qualified system exists to verify safe shutdown following an earthquake."

Not only was the IWTU not designed for safety shutdown following a seismic event as recommended by the DNFSB in 2007, **it hasn't even been designed to assure safe configuration following an expected loss of electrical power event like the one that occurred February 20, 2019 which left workers scrambling to determine plant equipment status following power loss.**

The DNFSB wrote on August 3, 2018 that "After completion of the simulant runs, Fluor Idaho managers plan to conduct a facility outage, nominally scheduled to last six months, to perform required maintenance. Longer term plans include a readiness assessment prior to the start of radioactive, sodium-bearing liquid waste processing. Based on a projected efficiency rate of 30%, **processing the sodium-bearing waste could last as long as seven years**." With the IWTU not expected to begin operations before 2020, this would mean that it won't complete processing before 2026.

The DNFSB also wrote in 2018 about the inadequate fire hazards mitigations — that were justified based on the "short expected operational life" of the IWTU, which was originally to be less the two years. The DNFSB wrote that "IWTU's fire hazard analysis relies on the implementation of site-wide safety management programs to screen out hazards during the unmitigated analysis. This is inconsistent with the Department of Energy's documented requirements. Consequently, IWTU's safety basis does not analyze several possible accident events, such as a carbon dust fire in the additive storage room. A carbon dust fire could spread to the adjacent mechanical equipment area, potentially damaging the safety significant components in that space. IWTU has implemented safety management programs and non-credited safety controls that are intended to address these potential hazards within the short expected operational life of the facility but has not sufficiently documented the hazards and the controls in the safety basis. Such documentation should be completed regardless of the expected operational life of a facility."

The Department of Energy continues to set the trap for serious safety problems and accidents at the IWTU, as well as for unmonitored and potentially excessive emissions, both chemical and radionuclide, should it ever operate. The DOE also formally made the "assumption" that offsite disposal for the treated sodium-bearing waste would be found but this is no closer to reality than it was 20 years ago. See some of DOE's formal *ass*umptions for the IWTU project in this 2011 document. [94]

The Department of Energy abandoned the calcine units that burned kerosene that operated at 500 Celsius (932 Fahrenheit) because they could not meet federal clean air Maximum Achievable Control Technology (MACT) standards, but then decided not to meet those requirements with the IWTU because although it will burn coal and operate at temperatures near 1000 Celsius (1832 Fahrenheit). [95] [96]

---

[94] Department of Energy, Idaho Closure Project, "Integrated Waste Treatment Unit GFSI Risk Management Plan," DOE/ID-11270, June 21, 2007, OSTI identifier 909857, at https://www.osti.gov/biblio/909857

[95] Code of Federal Regulations (CFR), National Emission Standards for Hazardous Air Pollutants, Maximum Achievable Control Technology (MACT) Standards for Major Sources 40 CFR 63.40 through 63.44

[96] Environmental Defense Institute and Keep Yellowstone Nuclear Free letter to U.S. Environmental Protection Agency, March 13, 2007 at http://www.environmental-defense-institute.org/publications/EDI.Pet.%20EPA%20IG.Fin3.13.07.pdf

Excuses have been verbalized such as: "it isn't an incinerator and has no open flame." There are claims that the IWTU will meet MACT standards, so why not *require* the IWTU to meet MACT standards?

The Idaho DEQ addresses radionuclide emissions via Permit to Construct licenses which the Idaho DEQ does not make public and does not enforce, based on DEQ's failure to investigate the unplanned disposal of radionuclides at the Advanced Test Reactor Complex radioactive waste pond. Radionuclide emissions via federal National Emission Standards for Hazardous Air Pollutants (NESHAPS) [97] means unmonitored guessimated and not-publicly-available rationale for radionuclide estimates are used to make estimated radiological dose estimates all while ignoring the buildup of long-lived radionuclides in the air, soil and water.

IDEQ's Brian R. Monson replied to EDI's comments as follows:

> **EDI Comment**:
> *"IDEQ states, 'The proposed IWTU is not considered a combustion technology. Although steam reforming is subject to the Maximum Achievable Co11trol Tech11ology (MA CT) standards for hazardous waste combustion, the IWTU is designed to meet these standards." This is a clear obfuscation of Clean Air Act regulatory enforcement. IDEQ is required by law to state that the IWTU SHALL meet MACT emission standards.'*
> *The Integrated Waste Treatment Unit (IWTU) 'steam reformer' meets the regulatory definition of a 'combustion device [40 CFR § 63.111]'"*
> **DEQ Response**:
> "The 40 CPR§ 63.111 definition cited applies to MACT Requirements for Synthetic Organic Chemical Manufacturing. These requirements are not applicable operations at the Idaho National Laboratory. DEQ determined that the Integrated Waste Treatment Unit does not meet the definition of a hazardous waste combustor subject to the Hazardous Waste Combustion Maximum Achievable Control Technology (MACT) standards at 40 CPR Part 63 Subpart BEE. This determination relied on the following:
> 1. The IWTU does not use a controlled flame in that there is no direct fired unit in either of the two treatment chambers (RCRA Online #14266); and,
> 2. The primary function of the IWTU is not destruction of organic wastes but drying of the acidic solution with subsequent control of the nitrogen oxides and other gases generated in the drying process. The hazardous waste combustor emission standards were considered when the draft permit was prepared. Predicted emissions have been determined to be protective of human health and the environment as required at IDAPA 58.01.05.008 [40 CFR Part 264 Subpart X]. The protectiveness standard for the INTEC units will be revisited when actual IWTU emissions are measured during the performance test."
> **EDI Comment:**
> *"'Process Vent' is a broad regulatory category for a major source a hazardous air pollutants that must comply with more restrictive EPA emission regulations. DOE has been and continues to side-step compliance with these emission regulations with bogus assertions that their hazardous and radioactive waste treatment operations are not Process Vents."*
> **DEQ Response**
> *"The commenter asserts that the Process Equipment Waste Evaporator (PEWE), the Liquid Waste Treatment and Disposal facility (LET&D), the Evaporator Treatment System (ETS), and Integrated Waste Treatment Unit (IWTU) emissions should all be subject to regulation under the process vent standards."*
> **DEQ Response:**
> "The IWTU is not subject to the Process Vent requirements for the following reasons:
> 1. The IWTU stack does not meet the definition of a vent [see IDAPA 58.01.05.008 (40 CFR § 264.1031)] in that the off-gas is processed through a pollution control system not simply discharged to the atmosphere;
> 2. The IWTU is not identified as a type of unit subject to regulation as a process vent; and,
> 3. The volatile organic concentration of the waste being treated appears to be below the level subject to regulation.
> Thus the IWTU is not subject to the process vent regulation. Similarly the PEWE and ETS off gas streams are not vented but discharged through the INTEC Main Stack after treatment. DEQ does apply the Process Vent standard to the Liquid Effluent and Treatment Disposal (LET &D) unit because: the volatile organic

[97] https://www.epa.gov/compliance/national-emission-standards-hazardous-air-pollutants-compliance-monitoring

concentration of the feed likely is above the level subject to regulation; the LET &D is a fractional distillation unit; and the emissions are vented to the main stack without passing through a pollution control device for volatile organic compounds.
The Process Vent Standards have been properly applied to the INTEC Liquid Waste Management Treatment Units.
No changes were made to the permit as a result of this comment."

EDI Comment:

"The above DOE Permit does not implement new: "EPA (2005) recommendations that organics and metal emission limits be increased by factors of 2.8 and 1.45 respectively, to account for potential increases in emissions due to process upset conditions." Also, there is no apparent cumulative hazardous/radioactive emissions data for all the INTEC operations using the same Main Stack, other co- located stacks, and the new IWTU stack as required in the regulations."

DEQ Response:

"The risk analysis presented in the Draft Permit assumes emissions from the concurrent operation of the PEWE, LET&D, ETS and IWTU. While this risk analysis does not include upset factors, the predicted cumulative risk to human health and the environment is several orders of magnitude below levels of concern. DEQ maintains the risk analysis adequately addresses the protectiveness issue with respect to hazardous constituents. As noted earlier, radionuclide emissions are beyond the scope of this Hazardous Waste Management Act Permit.
No changes were made to the permit as a result of this comment."

EDI Comment:

DOE apparently plans to continue using ~ 155 tanks listed in previous permits; some compliant, some non-compliant tanks, ancillary service lines and equipment. DOE's 4114 Permit re-application only lists about ~64 tanks and fails to provide crucial information about each tank. Apparently, all of the functioning tanks are not listed in the Permit."

DEQ Response:

"The renewal permit only addresses those tanks listed in the permit that are within the scope of the INTEC LWMS operational boundaries. The list provided by the commenter includes: more than twenty tanks that have been HWMA/RCRA closed; tanks/equipment addressed in other INTEC Partial HWMA Permits; secondary containment sumps for permitted tanks (see IDAPA 58.01.05.008 [40 CFR § 264.190(b)]); tanks not subject to HWMA regulation; and, tanks beyond the INTEC Liquid Waste Management System boundaries."
No changes were made to the permit as a result of this comment."

EDI Comment:

"Twelve of the tanks (listed in the Permit) date back to 1951, and nine tanks date back to the 1970s and 1980s, long beyond their 20-year design life. An additional18 tanks have no "certification stamp." That is a total of 39 tanks that are non-compliant. The ASME design standards for the other tanks are only relevant if the tanks have not already exceeded their design life. DOE must stipulate the ASME design life and age .for each of the tanks listed in the PMR along with the anticipated years of future operational use.
Twelve of the CPP-641listed tanks date back to the early 1950s, 45 years beyond their 20-year design life. Nine of the above tanks put into service in the 1960s and 1980s are also long beyond their design life. An additional four tanks have no certification stamp.
So a total of 26 tanks (just in CPP-641) are not in compliance. The ASME design standards for the other tanks are only relevant if the tanks have not exceeded their design life. DOE must provide documentation 011 each tanks design life and age to validate their continued use through the operational life of the ILWMS.
"The Permit tank table states: "No code stamp required??" The code stamp is a RCRA requirement and is the only legitimate verification that the tank does in fact meet the standard. Again, these tanks are likely beyond their 20-year design life. Therefore, DOE must provide documentation on each tank design life.
Again, the ASME design standards for the tanks are only relevant the tanks have not exceeded their design life and future operational planed use. DOE must provide documentation on each tanks design life to validate their continued use through the operational life of the IL WMS."

DEQ Response:

"The commenter appears to assume that an older tank must be unsound. IDAPA 58.01.05.008 [40 CFR § 264.191] requires that a professional engineer conduct an assessment of the existing tank system certifying that

the tank is not leaking and is not unfit for use. The regulation goes on to say this assessment must be kept on file at the facility. This regulation does not address ASME design life.
No changes were made to the permit as a result of this comment."

EDI Comment:

"RCRA secondary containment requirement in tank vaults is compromised by DOE's use of 'gerryrigged' Hypalon liners with dubious joint sealants that are not compliant or certified for waste contained in tanks.

"ILWMS 'Bottoms Tanks' do not meet required secondary containment under RCRA. DOE's Permit states: "The secondary containment is constructed of concrete floor lined with a Hypalon® membrane (registered trademark of DuPont), which extends three feet up the walls. All seams in the secondary containment are heat-welded or adhesive 14 bonded to avoid any cracks or gaps. The membrane is sealed around the tank saddles by silicone rubber 15 sealant that is capable of withstanding the expected waste solutions for extended periods of time. "

The above DOE disclosure of use non-certified "silicone sealant" that is "capable of withstanding the expected waste" for some vague undocumented "extended period of time" is grounds for denial of the Permit under 40 CFR § 270.42 because it does meet regulatory requirements for secondary containment."

DEQ Response:

"The commenter speculates that the Hypalon lined vault is non-compliant because it combines a Hypalon liner and "dubious joint sealants" that are not certified for the waste in the tank. The regulations at IDAPA 58.01.05.008 [40 CFR § 264.193] require that the secondary containment be designed, installed and operated to prevent any migration of wastes or accumulated liquid out of the system ... and that leaks can be detected within 24 hours. The Permit requires liquids be removed from a secondary containment system to the extent practicable within 24 hours of detection. Thus, if the silicone sealant is capable of withstanding the waste for an extended period of time and the waste must be removed within 48 hours (24 hours to detect the liquid in the secondary system and another 24 hours to remove it), DEQ concluded the containment is compliant."

EDI Comment:

"Extensive use of old non-compliant "drip troughs" in ancillary service lines instead of the required welded stainless steel secondary containment with continuous monitoring, are grounds for denying the Permit under 40 CFR § 270.42.

"DOE's Permit acknowledges secondary containment in waste service piping: Concrete-embedded transfer lines have been identified at the IL WMS."Drip troughs are located beneath process transfer lines within CPP-604, CPP-605, and CPP-1618. A drip trough also extends below the pipe bridge that spans from CPF-605 to the LET&D facility. The troughs are designed to collect liquid (e.g., recovered nitric acid in the event of a leak from the process transfer lines. These drip troughs are sloped and drain to collection bottles located within each system. The troughs located within the LET&D facility are not equipped with leak detection devices. Therefore, LET&D collection bottles are inspected daily for the presence of liquid when the fractionators are operating. These inspections are noted on Form INTEC-4055, which is included in Appendix F-1. All drip troughs located in CPP-604, CPP-605, and the pipe bridge are equipped with leak detection cables that are continuously monitored by the DCS.

"This is a violation of compliance with 40 CFR § 264.193(f) that requires monitored leak collection and welded stainless steel secondary containment. Although DOE claims its intent to upgrade or reroute these service lines, there is no apparent confirmation that all of these upgrades has occurred."

DEQ Response:

"IDAPA 58.01.05.008 [40 CFR § 264.193(f)] does not require welded stainless steel secondary containment only containment that will prevent a release to the environment and be detected within 24 hours. The drip troughs, when combined with permit required inspections, meet these criteria and are not grounds to deny the entire permit." [98]

---

[98] Brian R. Monson, Hazardous Waste Program Manager Waste Management and Remediation Division, RE: Final Decision to Issue the Renewal Partial Permit for HWMA Storage and Treatment for the Liquid Waste Management System at the Idaho Nuclear Technology and Engineering Center on the Idaho National Laboratory (INL, EPA ID No. ID4890008952) October 21, 2014, letter to Chuck Broscious.

Section V. IWTU DOE Operations Summary Excerpts

"Waste Treatment Progress: Progress continues in the effort to resume start-up activities for the Integrated Waste Treatment Unit, after the "pressure event" halted start-up activities last summer. The IWTU is designed to treat the remaining 900,000 gallons of liquid waste stored at the Idaho Nuclear Technology and Engineering Center tank farm. With the completion of the IWTU main process piping flush, the project can now start reassembling the process gas filter, off gas filter and the carbon reduction reformer. Restart activities are anticipated to resume this summer." [99]

"Dec. 17, 2013: An investigation was initiated into the adequacy of controls for relief valves and a rupture disk at the Integrated Waste Treatment Unit (IWTU). If the valves are not properly controlled, pressure could increase downstream of the rupture disks during process heat-up. This increase could cause a condition where the rupture disks would not rupture at the required pressure to protect the process off-gas system. IWTU operations have been shut down and will not resume until the necessary changes have been made to the facility or procedures." (EM-ID—CWI-IWTU-2012-0013). [100]

"June 19, 2012: Operators at the Integrated Waste Treatment Unit were performing start-up testing when an unexpected pressure transient caused a loss of vacuum in the Carbon Reduction Reformer vessel, activating the Rapid Shutdown System. All applicable emergency action procedures were followed, and a plant shutdown was initiated. A team has been formed to evaluate the cause of the incident and recommend corrective actions." (EM-ID—CWI-IWTU-2012-0008). [101]

"July 17, 2012: A potential inadequate safety analysis was declared as part of the investigation into the pressure event that occurred during start-up of the Integrated Waste Treatment Facility. It was determined that the potential for "blinding" filter systems in the facility with unburned charcoal had not been adequately analyzed in the current safety documents. The facility was shut down after the June 16 pressure event, and an investigative team was commissioned to determine the root causes of the event and how to correct them." (EM-ID—CWI-IWTU-2012-0009). [102]

"Waste Treatment: Startup testing was suspended on June 16, 2012, at the Integrated Waste Treatment Unit (IWTU), which is designed to treat about 900,000 gallons of liquid radioactive waste stored at the Idaho Nuclear Technology and Engineering Center. Testing was suspended and plant heat-up was terminated to allow detailed evaluation of the process temperature, pressure and flow excursion observed on June 16. Facility startup testing has been ongoing for the past month, evaluating system and component operation and response during operating conditions. Radioactive waste has not been introduced into the facility, pending successful completion of startup testing." [103] [emphasis added]

---

[99] DOE-ID Operations Summary -13 4-1; For the Period Feb. 12 to Feb. 25, 2013
[100] DOE-ID Operations Summary 13.01; For the Period Dec. 11, 2012-Jan. 2, 2013
[101] DOE-ID Operations Summary; For the Period June 19 to July 12, 2012
[102] DOE-ID Operations Summary; For the Period July 13 to Aug. 2, 2012
[103] DOE-ID Operations Summary; For the Period June 5 to June 18, 2012