# Environmental Defense Institute

**News on Environmental Health and Safety Issues**

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## Consent-Based Siting Meeting to be Held in Boise July 14

The Department of Energy has been hosting a series of public meetings around the country this year to receive input for the design of a consent-based siting process for spent nuclear fuel and high level waste. [1] Public comment at meetings or in writing is requested about what considerations are important when designing a fair and effective process for consent-based siting. The DOE is considering siting of a range of nuclear waste facilities, each serving a specific role, to address the challenges facing the U.S. These nuclear waste facilities could include:

- A pilot interim storage facility with limited capacity capable of accepting used nuclear fuel and high-level radioactive waste and initially focused on serving shut-down reactor sites; [*A "pilot" facility may be a sneak-around for avoiding the requirement in the Idaho Settlement Agreement for Naval spent nuclear fuel to be first in line to be sent to an interim facility.*]
- A larger, consolidated interim storage facility, potentially co-located with the pilot facility and/or with a geologic repository, that provides the needed flexibility in the waste management system and allows for important near-term progress in implementing the federal commitment; [*Often the temporary interim storage is simply called "consolidated" storage because it sounds like less of the temporary, kick-the-can-down-the-road band aide fix.*]
- Deep borehole disposal, which could be an option for disposal of smaller and more compact waste forms currently stored at Department of Energy sites; [*North Dakota has forbidden the Department of Energy from even conducting research in the state.*]
- A permanent geologic repository for the disposal of defense high-level waste and, potentially, some DOE-managed spent nuclear fuel, which would be generally less radioactive, cooler, and easier to handle, enabling a simpler design and earlier availability; [*DOE is hoping to put defense high-level waste and Naval SNF at WIPP, but isn't saying so openly just yet.*] and
- A permanent geologic repository for the disposal of commercial spent nuclear fuel. *[Let's keep pretending that we're going to find suitable geologic repository and a community that wants to sacrifice the land and water forever. Let's keep pretending that the geological predictions of radionuclide migration are realistic and protective of health.*

[1] See https://www.federalregister.gov/articles/2015/12/23/2015-32346/invitation-for-public-comment-to-inform-the-design-of-a-consent-based-siting-process-for-nuclear and http://www.energy.gov/ne/consent-based-siting

*And let's keep pretending that transportation of this material is safe – when we can't even keep trains from having several oil fire accidents far more severe that spent nuclear fuel casks can withstand. And the DOE, by all means, wants to avoid putting any limitations on the additional amount of spent nuclear fuel we generate.]*

See transcripts of past seven meetings. [2] The remaining two public meetings will be in:

- **Boise, ID** on July 14, 2016 at Boise Centre. Please register here to attend the Boise meeting in person or view the event online. To view a live webcast of the meeting, please click here.
- **Minneapolis, MN** on July 21, 2016 at the Hilton Minneapolis. Please register here to attend the Minneapolis meeting in person or view the event online. To view a live webcast of the meeting, please click here.

***DOE has extended the public comment period to July 31, 2016,*** *Email: Responses may be provided by email to consentbasedsiting@hq.doe.gov. Please include "Response to IPC" [Invitation for Public Comment] in the subject line.*

# Tetrachloroethylene Found in Aquifer South of US Highway 20 Being Investigated by USGS, IDEQ and ICP

The Idaho Falls Post Register reported that chemical degreaser tetrachloroethylene, also known as PCE, was found in the aquifer. [3] The Idaho National Laboratory cleanup contractor found the chemical in the well last November and also in March. The US Geological Survey, Idaho Department of Environmental Quality and Idaho Cleanup Project now operated by Fluor Idaho are investigating.

The well was said to be 1100 feet deep but the article did not identify the well. The depth of USGS wells can be found on the USGS mapper website or in USGS reports.[4] Two wells south of the INL burial ground, the Radioactive Waste Management Complex (RWMC), are over 1000 ft deep are USGS 132 and 135. Several wells on the southern boundary of the INL are USGS over 1000 ft deep include USGS 103, 105 and 108. The EBR-1 and Middle-2051 wells are also

[2] Meeting transcripts are provided at http://www.energy.gov/ne/consent-based-siting. For Denver's meeting see transcripts, including the speech given by Don Hancock, Southwest Research Information Center on p. 12 of the meeting transcript for Denver at http://www.energy.gov/sites/prod/files/2016/06/f32/Consolidated%20Meeting%20Denver%20Verbatim%20Transcript_Final.pdf

[3] Reporter Luke Ramseth, *The Idaho Falls Post Register*, "Agencies look to solve INL groundwater mystery," June 9, 2016.

[4] US Geological Survey website link: http://id.water.usgs.gov/projects/INL and INL bibliography at http://id.water.usgs.gov/INL/Pubs/INL_Bibliography.pdf . Select individual wells at the USGS mapper at http://maps.waterdata.usgs.gov/mapper/index.html **US Geological Survey Mapper Data**: See well data at http://maps.waterdata.usgs.gov/mapper/index.html.

over 1000 ft deep. I was able to confirm with Idaho DEQ that Middle-2051 is the well found to have the unexpected tetrachloroethylene.

A 1995 environmental report shows the RWMC production well (used for drinking water) having elevated tetrachloroethylene and a 1987 report [5] shows a perched water well at RWMC having 22 times the federal drinking water level. Before 1970, an estimated 88,400 gallons of organic chemicals were buried at RWMC including carbon tetrachloride, trichloroethylene, tetrachloroethylene, toluene, benzene, and 1,1,1-trichloroethane. But the Middle-2051 well is upgradient of RWMC.

A 2003 report states that tetrachloroethylene was identified as one of several chemical contaminants of concern disposed of in the aquifer at Test Area North (TAN). [6] A 1989 report [7] shows the TAN area having numerous wells contaminated with tetrachloroethylene, some over 12 times the federal drinking water standard of 5 microgram/Liter. While the TAN wells are north of Middle-2051, contamination from the TAN wells would not be expected to fan out this far west and should have been detected in other wells if it had.

A 1991 environmental report shows one well north of Middle-2051 having tetrachloroethylene, NRF-6, which is considerably north of Highway 20. [8]

More exhaustive search of INL reports, including CERCLA reports, could turn up other wells having tetrachloroethylene.

It is interesting to note that the 1991 report lists no carbon tetrachloride concentration above 2.3 mircograms/liter (ug/L). Yet values at RWMC wells are seen to exceed 10 ug/L these days yet the US Geological Survey told the INL Citizens Advisory Board in April that carbon tetrachloride levels in the aquifer are not increasing.

Chemical contamination in the aquifer has exceeded federal drinking water standards at many INL locations including the ATR Complex (formerly the Test Reactor Area) for hexavalent chromium, RWMC, and Test Area North (TAN). Chemical contamination in the aquifer is continuing to increase at the north end of the INL at TAN, and at RWMC as the five year CERCLA report acknowledges. [9]

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[5] Department of Energy, Idaho National Engineering Laboratory Site Environmental Report for Calendar Year 1987, DOE/ID-12082(87). Table B-9. Find it on https://ar.icp.doe.gov

[6] Department of Energy, Environmental Management under DOE-ID, INEEL Subregional Conceptual Model Report, INEEL/EXT—03-01169, Rev. 2, September 2003. p. 4-25.

[7] Department of Energy, Idaho National Engineering Laboratory Site Environmental Report for Calendar Year 1989, DOE/ID-12082(89). Table B-12. Find it on https://ar.icp.doe.gov

[8] Department of Energy, Idaho National Engineering Laboratory Site Environmental Report for Calendar Year 1991, DOE/ID-12082(91). Table B-16. (oddly missing from osti.gov/scitech)

[9] Department of Energy Idaho Operations Office, *Five-Year Review of CERCLA Response Actions at the Idaho National Laboratory Site,* Fiscal Years 2010-2014, DOE/ID-11513, December 2015.

# Hexavalent Chromium from INL Waste Water: Someone Should Tell Idaho DEQ It's not Healthy

The Idaho National Laboratory discharged an estimated 31,130 lbs of hexavalent chromium at the ATR Complex (formerly Test Reactor Area). [10] From as early as 1952 and ceasing in 1972, hexavalent chromium was disposed of by deep injection well to the aquifer and by percolation ponds. The plume of hexavalent chromium from the Test Reactor Area had spread south of the INL largely before chemical monitoring programs were put in place.

Early in the federal Environmental Protection Agency CERCLA investigation at INL, the government said that the hexavalent chromium was not a problem because it was not in the drinking water at TRA. Subsequent monitoring found hexavalent chromium in the drinking water at TRA despite the drinking water well being upgradient from the disposal. The US Geological Survey that had advised the Department of Energy in well placement, had not predicted that the high volume withdrawal of aquifer water at the production wells would suck contamination upgradient.

After seeing the adverse health effects of hexavalent chromium, also called chromium-6, the state of California has not only reduced the regulatory limit for hexavalent chromium from the EPA's 100 micrograms/liter to 10 micrograms/liter, California also created a public health goal to limit hexavalent chromium to 0.02 micrograms/liter. [11]

California regulators say that 0.02 ug/L yields a 1 in a million risk of cancer. So drinking water with hexavalent chromium at 100 ug/l is a cancer risk of 1 in 200, for a person drinking it for 70 years. It should be noted for perspective that 31,130 lb of hexavalent chromium admittedly dumped into the aquifer would require almost the entire aquifer to dilute to the public health goal of 0.02 ug/L. Of course, the plumes of hexavalent chromium are not diluted over the entire aquifer as they flow downgradient to the Magic Valley.[12] The EPA continues to investigate chromium but has not changed the federal MCL. [13]

Workers at INL drank elevated levels of hexavalent chromium at say 80 ug/L and were not told about it if it wasn't monitored or if it was below the federal drinking water standard. Prior to

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[10] Department of Energy, Environmental Management under DOE-ID, INEEL Subregional Conceptual Model Report, INEEL/EXT—03-01169, Rev. 2, September 2003. p. 3-5.

[11] California state resources board for chromium-6 (hexavalent chromium) at http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Chromium6.shtml

[12] The Snake River aquifer is roughly 2.44E+15 liters. Contamination is not diluted by the entire aquifer but spreads in unevenly diluted amounts of contamination as the contaminated waste water in the aquifer flows in fast paths and in slow paths downgradient, fanning out and spreading south, southeast and southwest from the source of contamination. For perspective only, to dilute 31,130 lb of hexavalent chromium to 0.02 micrograms/Liter would take 7E+14 Liters.

[13] American Water Worker Association, Chromium in Drinking Water: A Technical Information Primer at http://www.awwa.org/Portals/0/files/legreg/documents/UpdatedChromiumInDrinkingWaterSummaryFinal.pdf

1987 and more stringent drinking water laws, chemical monitoring at INL and elsewhere was not likely to be performed at Department of Energy federal facilities or state drinking water. [14]

The 1995 INL environmental report understates the chromium problem from the INL, saying INL "may have had a slight affect" on chromium concentrations. [15] Since 1987 when drinking water monitoring programs began to be put in place, the attitude in Idaho and at INL has been that any level below 100 micrograms/liter (or 0.1 milligrams/liter) was of no concern.

There is a natural form of chromium, chromium-III, that is healthy. But total chromium measurements at or near INL are typically found to be mainly hexavalent chromium, the unhealthy kind. Sample handling and timing can influence the accuracy of sampling. The Idaho DEQ drinking water data from total chromium often has an entry of zero despite USGS and more detailed IDEQ water monitoring reports that show elevated levels of total chromium.

Aquifer wells located near the Test Reactor Area had levels of hexavalent chromium in 1994 nearing 200 micrograms/liter and the downward trend indicates that the levels were higher in the past. [16] Wells located downgradient from INL have often been found to have from 4 to 14 ug/L and higher levels of total chromium when background levels should not exceed 3 ug/L. [17] A level of 20 micrograms/liter of hexavalent chromium for a 70 year lifetime would yield a 1 in a 1000 cancer risk, if no other contamination added to the risk. This is something that IDEQ and citizens downgradient of INL need to understand.

## New Bill for TSCA Reform May Limit State Authority, May Not Help in Timely Assessment of Cancer Clusters

Some people are optimistic about the chemical safety reform bill passed last week because it would require U.S. government to document and track cancer clusters around nation. The bill, called the

[14] The hexavalent chromium disposal was one of the reasons the INL was placed on the National Priority List for Superfund cleanup. In January 1988, the White House issued Executive Order #12580 which blocked the EPA and affected states from having the authority to determine pollution abatement projects for federal agencies under the Superfund Reauthorization Act of 1986. Under intense pressure from these states Congress passed, in 1991, the Federal Facilities Compliance Act (FFCA). This bill removes the federal government's sovereign immunity from compliance with state and federal environmental laws, and gives more state and EPA oversight authority to enforce laws at federal facilities.

[15] Department of Energy, Idaho National Engineering Laboratory Site Environmental Report for Calendar Year 1995, DOE/ID-12082(95). p. 5-9. https://www.osti.gov/scitech/servlets/purl/642692

[16] L. Flint Hall, Idaho Department of Environmental Quality, "Water Quality Trends for Surveillance Monitoring Sites," [Snake River Plain Aquifer, South of the Idaho National Laboratory] 2002. Figure 63 and others show chromium trends. https://www.deq.idaho.gov/inl-oversight/monitoring/reports/

[17] US Geological Survey, "Water-Quality Characteristics and Trends for Selected Sites and Near the Idaho National Laboratory, Idaho, 1949-2009," 2012-5169, DOE/ID-22219. p. 26 background levels range from 2 to 3 micrograms/liter and disposal of chromium-6 documented to have occurred at INL's ATR Complex, INTEC, Power Burst Facility and elevated levels are also found at Test Area North. But this report does not give adequate accounting of historical levels of contamination.

Frank R. Lautenberg Chemical Safety for the 21st Century Act, may not be the cause for optimism some people hope it will. [18] The bill may make it more difficult for states to enact more restrictions as the EPA investigates a contaminant. [19] Given Idaho's lack of involvement in considering health effects of chemical contaminants, that aspect will not make much difference here in Idaho where the state does not go beyond EPA requirements. It is unclear the extent that radiation-caused cancer clusters will be omitted from the requirement.

The bill (Sec. 30) amends the Public Health Service Act to "require the Department of Health and Human Services (HHS) to: (1) develop criteria for the designation of potential cancer clusters; and (2) develop, publish, and periodically update guidelines for investigating potential cancer clusters. While investigating these clusters, HHS may prioritize certain potential cancer clusters based on the availability of resources." [20]

Given the one to two decades HHS took to review a limited aspect of Nevada Weapons Testing, the iodine-131 released and entering our milk supply, and the 17 years HHS took to inadequately review the INEL Historical Dose Evaluation,[21] any optimism people have should be tempered. The HHS is obviously adverse to saying anything that the Department of Energy does not want to hear.

Why do I say this? The HHS concluded that despite the underestimation of several airborne radiological releases in the INEL Historical Dose Evaluation, that the doses were low — too low to have had an effect and therefore, no epidemiology effort was needed. [22] Yet, the cancer statistics for the areas near the Idaho National Laboratory have revealed elevated thyroid cancer risk, the highest in the nation. But the cause for this has not been investigated by the Idaho Cancer Registry.

My grandmother lived half way between the INL's chemical processing plant and Test Area North throughout the highest radiological releases from INL in the 1950s and 60s. I was told by an expert in radiological environmental contamination evaluations that my grandmother's death from thyroid cancer would not have been caused by INL releases because the doses were too low. The problem is that the dose estimates rely on estimates of wind patterns especially for

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[18] McClatchy News, "Law requiring feds to track cancer clusters headed to Obama's desk," June 8, 2016 http://www.mcclatchydc.com/news/politics-government/congress/article82427052.html

[19] See excerpt from Congressional record about Toxic Substances Control Act (TSCA) at http://blogs.edf.org/health/2016/01/05/senators-clear-the-air-on-early-preemption-under-the-senate-tsca-reform-bill/

[20] https://www.congress.gov/bill/114th-congress/house-bill/2576?q=%7B%22search%22%3A%5B%22%5C%22cancer+cluster%5C%22%22%5D%7D&resultIndex=1

[21] US Department of Energy Idaho Operations Office, "Idaho National Engineering Laboratory Historical Dose Evaluation," DOE-ID-12119, August 1991. See Table E-5 on p. E-36 for mystery milk and see Table C-21 for the public annual dose summary. Volumes 1 and 2 can be found at https://www.iaea.org/inis/inis-collection/index.html

[22] Center for Disease Control, CDC Task Order 5-2000-Final, Final Report RAC Report No. 3, by Risk Assessment Corporation, October 2002. https://www.cdc.gov/nceh/radiation/ineel/to5finalreport.pdf

early years when the largest releases occurred. Radiological monitoring records were destroyed **prior to CDC's review of the INEL Historical Dose Evaluation.** The INEL HDE assumed that no rain out of contaminants occurred, and the CDC review found that one of the largest acknowledged releases from Test Area North, Initial Engine Test 10 series, were underestimated by a factor of 10. Now knowing that thyroid cancers near INL are elevated still, I know that INL likely is responsible for my grandmother's health issues and early death of thyroid cancer at about age 60.

The Idaho Cancer Registry [23] review for 2009 to 2013 I wrote last month, I found that the age-adjusted overall cancer rates for Bonneville and Butte counties are similar and below the state average. **But, thyroid cancer is significantly higher than the state average, 28.8 and 27.7 for Butte and Bonneville county versus state rate of 15.9.** Bonneville and Butte county brain cancer and combined brain and central nervous system (CNS) cancer and leukemia rates nearing or slightly exceeding the state average using age-adjusted rates for Butte county's older population. Butte county has higher than state rates for colorectal, Hodgkin lymphoma, non-Hodgkin lymphoma, kidney and renal cancer, myeloma and testis cancer, making it share similarities with high weapons fallout areas and high INL emissions areas. **And in Jefferson county, north of the INL, the age adjusted thyroid cancer rate is 22.0 while the state average is 15.8.**

## NIOSH to Hold Meeting in Idaho Falls in August – Or Not.

## Radiation Worker Special Exposure Cohort Investigations Continue

Three special exposure cohorts for the Idaho National Laboratory have recently been recommended for approval: ANL-W 1951 to 1957 and the chemical processing plant (now INTEC) for 1970 to 1974. Investigations are continuing and definitely need to continue. Roughly two thirds of illness claims of INL workers are denied by the CDC because radiation dose reconstruction concludes that the doses were too low to have caused the illness. The radiation dose records and monitoring are often viewed as reliable and adequate by the CDC's National Institute of Occupational Safety and Health (NIOSH) dose reconstruction efforts, despite known record destruction and inadequate radiation control and monitoring practices at Department of Energy sites.

See the NIOSH Radiation Dose Reconstruction Program at http://www.cdc.gov/niosh/ocas. See the Idaho National Laboratory status at http://www.cdc.gov/niosh/ocas/ineel.html and see the portion of INL formerly ANL-W at http://www.cdc.gov/niosh/ocas/anlw.html

[23] Idaho Cancer Registry, see the map of counties that can be clicked on to get the 2009 to 2013 cancer incidence and mortality rates by county: http://www.idcancer.org/ContentFiles/special/CountyProfiles/CountyMap.htm

Meeting dates and times for the Advisory board are posted here: http://www.cdc.gov/niosh/ocas/pubmtgs.html but the meeting slated for INL and ANL-W topics is stated to be scheduled for August 2 in Ohio.

## Methods Used By Department of Energy to Estimate Radiation Dose from Internal Plutonium Are Highly Inaccurate

A study conducted in France of two incidents involving internal exposure by inhalation of transuranic compounds found that dose estimates could range from an insignificant 10 mrem (or 0.1 mSv) to a very significant dose of 30 rem (30,000 mrem or 300 mSv). [24]

The methods for assessing internal dose usually involve collection and evaluation of bioassay samples (urine and fecal samples). But the internal dose estimate based on urine was much higher than the dose based on the radioactive excretion rate indicated by fecal samples. The conclusion made by these analysts was that a reliable estimate of radiation dose could not be made based on the accepted model, the International Commission on Radiological Protection (ICRP) model, used by the Department of Energy, to estimate radiation dose. The biokinetics of the ICRP model do not reflect what is happening in the body and neither the urine or fecal excretion followed ICRP model behavior.

Based on experience in the US, I find that the ICRP model as applied by the Department of Energy cannot be said to be conservative — in fact, the model input assumptions may be contrived by DOE contractors to attain the lowest possible dose estimate in order to minimize the appearance of the incident severity. And from what I have witnessed, they may do so with DOE's blessing, including DOE's accident investigation oversight and Price Anderson investigations folks. There is simply no one who is an advocate for the exposed radiation worker, in the US at least.

The overexposed worker who gets a radiation illness may or may not get a fair assessment subsequently by the Center for Disease Control's NIOSH for Energy Worker Illness Compensation, as the exposure records may have disappeared or may be there but falsified intentionally or are inadequate because of inadequate monitoring of exposure conditions.

I would really encourage any radiation worker to read this candid study. Despite the technical-sounding methods, a scientifically sound explanation of the uncertainties in the dose estimate are not being provided and known reasons for underestimating the dose, like the presence of "super S class" highly insoluble but difficult to detect in lung count material may be present but DOE does not require identification of "super S class" material. Workers need to be

[24] "Assessing internal exposure in the absence of an appropriate model: two cases involving an incidental inhalation of transuranic elements" by Nicolas Blanchin et al. (cerca 2006) http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=8804577

aware of the extremely wide range of radiation dose estimate that can result from different weight, as selected by the analyst, of the lung, urine and fecal results, none of which may be in agreement, in conjunction with the ICRP model, in predicting what the intake of radiological material was, or what the amount of retention in the body is, or subsequently, what the committed effective radiation dose is.

## DOE Admits They Will Not Meet the September 2016 IDEQ Commitment Date to Commence Treatment with IWTU;

## No New Schedule Made by Fluor Idaho

If anybody can make the Integrated Waste Treatment Unit at the Idaho National Laboratory work to treat the liquid sodium-bearing waste, it's Fluor Idaho. But Fluor isn't saying when it might commence treatment with IWTU.

The Department of Energy announced, just prior to Fluor Idaho's takeover of the Idaho Cleanup Project's contract this June, that the schedule DOE committed to Idaho's Department of Environmental Quality last year for treating the waste starting this September, would not be met. Please remember that the DOE told Idaho's Attorney General Wasden a year and a half ago that DOE was "very confident" that they would commence treating the waste by June of last year.

Read about the problems with found with recent testing of the IWTU at the June INL Citizens Advisory Board meeting in Idaho Falls. [25]

## Would the Many Unsolved Mysteries in INL Environmental Monitoring of Airborne Contamination Be Solved By Considering CERCLA Soil Excavations?

As I have looked over many years of Idaho National Laboratory environmental monitoring reports, I have come to see that elevated levels of airborne contamination, when not due to Chernobyl, Fukushima, or Chinese nuclear weapons testing will be treated basically as a feigned uncertainty as to the source of the contamination.

The INL environmental monitoring reports repeatedly, upon elevated airborne contamination, will say something to the effect of the contamination levels being significantly higher on the INL site than off-site indicate that the source of the elevated air-borne radionuclide contamination appears to be the INL "but the source of the contamination was not identified."

[25] Idaho National Laboratory Citizens Advisory Board (INL CAB) at www.inlcab.energy.gov June 2016 meeting presentations.

I really wonder if these folks could say this with a straight face in front of other people.

I suspect that many of the mysterious and unidentified sources of elevated airborne contamination couldn't be the many contamination soil excavations at INL's Stationary Low-Power reactor (SL-1) site, Test Area North (TAN), Test Reactor Area, Central Facilities area or other INL sites. They apparently didn't consider these possibilities for airborne contamination and they did not include the airborne contamination from the soil removal actions in annual INL facility annual airborne emissions reporting either.

The more you examine INL's environmental reporting, the more mysterious it gets. Now they had to admit to the elevated antimony-125 in 1987 because it was clearly not from weapons testing and from the INL's FAST facility. And it was detected far off-site.

Again in 1987, americium-241 and plutonium-239 were detected in air monitoring, but "probably related to Site operation, although most was not linked to a particular facility or release."

In 1998, americium-241 and plutonium-238 spike. No source identified.

In 2004, the air monitoring showed Mud Lake gross Beta at seven times the normal average (based on 1987 levels) but no indication of this being an obscenely high value or what it's cause was is given.

The Idaho Department of Environmental Quality is helping to hide these mysteries by not displaying any environmental monitoring report prior to 1987. If you care about Idaho citizens, why don't you give IDEQ a call and tell them to post all historical environmental monitoring reports on their website, not just the most recent 4 years or so.

The more I have looked at the environmental monitoring reports, the more aware I have become that airborne contamination at INL spreads far and wide in a 50 mile or so radius from INL before it moves on. The pig pen of air contamination from INL is then denied because of the elevated offsite contamination readings.

Looking for historical INL environmental monitoring? Well, the reports beginning in 1959, began after some of the most egregious releases of radionuclides had commenced in 1952. These DOE health and safety reports then changed titles and number identifier schemes often, to keep under the radar and difficult to find. Then as legal challenges from sick citizen's increased, the reports for a time ceased in the 1960s. The reports reflect a love of all things nuclear as they glowing report of the latest technology. Radioactive emissions and contamination are glossed over as it is emphasized how many sites they are monitoring. Throughout the years of careful monitoring and depiction of watchfulness over the radiological air, soil, and aquifer released emerged many dozens of forever contamination sites throughout the 890 square mile Idaho federal site that the CERLCA cleanup is leaving behind.

IDO-12012, 1958 Health and Safety Division Annual Report.

IDO-12014, Annual Report of Health and Safety Division, 1959

IDO-12019, Annual Report of Health and Safety Division, 1960

IDO-12021, Health and Safety Division Annual Report (1961)

IDO-12033, Annual Progress Report, 1962 Health and Safety Division

IDO-12037, Annual Progress Report, 1963, Health and Safety Division

IDO-12073, Annual Report, 1969 Health Services Laboratory - 1960-1969 (Persons exposed to external radiation)

IDO-12075, 1970 Annual Report of the Health Services Laboratory (persons exposed to external radiation)

I get the feeling that the after 1963, the Atomic Energy Commission, Idaho Operations Office became too busy with various lawsuits of people with cancer to bother with making environmental monitoring reports.

If the era prior to 1970 was the time of creating the worst environmental insults all while merrily creating environmental safety and health reports, the enlightment one might hope for did not occur after 1970, or even after 1987 with the Environmental Protection Agency required DOE to start monitoring chemical contamination in the aquifer. If you can find the environmental reports to examine, each year is a watered-down summary of the quarterly data and addresses only a subset of the monitoring of the aquifer and surrounding areas in any particular year.

The INL digital library contains many of these earlier documents at https://inldigitallibrary.inl.gov/SitePages/INL%20Research%20Library%20Digital%20Repository.aspx . It contains a hodge-podge of more recent documents, some listed but not loaded. Some documents that are listed say no document was loaded; others have a few pages loaded but do not contain the report. Others contain most of the report but lack the appendices. Some reports are entered twice and are loaded in one location but not the other. Close enough for government work, apparently.

For some years. www.ostigov/scitech contains a limited set, mainly DOE/ID-12082 series reports from the 1990s. There are offsite monitoring reports like the ESRF- series reports and contractor onsite reports (EG&G, LMITCO, ICP, BEA etc.) that fed into the DOE/ID-12082 series reports. Keep in mind the Naval Reactors Facility at the Idaho site are sometimes folded into Idaho environmental surveillance reports and sometimes (1996 and later) reported separately. NRF reports appear on osti.gov for 1997 to 2003.

Oddly inconsistently, osti.gov/scitech contains some of the DOE/ID-12082 series documents but not all. (1989, 1992, 1993, 1994, 1995, 1997, 1998 some are loaded, some are not.). The

folks have osti.gov have kindly stated that if a report is not there, they may or may not load it — they admit that they may take weeks or months or simply not load a requested report at all.

The cleanup administrative record at https://ar.icp.doe.gov contains some environmental annual reports, 1988 through 1996, but not 1991, which is also missing on osti.gov.

The Stoller environmental reports are online at http://www.idahoeser.com/ for 1995 on, for annual and quarterly reports.

Idaho Department of Environmental Quality has used tax payer money to create reports since about 1987 but only posts online reports from 2010 and newer. IDEQ also has drinking water data posted online, but not INL radionuclide data for INL drinking water. The IDEQ drinking water data is rather unreliable in that zero may be entered for seriously non-zero analytes – so any data reading as zero needs to be confirmed with other monitoring information. Also, the investigation of sources of elevated contamination is virtually nil in the IDEQ drinking water reports.

## DOE Fails to Admit That Aquifer Monitoring Shows Test Reactor Area Not in Compliance with CERCLA Record of Decision

Aquifer monitoring at the Idaho National Laboratory in 2008 [26] and other times has shown that the Test Reactor Area or ATR Complex is not in compliance with the CERCLA cleanup record of decision. The Record of Decision (ROD) stated that it was known that tritium and hexavalent chromium exceeded federal drinking water standards in the aquifer. [27] [28] But the ROD also stated that no other contaminants were expected to exceed "normal background levels."

So it comes as a surprise to find levels of gross alpha contamination in the Snake River Plain aquifer at the Test Reactor Area wells exceeding not only normal background levels but the federal drinking water standard as well. If drinking water standards require multiple quarters of sampling to exceed the maximum contaminate level, the Record of Decision did not make such a qualifier. Gross alpha is exceeding background levels and also drinking water standards.

[26] "Annual Groundwater Monitoring Status Report for Waste Area Group 2 for Fiscal year 2008" July 2008, RPT-509 available at https://ar.icp.doe.gov It shows USGS MIDDLE-1823 at 26.4 pCi/L when the MCL is 15 pCi/L for gross alpha.

[27] S.M. Lewis et al., "Remedial Investigation Report for the Test Reactor Area Perched Water System (Operable unit 2-12)," EGG-WM-10002, June 1992. See https://ar.icp.doe.gov The report documents that Americium-241 at 100 times the drinking water maximum contaminant level was found in shallow perched water at TRA.

[28] Department of Energy DOE-ID, Record of Decision Test Reactor Area Perched Water System, Operable Unit 2-12, Idaho National Laboratory, Document ID 5230, US Environmental Protection Agency, Region 10, December 1992. . See https://ar.icp.doe.gov

Neither the CERLCA Five Year review admits this, nor the Idaho DEQ's monitoring which also found this. Other aquifer monitoring or waste water monitoring has also found gross alpha radionuclide contamination exceeding the federal drinking water standard, but no mention of the importance of the elevated levels is highlighted. Nowhere are reports discussing how this is not consistent with the CERLCA cleanup ROD and points to inadequate CERLCA investigation of the Test Reactor Area contamination.

CERCLA documents admit that records of Test Reactor Disposal well usage cannot be found. USGS wells used to monitor early years of excessive contamination were destroyed along with the data; some of the excessive contamination likely arising from retention basin, Materials Test Reactor spent fuel canal leakage, and material separations in the TRA Hot Cell facility and Hot Alpha Cave. [29]

Inexplicably, the US Geological Survey issued a report specifically addressing shallow and deep perched water at the INL that did not monitor for gross alpha or americium contamination at the Test Reactor Area even though years earlier the CERCLA investigation had found 100 times the federal drinking water maximum contaminant level for americium-241 at the Test Reactor Area in 1991. [30]

Subsequent to the 1991 CERLA cleanup investigation, the CERLCA monitoring failed to monitor the aquifer for americium-241 or gross alpha. [31] And new CERLCA contamination sites continue to be found at TRA and old assumptions used in previous analyses become invalid like the infiltration will be limited because of the MTR building — but the MTR building has now been removed. [32]

Importantly, total in soil contamination inventory of radionuclide contamination appear to be inadequate and underestimate the contamination at the Test Reactor Area (now called the ATR Complex) and have underestimated the existing contamination poised to migrate to the aquifer. This already migrating contamination has been underestimated by the analyses for the new replacement for the Radioactive Waste Management Complex burial ground, the Replacement

[29] EGG-ER-11113, "Preliminary Scoping Track 2 Summary Report for Op Unit 2-08," March 1994 documents USGS well A-35's existence between 1962 and 1979 and there were other wells at TRA that were destroyed after MTR was removed from service (see Figure 3 of EGG-ER-11113 and try to find these wells on the US Geological Survey's mapper now – They are not there).

[30] "An Update of the Distribution of Selected Radiochemical and Chemical Constitituents **in Perched Ground Water,** Idaho National Laboratory, Idaho, Emphasis 1999-2001" by Linda C. Davis, 2006-5236, DOE/ID-22199.

[31] Department of Energy Idaho Operations Office report, "Response to the First Five-Year Review Report for the Test Reactor Area, Operable Unit 2-13 at the Idaho National Engineering and Environmental Laboratory," DOE/NE-ID-11189, May 2005 at https://ar.icp.doe.gov , this report myopically looks only at short-lived radionuclides tritium, cobalt-60, strontium-90. **But no gross alpha monitoring is performed despite huge amounts of alpha contamination at WAG-2 found in 1991.**

[32] EGG-ER-11113 erroneously concludes that no soil sampling is needed and that the **MTR building will prevent infiltration that would spread the migration of radionuclide contaminants to the aquifer**. News flash: the MTR building was D&Ded. It's gone! This poorly conceived document (EGG-ER-11113) needs to be redone with less emphasis on trying to minimize the 5,460 curies it admits leaked from the MTR canal into the soil.

Remote-Handled Low Level Radioactive Waste facility to be built at the INL's ATR Complex.[33]

*Articles by Tami Thatcher, for July 2016.*

[33] US Department of Energy, "Environmental Assessment for the Replacement Capability for Disposal of Remote-Handled Low-Level Radioactive Waste Generated at the Department of Energy's Idaho Site," Final, DOE/EA-1793, December 2011. http://energy.gov/sites/prod/files/EA-1793-FEA-2011.pdf