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Troy, Idaho 83871-0220

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Review
of

Auxiliary Reactor Area

CERCLA
Cleanup Plan
by
Department of Energy
Environmental Protection Agency
Idaho Department of Environmental Quality

Waste Area Group 5

Submitted by Chuck Broscious

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Revision 9

DOE Photograph of Auxiliary Reactor Area with Chemical Evaporation Pond in the background.

The above ARA aerial photograph in DOE public mailing on the CERCLA cleanup plan is deceiving because this is all that remains on the surface of over 21 different facilities listed below that previously operated at the four Auxiliary Reactor Areas (ARA) I, II, III and IV. Significant soil, air and ground water contamination remains as the invisible legacy for future generations to contend with. DOE, EPA and the State of Idaho want the public to forget what was done at ARA and other INL facility areas. "Out of sight and print – out of mind."

This EDI review is intended to offer some perspective and information not offered by DOE and the EPA or more importantly our own Idaho State Department of Environmental Quality on the operations at the four ARA sites to offer more expanded view of what operations were co-located at the ARA. EDI went through the laborious process of Freedom of Information and Public Records Requests with the state taking years. It is extremely important to understand EDI only scratched the surface accessing relevant documents.

List Auxiliary Reactor Area Facilities

Auxiliary Reactor Area Facilities	ARA
Auxiliary Reactor Area - I (dismantled)	ARA-I
Army Reactor Program Support Building	
Mobil Power Plant Reactor No 1	ML-1
Nuclear Effects Reactor	FRAN
Fast Spectrum Refractory Metals Reactor	710
Hot Critical Experiment	HOTCE
Chemical Evaporation Pond	
Auxiliary Reactor Area - II	ARA-II
Stationary Low Power Reactor - I (dismantled)	SL-1
Auxiliary Reactor Area - III	ARA-III
Army Gas Cooled Reactor Experiment (dismantled)	GCRE
Auxiliary Reactor Area - IV	ARA-IV
Power Burst Reactor Facility	PBF
Evaporation Pond	PBF-10
Warm Waste Injection Well	PBF-05
Corrosive Waste Injection Well	PBF-15
Chemical Waste Evaporation Pond	
SPERT Area	SPERT
Dismantled Facilities	
Special Power Excursion Reactor Test - I	SPERT-I
Special Power Excursion Reactor Test - II	SPERT-II
Special Power Excursion Reactor Test-III	SPERT-III
Special Power Excursion Reactor Test-IV	SPERT-IV
SPERT Leach Pond	PBF-16
Waste Experimental Reduction Facility	WERF
Process Experiment Pilot Plant	PREPP

See below Attachment A map of INL that shows were these facilities are located in relation to the rest of INL.

This Environmental Defense Institute Review of Auxiliary Reactor Area (ARA) is submitted as part of the provisions provided for public comment under Comprehensive Environmental Response Compensation and Liability Act (CERCLA). The Idaho National Laboratory (INL) was placed on the National Priorities List (NPL) which designates hazardous waste sites requiring remediation under national law. Currently this process is conducted under CERCLA (also known as Superfund) that provides the legal process for cleanup remediation.

One primary CERCLA requirement is to conduct five-year reviews to assess the effectiveness of the cleanup plan to meet regulatory requirements. EDI view is that the original plan was flawed and therefore in order to meet the goals, the whole plan must be reevaluated.

The Auxiliary Reactor Area (ARA) Waste Area Group (WAG-5) is one of 10 WAGs at INL that according to DOE, EPA an Idaho Department of Environmental Quality (IDEQ) only includes the following in their joint public mailing. "The Auxiliary Reactor Area (ARA) Chemical Evaporation pond is an unlined surface impoundment what was used to dispose of waste water from Building 627, and it's located adjacent to the ARA-1 facility. This is one of four satellite locations that compose the Auxiliary Reactor Area facilities, located 7.5 miles east of the Central Facilities Area." [1]

Once again, this three government agency "trifecta" (DOE, EPA, IDEQ) in their joint public mailing deliberately failed to acknowledge the other operations that were co-located at the ARA and contributed to the mixed radioactive/hazardous contamination such as; Auxiliary Reactor, Power Burst Reactor, SL-1 Reactor and burial ground, Special Power Reactor Test [I,II,III] (SPERT), Mixed Radioactive Waste Storage Facility and incinerators Waste Experimental Reduction Facility (WERF) and Process Experimental Pilot Plant (PREPP). [2]

At first glance, the tri-agency Auxiliary Reactor Area cleanup plan appears to offer the type of information needed by the public in order to make an informed decision on whether the plan's preferred alternatives are the appropriate actions to take. Tables showing maximum concentration levels of contaminates and "preliminary remediation goals" (PRG) can offer just this kind of essential information. Unfortunately, the PRG listed in the plan bear no resemblance to the published Environmental Protection Agency's reference guide of risk values and PRG for radionuclide's concentration in soil that generates a one in a million (1E-6) lifetime cancer risk. The PRG's that DOE is using are a thousand times higher than the EPA's PRGs, yet the plan states that for "the lead preliminary remediation goal is the EPA approved screening level." [ARA pg.12]

If DOE has developed its own PRG independent of EPA or other regulatory agencies, then this fact must be noted and an explanation of how these PRG's are derived and what specific assumptions were employed in the development.

1. Proposed Plan for the Auxiliary Reactor Area Chemical Evaporation Pond, Idaho National Engineering Laboratory, June 1992, issued by U.S.DOE, EPA and Idaho Department of Environmental Quality. Here after referred to ARA Plan.
2. For more information on the SL-1 Reactor see Tami Thatcher's report on EDI's website.

The Power Burst Facility (PBF/ARA) proposed plan offers maximum contaminate levels on some less contaminated sites yet on the more serious contaminated sites the DOE refuses to offer maximum contaminate levels. For instance, the 1,000 gal. Hot waste tank at the Axillary Reactor Area I Operable Unit ARA-16, DOE fails to list the maximum contaminate levels. The table lists only contaminates of concern without concentration levels.

DOE also fails to acknowledge that the waste is mixed transuranic (MTRU) in an apparent attempt to sidestep regulatory requirements for this class of radioactive waste. DOE's own 1997 Track II Remedial Investigation Feasibility Study (RI/SF) acknowledged this waste as "F-listed transuranic (TRU) waste." The legal criteria for transuranic waste is it must contain greater than 100 nano curies per gram of transuranic radionuclides (heavier than uranium) with a half-life greater than 20 years. Consistently, DOE deliberately fails to show contaminates in the same units as regulatory limits. Thus frustrating the public understands of the problem. This RI/FS lists the following TRU contaminate levels in (ARA-16) with EDI's unit translation.

Americium-241	0.45 micro curies/gram = (450 nano curies/gram)
Plutonium-238	0.33 micro curies/gram = (330 nano curies/gram)
Plutonium-239	0.29 micro curies/gram = (290 nano curies/gram)

1,1,1-trichloroethane	10,300 ug/L
Trichloroethene	4,800 ug/L

[DOE/ID-10555 @A-8 &D-17]

At an INL cleanup plan hearing DOE officials noted that another sample of the ARA-16 hot tank contents indicated that the waste was "mixed low-level." When there are only two data sets, DOE cannot arbitrarily chose one over the other without some credible justification that so far is absent. In other words, if DOE had a dozen samples of the tank waste, and eleven indicated mixed low-level and one indicated mixed TRU, then one may conclude that preponderance of evidence points to mixed low-level. Another discrepancy between the ARA Plan and the RI/FS is the volume of tank contents which according to the RI/FS the contents are greater than three times the volume noted in the plan.

The plan considers the ARA-16 tank itself as low-level waste without offering any sampling data to substantiate this waste classification. Since the tank held mixed transuranic waste for nearly fifty years, the only reasonable assumption is to consider the tank itself as MTRU until sampling data demonstrate otherwise. Therefore, the plan's preferred alternative to bury the tank on-site would not meet regulatory requirements because DOE has no EPA permitted disposal sites at INL for MTRU much less at the ARA.

The proposed plan offered ARA-16 hot tank contents remedial alternative-3 (in-situ vitrification) of on-site disposal of the tank and its contents which again would be in violation of the statutes

because the agency cannot legally dispose of TRU on the INL site. [3]

Although alternative 3 is not the preferred alternative, DOE has an obligation to offer cleanup alternatives that meet regulatory requirements which is clearly not occurring. Miss information of this type undermines the credibility of the process and reduces the public's confidence in the state and federal regulatory agencies to protect their constituents.

Another ARA operation was SPERT-III, a high temperature, pressurized (2,500 psi) light water reactor built in the late 1950's, went critical in 1958, and was placed on standby in 1968. The April 14, 1964, SPERT-III test released 1900 Curies (a huge release) to the atmosphere producing a radioactive cloud that was tracked for 2.5 miles. The reactor surged in one hundredth of a second from zero to thirty billion watts. Using different cores the reactor continued to run until an accidental melt-down in 1968. [Norton]

The SPERT-III site was later to be used for the WERF incinerator. SPERT-IV, constructed in 1960, and was called a swimming pool reactor; was immersed in a 30 foot diameter tank and was placed on standby in 1970. These tests demonstrated reactor instability and power oscillations. SPERT project manager Boyd Norton acknowledges "...that it got pretty scary in the control room when the power began oscillating out of control and threatened to blow the thing apart. Being at the reactor console was ... a total exercise in sphincter control." SPERT-IV was later converted to the Capsule Drive Core, forerunner of the Power Burst Facility, which was built a few years later." [Norton] What was left of the SPERT reactors and components were buried at the RWMC. [ERDA-1536, p.II-244-246] [Guide Pg.41-85]

Numerous incinerators including Waste Experimental Reduction Facility (WERF), the Process Experimental Pilot Plant (PREPP), ICPP Denitration Facility, Specific Manufacturing Facility, Waste Calcine Facility (WCF), and the New Waste Calcining Facility (NWCF) have been built at INL as part of DOE's national nuclear waste volume reduction program. Additionally, several high-temperature waste "evaporators" have been added at INTEC in recent years. [4] Stack emissions from these INL facilities should be considered in evaluations of health risk assessments due to their radioactive and toxic nature and lack of independent monitoring. Between 1952 and 1989, an estimated 18,564,868 Curies (Ci) were released from INL facilities. [ID-10054-81 @13][ID-10087-85&7 @6] [DOE/ID-12119]

The WERF and PREPP incinerators previously operated at INL's Axillary Reactor Area (ARA) without an Environmental Impact Statement being filed. Resource Conservation Recovery Act (RCRA) interim permits were grand-fathered in and final permits never issued. None of the INL incinerators/waste process plants have had "trial burns" that is currently required to demonstrate that emissions meet regulatory requirements. After considerable public pressure on the regulators, DOE finally, after decades of operating WERF, conducted a trial burn May of 1997. On May 12 DOE reported that the May 8 trial burn resulted in exceeding regulatory limits for chlorine emissions (hydrogen chloride).

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3. Settlement Agreement and Consent Order by Federal District Court for State of Idaho

4 EDI's view is that DOE uses this nomenclature "high-temperature evaporators" deliberately to avoid more restrictive emission regulations for incinerators. See EDI's website for challenges to DOE/INTEC Integral Waste Treatment Facility (IWTF).

WERF operators ignored the monitoring instruments and failed to shut the incinerator down. In March 1997, a 14 inch crack was discovered in the transition area between the primary combustion chamber and the ash ram that allowed waste to run out onto the floor. The crack was a failure of an earlier weld repair. The chlorine emissions resulted in a violation of state regulations. Only non-radioactive emissions are regulated since radioactive materials are not considered a hazardous material under RCRA. But, when hazardous materials are commingled, RCRA covers it as "mixed waste". Radionuclides are virtually always in INL's waste streams. The state is currently "enforcing" RCRA for EPA BUT is not monitoring for radioactive emissions. RCRA reauthorization to have radionuclides listed as RCRA controlled remains a contentious issue in Congress.

Incineration of mixed radioactive and hazardous waste has been utilized by DOE for decades as a means of avoiding RCRA regulation. Lax state and EPA enforcement have allowed DOE, through incineration, to separate RCRA listed materials from radioactive materials. The process of incineration burns off the volatile hazardous constituents. The radioactive ash then falls into a non-regulated category and can be buried in shallow trenches at RWMC as "low-level" waste.

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.

As part of the compliance with the FFCA, DOE awarded in December 1996 one of the largest privatization contracts to British Nuclear Fuels (BNFL) Inc. to incinerate mixed transuranic waste at the INL. This $1.18 billion facility was slated to incinerate mixed transuranic (TRU) waste at INL's Radioactive Waste Management Complex dump. DOE claims it "shifts the operational liability and risk to the contractor through a fixed-priced contract and only makes payment for waste actually treated." "Privatization of waste treatment is cheaper than the government making a large investment in owning and operating its own treatment facilities." [DOE This Month 1/97]

One need go no further than the failed BNFL INL Pit-9 privatization project to see how the original contract has already been vacated and now DOE is faced with a new contract for twice the original amount. As for shifting liability, the Pit-9 process shows clearly that regardless what they try to call it, the US taxpayer still pays the full costs and ultimately is left holding the bag.

The broad variety of operations at INL results in a proportional variety of radioactive emissions from these plants. Few are benign - otherwise they would have been built in urban areas close to research centers. For more information on other INL environmental issues go to EDI's website.

Idaho Department of Environmental Quality is aware that the INL is burning material contaminated with radioactive isotopes but is reluctant to take a stand and regulate radioactive emissions under Resource Conservation Recovery Act (RCRA). "We have no regulatory authority over high-level waste. No one in the state has looked at it in the past."[Times-News(c)] Emissions from these incinerators pose a serious health hazard and deserve independent monitoring for radioactive emissions by State and EPA regulators.

"The primary objective of the PREPP [incinerator] is to process select transuranic- contaminated waste [radioactive elements heavier than uranium] that has been generated in national defense programs. The process is designed to convert the waste into a form acceptable for disposal at the Waste Isolation Pilot Plant (WIPP). During the initial years of operation, the principal PREPP activity will be the incineration of hazardous waste. Although the facility has the potential to release toxic air pollutants, its current application for the IDHW air permit does not specify hazardous waste incineration." [DOE/EH/OEV-22-P, p.3-13] PREPP completed TRU waste test burns in 1992 and it was expected to be supplemented by a newer incinerator called the Idaho Waste Processing Facility (IWPF). Public opposition and litigation forced DOE to close WERF, PREPP and abandon the IWPF.

"Identified radionuclides that will be released during incineration of transuranic waste include plutonium-239, 240, 241, and 242; americium-241; curium 241; and uranium-233." [DOE/EH/OEV-22-P, p.3-13] Of particular public concern is the effectiveness of the high efficiency particulate arresters (HEPA) filters which are the final stage of INL's incinerators, Fluorinel and Fuel Storage Facility (FAST), Fuel Processing Facility (FPF), and other ICPP emissions control system. [ENI-217, p.33] The effectiveness of the HEPA filters to control toxic emissions to the environment is challenged by independent researchers. [Goldfield, p.1]

Failure of these filters to actually provide the emission control claimed by DOE would result in additional unplanned toxic releases to the environment. DOE acknowledges, in accident scenarios, that failure of these HEPA filters are the most serious potential release risk of radioactivity to the general public. [ERDA-1536, p.I-5]

Less than 7 miles west of ARA is INL's Idaho Chemical Processing Plant (ICPP) now called INTEC. "A radioisotope of antimony, Sb-125, was determined to be escaping ICPP's Fluorinel and Fuel Storage Facility (FAST) ventilation exhaust particulate filters, due to its presence as a stilbene (SbH_3) gas. Stilbene gas is unstable and rapidly undergoes chemical decomposition into a particulate form (Sb_2O_3) in an oxidizing environment."... "Antimony-125 was detected in air at both on-site and off-site monitoring stations in the fourth quarter of 1986 and continues to be detected in 1987. Unlike previous years, in which the isotopes of the noble gases comprised the majority of hypothetical dose to an off-site person from INL, 78% of the calculated dose (0.11 mRem) to a maximally exposed individual in 1986 from routine operations was due to Sb-125." [DOE/INL-12082(86)-NTIS] Approximately one curie of Sb-125 was released in 1986, and the annual 1987 release was expected to be at least 10 times higher. [DOE/ID-12111@37]

Without forensic investigation, there is no way to know that radioactive/chemical contaminates at ARA only came from only those operations located there. It is instructive to understand the limitations on emission control systems. Additionally, it is crucial the appreciate that lax or

non-existent environmental laws and enforcement we will continue to leave a tragic environmental legacy for future generations both in the soil, water and our children bodies.

Two successful law suits against DOE incinerators forced the closure of Rocky Flats and Lawrence Livermore facilities for radioactive and chemical emissions violations. A third lawsuit was been filed April 2, 1996 against DOE's Los Alamos site for radioactive emissions violating the Clean Air Act. [CCNS v. USDOE] Exhaustive and highly credible scientific reviews have independently cast light on the hazard of DOE's HEPA filter control systems at these other sites. Institute for Energy and Environmental Research's (IEER) Radioactive and Mixed Waste Incineration report cites the findings of Lawrence Livermore National Laboratory internal review panel recommendations against a proposed mixed waste incinerator in California.

"We have never been comfortable with the EPA's position that incineration of mixed waste to eliminate its chemical toxicity should be the first procedural step and burial of its radioactive residuals the second step. This approach commits to the volatilization of important radionuclides, including tritium, carbon-14, and several isotopes of iodine. Furthermore, the incineration of non-volatile nuclides, including those of uranium and plutonium, leads to a finite, although exceedingly small, probability of radioactivity is emitted from the incinerator's stack. We view incineration as a violation of the cardinal principle of radioactive waste management; namely, containing radioactivity rather than spreading it." [IEER (b) @1]

IEER's report also cites an EPA study of DOE mixed waste incinerators that showed that exposure of the public to tritium and plutonium-239 from this incinerator's emissions could exceed the federal standards for off-site radiation doses, in the latter case by more than 10 times. [IEER (b)]

"The most difficult elements to contain are the highly volatile radioactive elements, namely tritium, carbon-14, and several isotopes of iodine. Pollution control systems typical of most incinerators have no effect on these radionuclides, allowing the total input to the incinerator to exit out the stack, unless special filters are employed."... "The vast majority of less volatile radionuclides such as plutonium and cesium-137, which tend to condense onto particles, remain in the ash or filters following combustion. Radioactive particles that do escape filters, however, are small in diameter and can be carried by winds over long distances. Due to their small size, fine particles (radioactive or otherwise) can more easily be inhaled and lodge in the sensitive inner lining of the lungs than larger particles. Since incineration can disperse radioactive elements, especially those not amenable to filtering it can increase near-term population doses compared to securely storing the wastes." [IEER (b) @21]

Aerial Surveys for Gamma radiation were conducted in 1976 to determine radioactive concentrations around INL facilities and are presented below. ARA is tied with TRA for the highest radioactive surveys.

INL 1976 Aerial Surveys for Gamma radiation

Facility	**Concentration in uR/hr.**
Test Reactor Area	5,000
ICPP	2,500
ERB-I Reactor	90
Borax Reactor	200
ERB-II	150
OMRE/EORC	3,000
Test Area North / TSF	150
Auxiliary Reactor Area	**5,000**
Central Facilities Area	1,000
CFA Drain Field	800
Radioactive Waste Management Complex	3,000
Health Physics Laboratory	3,000
Naval Reactors Facility	1,800

[ERDA-1536 @ III-15 to 34] [Units U Rad = micro = one 1 millionth of a rad]

Exposure rates in the above survey for Cobalt-60 and Cesium-137 were calculated to be 22,118.4 and 10,444.8 uR/hr. respectively. [ERDA-1536 @ III-15 to 34] Also the above aerial survey listing clearly identifies Test Area North and the Auxiliary Reactor Area as the highest radiation emitters. The survey does not state whether the ICPP was processing fuel or whether the ICPP Calciner was operating at the time of the survey, so it is possible that they were temporarily not releasing much radiation. Also, it should be noted that the Central Facilities Area emissions were mainly due to the laundry that washes contaminated (10 mR/hr.) worker clothing and respirators. [ERDA-1536@II-161]

The second highest reading for the Health Physics Lab is particularly curious. One might expect this lab to be the most conscientious about its emissions.

1990 Aerial Radiological Survey of ARA Area [5]

"The SPERT, PBF, WERF, and MRWSF show levels of man-made radioactivity, as indicated in report's maps using monitoring data collected from over-flights of INL. Below is excerpts related to ARA data. Cesium-137 (137Cs) is present at each of these sites as seen in the reports maps and that indicates the presence of Cobalt-60 (60Co) at PBF and WERF.

"Two reactor sites are located in the ARA area of interest. These reactors are designated ARA-II and ARA-111. ARA-II dominates the terrestrial gamma exposure rate, man-made gross counts (MMGC), and net 137Cs count-rate contour maps (Figures 19, 21, and 22, respectively listed in the table below.) The isotope of interest in the area of ARA-II is 137Cs. After spectral analysis in the area of ARA-III, the presence of cobalt-60 is possible, but the spectral signature in Spectrum 3, Figure 20 is not definitive.

5 An Aerial Radiological Survey of the Idaho National Engineering Laboratory and Surrounding Area, H. A. Berry, et.al., Date of Survey: June 1990 – August 1990, DOE/NV/11718-020.

"The same data averaging or gridding over 800-ft square blocks performed on the aerial data acquired over the ICPP was also performed on the flight data over the ARA. In Figure 22, the dashed contour lines indicate the 800-ft gridded data and also better demonstrate the distribution of 137Cs on the surface.

"The 137 Cs data used to generate the contours in Figure 22 were used to estimate the radioactive inventory listed in Table 6 (see page 10). The same procedures and assumptions, as previously discussed in Section 10.2, were used in the ARA area of interest.

Auxiliary Reactor Area 137-Cs Inventory [6]

Contour Interval (cps)	Number of Data	Area Included (km2)	Inventory (a)
30 — 60	48	2.9	0.2
60 — 300	27	1.6	0.3
300 - 1,000	6	.4	0.3
Total	**81**	**4.9**	**0.8**

a. For a depth distribution of the form $A = Ao\ e^{-0.2z}$; z =depth, cm
b. DOE/NV/11718-020, pg. 10,Table 6

6 DOE/NV/11718-020, pg. 10

1990 Aerial Radiological Survey of ARA Area [7]

Location at ARA	Sample	Maximum Quantity	Reference
ARA-II	Terrestrial Gamma Exposure Rate at 1 Meter	580 uR/hr.	Figure 4 Pg.15
ARA-II	Man-Made Gross Count Rate	10,000 cps	Figure 6 Pg. 17
PBS/SPERT	Man-Made Gross Count Rate	100,000 cps	Figure 15 Pg.26
PBS/SPERT	Net Cobalt-60 Count Rate	5,000 cps	Figure 18 Pg. 29
ARA-II	Terrestrial Gamma Exposure Rate at 1 Meter	53 uR/hr.	Figure 19 Pg. 30
ARA-II	Man-Made Gross Count Rate	10,000 cps	Figure 21 Pg. 32
ARA-III	Man-Made Gross Count Rate	1,000 cps	Figure 21 Pg. 32
ARA-II	Net 137 Cs Count Rate	5,000 cps	Figure 22 Pg. 33

2003 ARA Soil Core Analysis for Cesium-137 [8]

Location	Maximum Cs-137 Concentration pCi/g	Location	Maximum Cs-137 Concentration pCi/g
Area 4-6	649.5	Area 2-10	184.0
Area 1-4	160.0	Area 4-1	40.3
Area 2-4	275.0	Area 4-5	255.5
HR-6	137.0	Area 2-6	544.9
HR-8	86.1	Area 2-8	158.0

Also missing from the tri-agency CERCLA analysis is how DOE's ARA operations and other operation emissions affected the surrounding communities in terms of atmospheric contaminates and soil depositions. This is a deliberate and gross deficiency on the part of the regulatory agencies that attempts to understate the effect of their non-existent environmental control and the environmental health effects on workers and neighboring populations.

7 An Aerial Radiological Survey of the Idaho National Engineering Laboratory and Surrounding Area, H. A. Berry, et.al., Date of Survey: June 1990 – August 1990, DOE/NV/11718-020.

8 In Situ Depth Profiling of Cs-137 Contamination in Soils at CERCLA Site Auxiliary Reactor Area 23, Operable Unit 5-12, EDF-3318, 04/09/03.

Radiological Monitoring Data in INL Region [ERDA-1552-D @E-3 to 13]

Monitor Site	Date	Concentration	Isotope
ID Falls	2/65	24 pCi/L	Sr-90
Butte, MT	7/66	15 "	Sr-90
Butte, MT	3/65	125 "	Cs-137
ID Falls	3/66	45 "	Cs-137
Preston, ID	8/65	88 "	Gross Beta
Preston, ID	7/66	6 "	Gross Alpha
La Barge, WY	10/71	5 "	Gross Alpha
ID Falls	5/65	29 pCi/Kgm	Sr-90
ID Falls	2/65	140 pCi/Kgm	Cs-137

As a part of DOE's INL monitoring activities, milk samples were taken and tested primarily for Iodine-131. The current MCL for I-131 is 3 pCi/L, Sr-90 is 8 pCi/L, and Cs-137 is 200 pCi/L. Milk sampling around INL in 1958 notes that the I-131 activity was below the, then, permissible level of I-131 in water which was 3 x 10^{-5} uCi/ml (30,000 pCi/L). [IDO-12082(58) @76] Compared to current standards, the preceding milk iodine concentrations represent extremely high numbers. The following are acknowledged contamination concentrations in milk sampled from dairies and farms around the INL region. [DOE/ID-12119@E-34-48]

Iodine-131 Milk Samples in INL Region

Year	Month	Amount pCi/L	Month	Amount pCi/L
1958	Feb.	980	Mar.	2,250
	May	1,780	Oct.	5,600
1959		1,500		
1960	Jan.	1,400	Aug.	188
	Mar.	700	Oct.	400
1961	Jan.	200		
1962	Sept.	200	Oct.	140
	Nov.	320	Dec.	200

[DOE/ID-12119@E-34-48]

Monitoring Data on Food Stuffs in INL Region

Year	Food Stuff	Concentration
1960	Milk I-131	2 x 10^{-6} uCi/ml [2,000 pCi/L]
1961	Milk I-131	1 x 10^{-7} uCi/ml [100 pCi/L]
1963	Milk Sr-90	230 uuCi/L [230 pCi/L]
1963	Wheat Sr-90	170 uuCi/Kgm [170 pCi/Kgm]
1963	Wheat Cs-137	800 uuCi/Kgm [800 pCi/Kgm]
1963	Wheat Manganese-54	560 uuCi/Kgm [560 pCi/Kgm]

[Monitoring Reports 9,10,11,12 and 13; Environmental Monitoring Data Annual Guides][Cited by Blain @ 22 to 25]

The proposed ARA cleanup plan offers the public access to INL Administrative Record through DOE's Internet website. Having personally attempting numerous times to utilize this site, I can categorically say it is ventrally unusable, presumably, because the documents are scanned in as a graphic rather than in text mode. Unless a person has a super-fast computer and modem, it would take weeks to browse through a single RI/FS.

Attachments

Attachment A; INEL map for 25 year land use Scenario that shows ARA in relation to other INEL facilities.
Attachment B; ARA-III before decontamination and dismantlement showing exhaust stacks.
Attachment C; The Power Burse Facility (PBF) reactor and AREA-III during advanced decontamination and dismantlement.

Reference:

DOE-ID-10555: Final Work Plan for Waste Area Group 5 Operable Unit 5-12 Comprehensive Remedial Investigation/Feasibility Study, Idaho National Engineering Laboratory, U.S. Department of Energy Idaho Operations Office, DOE-ID-10555, Rev 0, May 1997

Risk Comparison for Radionuclides in Soil, A quick reference guide of risk values and Preliminary remediation Goals derived from RISKCALC computer software based on RAGS HHEM Part B, Steve M. Dean, U.S. Environmental Protection Agency Region 9, and December 1996

ERDA-1536; Waste Management Operations, INEL Final Environmental Impact Statement, US Energy Research & Development Administration, September 1977

ERDA-1552; Final Environmental Impact Statement, Safety Research Experiment Facilities, INEL, September 1977, US Energy Research & Development Administration

DOE/ID-10557; Comprehensive Remedial Investigation / Feasibility Study for the Test Area North Operable Unit 1-10, Idaho National Engineering Laboratory, US Department of Energy Idaho Operations Office, DOE-ID-10557, November 1997

DOE/EH/OEV-22-P; Environment, Safety, and Health Needs of the US Department of Energy, September 1988

DOE/INL-12082(86), NTIS Approximately one curie of Sb-125 was released in 1986, and the annual 1987 release were expected to be at least 10 times higher. [DOE/ID-12111@37]

DOE/ID-12111; Summaries of the INEL Radioecology and Ecology Program, O. Markham, June 1987

DOE/ID/12119; INEL Historical Dose Evaluation, USDOE ID Operations Office, Aug 1991

Guide; Citizens Guide to Idaho National Laboratory, Environmental Defense Institute, Pg41-85

IDO-10054-81; Radioactive Waste Management Information, 1981 Summary and Record to Date, June 1982, DOE ID Operations Office

IEER (a); Estimating Risks and Doses from the Nuclear Weapons Complex; Case Study of the Feed Materials Production Center, Fernald, OH, Institute for Energy and Environmental Research, B. Franke, Arjun Makhijani, Stacy Stubbs, December 2, 1991

IEER(b); Radioactive and Mixed Waste Incineration, D. Kershner, S. Saleska, A. Makhijani, Institute for Energy and Environmental Research, June 1993

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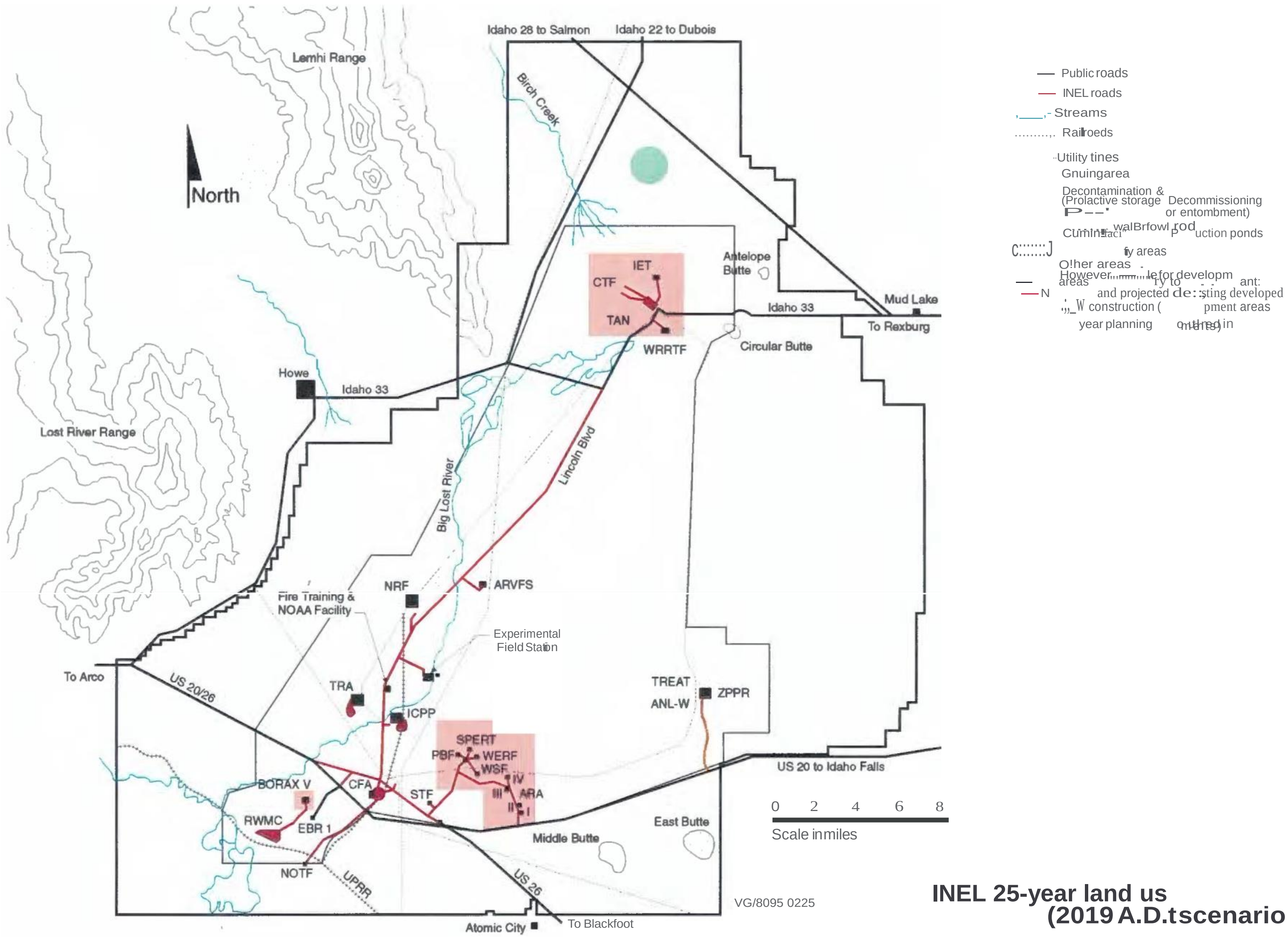
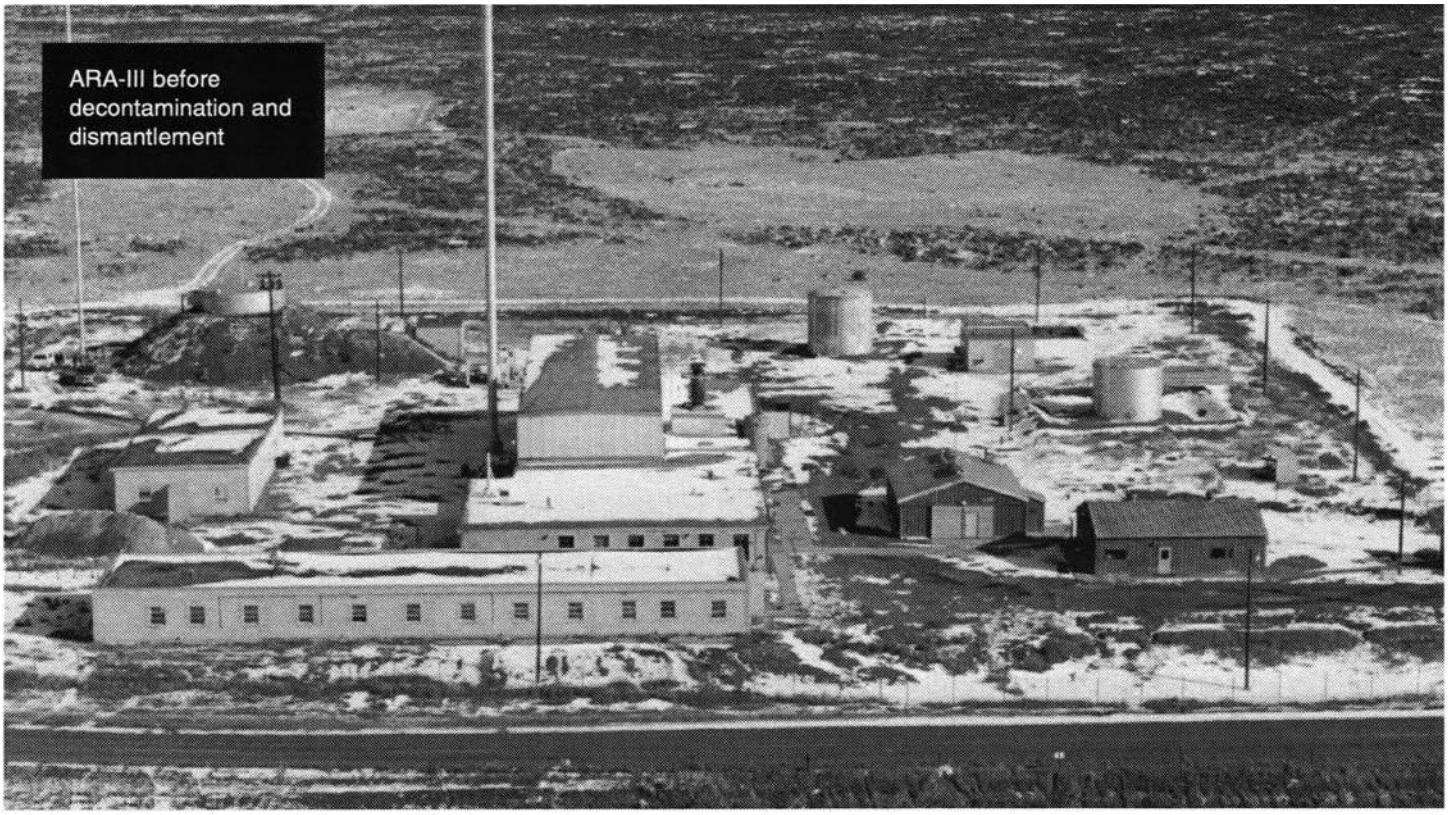
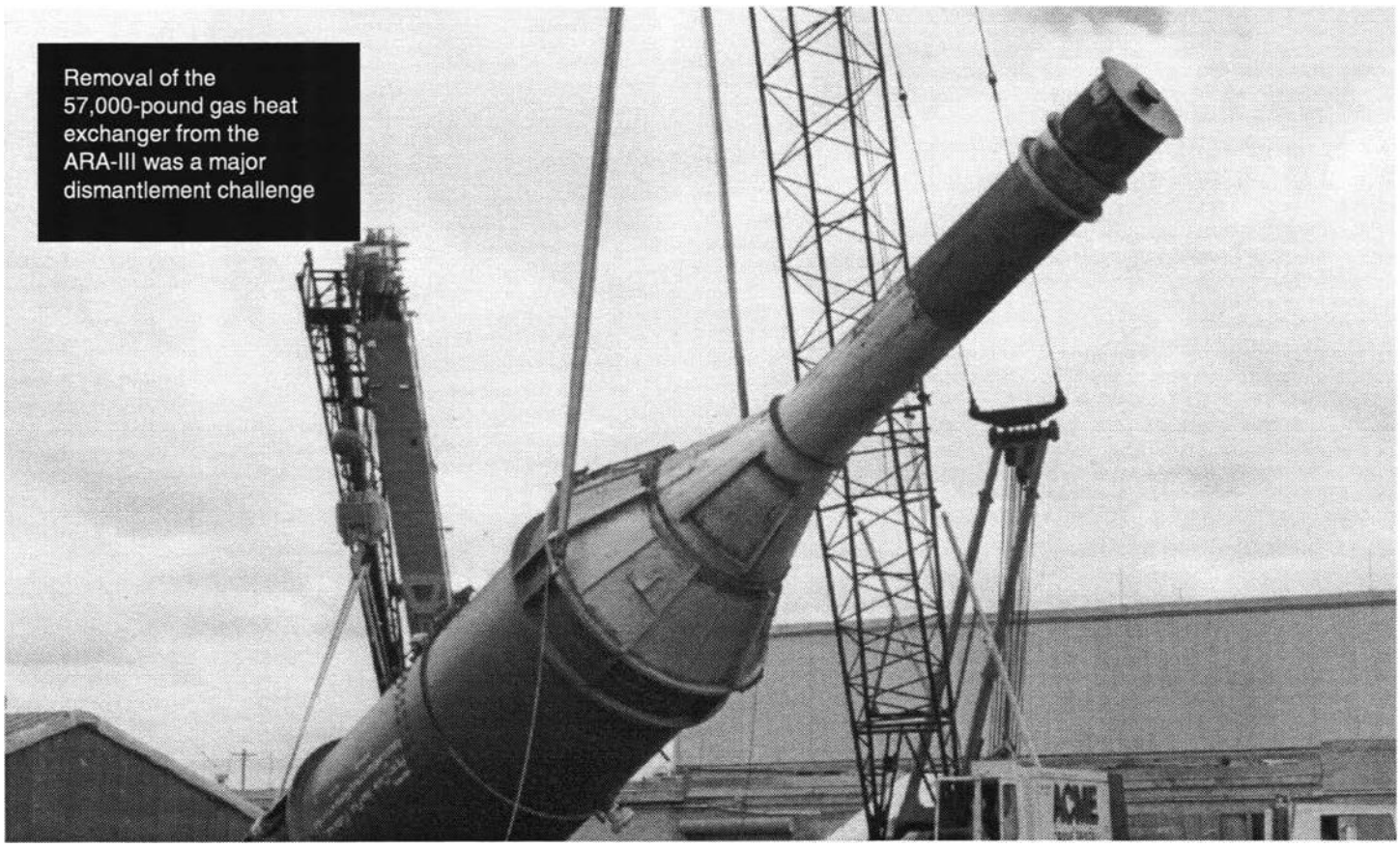

Idaho 28 to Salmon
Idaho 22 to Dubois
Lemhi Range
Birch Creek
North
Public roads
INEL roads
Streams
Decontamination &
(Proactive storage
Decommissioning
or entombment)
uction ponds
Antelope Butte
IET
CTF
TAN
WRRTF
Mud Lake
Idaho 33
To Rexburg
Circular Butte
Howe
Idaho 33
Lost River Range
Lincoln Blvd
Big Lost River
ARVFS
NRF
Fire Training &
NOAA Facility
Experimental
Field Station
To Arco
US 20/26
TRA
ICPP
TREAT
ANL-W
ZPPR
SPERT
PBF
WERF
WSF
IV
III
ARA
II
I
BORAX V
CFA
STF
RWMC
EBR 1
US 20 to Idaho Falls
0 2 4 6 8
Scale in miles
East Butte
Middle Butte
NOTF
UPRR
US 26
VG/8095 0225
Atomic City
To Blackfoot

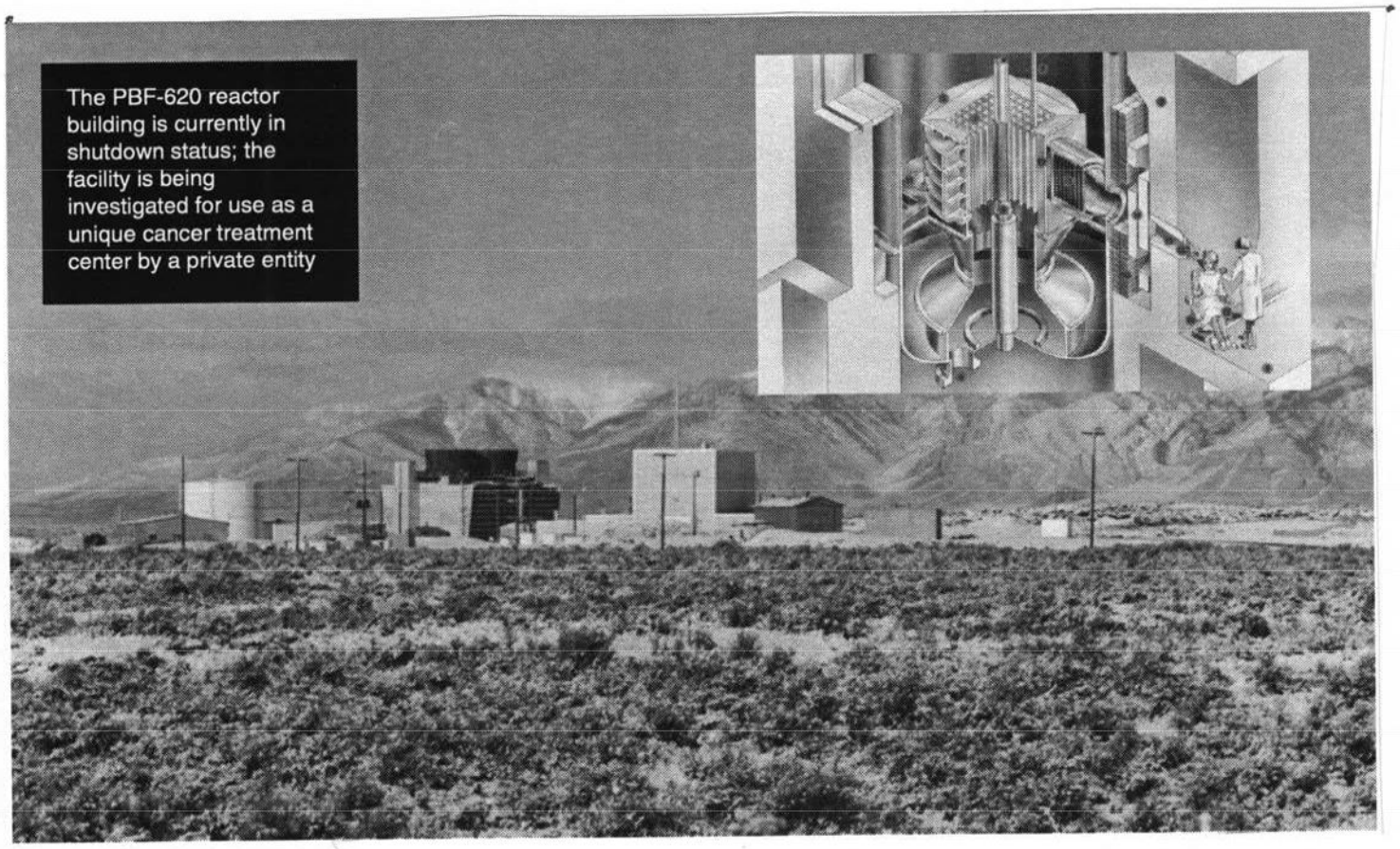
INEL 25-year land us
(2019 A.D.tscenario



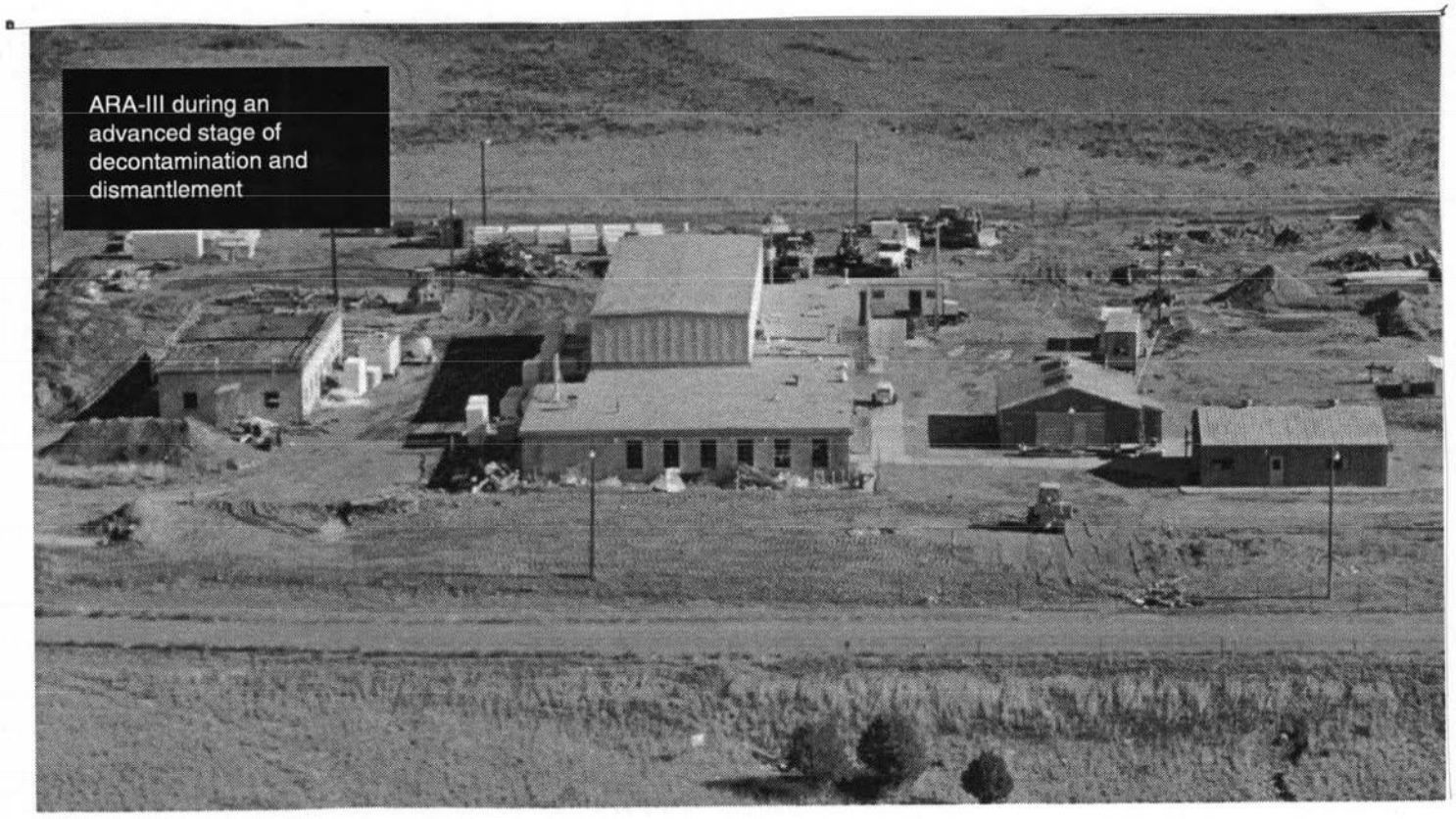
ARA-III before decontamination and dismantlement



Removal of the 57,000-pound gas heat exchanger from the ARA-III was a major dismantlement challenge



The PBF-620 reactor building is currently in shutdown status; the facility is being investigated for use as a unique cancer treatment center by a private entity



ARA-III during an advanced stage of decontamination and dismantlement