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# Comments
# on
# Centers for Disease Control and Prevention

# INEEL Dose Reconstruction Health Study

# Atmospheric Source Terms
# for
# INEEL Chemical Processing Plant
# February 2003
# Draft Report

submitted on behalf of
Environmental Defense Institute
by
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## I. Summary

The Environmental Defense Institute (EDI) offers these comments [1] to Centers for Disease Control and Prevention (CDC) and its sub-agency National Center for Environmental Health and Safety (NCEH) on previous contractor reports by Risk Assessment Corp. (RAC) [2] and current Sanford Cohen and Associates (SC&A) and subcontractor SENES Oak Ridge (SC&A/SENES) [3] related to the agency's INEEL Dose Reconstruction Health Study. EDI's formal comments on CDC/RAC reports were previously submitted 3/7/01. The EDI comments below merge both our previous RAC report review and current SC&A report comments because the major unresolved issues that flowed from RAC continued into the SC&A report documentation for CDC on INEEL historic radioactive releases.

Fundamentally, contractors or sub-contractors cannot be faulted if the CDC puts a strangle-hold noose around what information can be reviewed and, more importantly, restricts costs related to researchers going to remote government archives to review relevant reports. That being said, it is predictable when CDC contractors do not fully disclose (even as uncertainty analysis) in their reports the limitations imposed by CDC on document review and report agency censorship. Tragically, the general public remains in the dark about what really impacts their health and safety.

EDI submitted numerous Freedom of Information Act (FOIA) requests and received tens of thousands of pages of previously classified "Secret" documents, some "blacked out" for "security declassification" reasons. Although useful and informative, these FOIA document still do not disclose the full information required because huge gaps remain undisclosed. At best EDI can only offer "snapshots" based on what limited information has been made available via FOIA. Despite the huge limitations, the comments below reveal major deficiencies to CDC's INEEL Dose Reconstruction Health Study.

EDI originally submitted a petition (together with thirteen other organizations) to CDC in July 1990 that subsequently was followed by then Idaho Governor Andrus request to CDC to conduct a comprehensive health study of INEEL.

As documented below, CDC stood aside for many years while DOE destroyed crucial documents needed to establish INEEL radioactive releases to the environment, and then claimed that there was "inadequate data." The current CDC/SC&A reports fail to:

- Include all relevant documents to ICPP radiation releases
- Include all ICPP "green fuel/slug " process runs in release estimates
- Include the most exposed individual in dose calculations
- Acknowledge massive document destruction that impaired research
- Include Nevada nuclear bomb test fallout on Idaho in cumulative dose calculations

EDI documents below that RaLa production from "hot" piolet plant runs in 1954 through full scale production extended through 1963 with a total of about 83 runs and barium-140 throughput production at about 3.8 million curies. CDC only analyzed 31 of these runs between 1957 and 1959. The bottom line from EDI's perspective is that the CDC's INEEL Dose Reconstruction Health Study reports are grossly inaccurate and continue to significantly underestimate the mixed hazardous and radioactive contaminates released to the environment that impact the health and safety of residents of the region.

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[1] These EDI comments are necessarily "preliminary" due to the ongoing lengthy and arduous process of reviewing tens-of-thousands of pages of DOE/INEEL documents received through the Freedom of Information Act (FOIA) on top of thousands of pages of CDC reports finally pried out of the agency after numerous requests. For updates to these EDI comments see http://www.environmental-defense-institute.org

[2] Risk Assessment Corp. Report # 3 CDC Task Order 5-2000-Final.

[3] Atmospheric Source Terms for the Idaho Chemical Processing Plant, 1957-1959, SC&A/SENES Oak Ridge, Contract No. 200-2002-00367, February 2003.

# II. Background

## A. Access to Current Information

The Environmental Defense Institute (EDI) offers this background information because it is crucial to readers to put these comments into the context of over a decade of public input and Centers for Disease Control and Prevention (CDC) research methodology developmental process that shapes the current INEEL Dose Reconstruction Project and information the CDC offered to the public. CDC initially (early 1990's) contracted with Sanford Cohen & Associates (SC&A) to conduct Phase-I of the INEEL Dose Reconstruction studies. After major failures, SC&A was replaced by Radiological Assessment Corp. (RAC). And now, despite its previous record during the Phase I, SC&A is back as CDC's contractor with new project management and subcontractor SENES of Oak Ridge.

EDI received no official notice from CDC that the September 2000 Draft Task Order 5 report or the subsequent Sanford Cohen and Associates (SC&A) reports dated February 2003 were available. [4] Comments herein combine CDC subcontractor RAC and SC&A reports because of fundamental unresolved issues in these progressively inadequate reports. Only recently did EDI hear anecdotal knowledge that these current SC&A reports were available and requested a copy (not on CDC/NCEH website) from CDC. After concerted efforts by EDI, SC&A released 1/16/04 reports on INEEL, about five days prior to the INEEL Health Effects Subcommittee meeting scheduled for 1/21/04, and not enough time to review the reports containing thousands of pages.

This lapse of public outreach is indicative of CDC's lack of commitment to public involvement in its research findings. As of this writing, a random search of CDC's website document database does not contain relevant DOE/INEEL reports that EDI has copies of from Freedom of Information Act requests that are crucial to understanding ICPP source term releases.[5]

## B. Access to Historical Information

The most formidable obstacle to independent analysis of Department of Energy (DOE) operations is access to information. Reviewing the CDC Task Order 5 (TO5) (produced by Risk Assessments Corp.) on the Idaho National Engineering and Environmental Laboratory (INEEL) Dose Reconstruction Study and subsequent Sanford Cohen and Associates (SC&A) is an example of this fundamental paradigm. RAC's deficiencies in Phase I can be seen on EDI's website. The bottom line is CDC uses only the information it wants and structures the Task Orders accordingly to fit the agency's preconceived agenda to limit federal government liability to past misdeeds.

The veil of secrecy established at the beginning of the nuclear age continues to shroud INEEL's operations from the public's eye. Independent review of CDC's INEEL Dose Reconstruction Study reports are therefore fundamentally crippled from exercising the most basic of scientific processes required to validate any finding - equal access to the information so CDC's analysis can be replicated. CDC is not troubled by this secrecy paradigm and in fact is actively maintaining it. Under these circumstances, CDC cannot claim an unbiased scientific approach to its research.

For instance, in 1994, responding to EDI's inquires, CDC publicly announced that Operation Bluenose did not involve radiation releases and, therefore, was irrelevant to the INEEL

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[4] Environmental Defense Institute representative Chuck Broscious, as one of the original CDC INEEL Health Effects Subcommittee members through 1999, and author of the original 1990 Petition to CDC to conduct an INEEL Dose Reconstruction Study. Despite this EDI is not officially notified of new CDC report releases.

[5] CDC/NCEH has copies of EDI's FOIA requests, so exclusion of these reports from the agency's database appears to be arbitrary especially after EDI has cited these specific reports in official comments to CDC.

dose reconstruction study. CDC was later forced to recant this statement after censored FOIA documents received by EDI clearly documented that Operation Bluenose involved radioactive releases from INEEL and other sites. Another instance in 1997, CDC, DOE, and the U.S. Navy advocated against an Environmental Defense Institute and INEEL Health Effects Subcommittee (IHES) supported recommendation requesting an index of classified documents deemed useful by EDI as a check against CDC's request to DOE for declassification of documents relevant to the study. The agency's argument revolved around the "fact" that an index did not exist and extensive resources would be needed to create one and that it would not be useful in their view in a dose reconstruction study. In fact, CDC stated on the record that resources diverted to generating an index of classified documents would come out of DOE's budget allocations to CDC and therefore restrict CDC's health study. [See IHES meeting verbatim transcript 10/11/97]

After lengthy appeals, EDI FOIA requests produced the INEEL index of classified documents, and it was revealed that CDC had a copy of the index as early as 1992, but did not want EDI or the public to have access to it. These are but a few examples of how CDC actively blocks public access to information related to radiation releases from INEEL.

Since its inception in 1989, EDI has filed dozens of FOIA requests with DOE's Hanford and Idaho Operations as well as the U. S. Air Force related to radiation releases from INEEL. DOE launched numerous efforts to block EDI's FOIA requests starting with denial of fee waiver provided by law and attempted to impose copy charges of $1,200,000. When that tactic failed under appeal, DOE tried to deny the FOIA's on the basis that EDI did not have the technical resources to understand the information nor the ability to disseminate the information to the general public. That tactic also eventually failed on appeal. Finally, DOE, the Navy, and the Air Force (especially over Operation Bluenose releases) have hunkered down behind the "national security" barricade by claiming that release of these fifty-year-old secret documents on radiation releases would compromise this country's national security. Consequently, what few documents that are released under FOIA, have major sections missing and/or major portions are censored ("blacked") out. The censors claim that: "These portions contain information that remains currently and properly classified in the interest of the national security.... the authorized disclosure of this information could reasonably be expected to cause serious damage to the national security." [USAF 29 January 1999 response to EDI FOIA request]

Other censor tactics are blacking out page numbers so it is impossible to determine if the whole document was released. Still other censor tactics are to declassify a cover letter with deletions and not include the attachment that contains the important information. Of the 158 documents requested in EDI's 1998 "Bluenose" FOIA, only 41 have been declassified and those are heavily censored to the point of being useless. See discussion below on Operation Bluenose. Reviewing the Attachment below FOIA title listings can leave little doubt of the connection of Hanford and INEEL's involvement in Bluenose releases. CDC simply cannot bury its collective agency head in the sand and ignore this program in its INEEL TO5 analysis.

Given this piecemeal and at best sketchy access to information, it is nearly impossible for EDI to review the full range of operations at INEEL that may have resulted in major releases of radiation into the environment, which is the subject of CDC's INEEL Dose Reconstruction Study. Specifically, undue focus on the "RaLa" Runs as being the only "green" reactor fuel reprocessing program that released large quantities of radiation into the environment during the early years, is highly questionable. CDC acknowledges as much by stating: "Interestingly a high release of I-131 (about 50 curies) on Saturday, March 1, 1958 was not associated with a RaLa run and points out the difficulty of completely separating out the releases from the RaLa operations from other processing activities at the ICPP during that time." [CDC/RAC @20]

Green fuel is a term used to describe reactor fuel that has not "cooled" first before being reprocessed. "Cooling" in water pools allows short lived fission products in the fuel to "safely" decay before reprocessing. The popular term "RaLa" is a misnomer since the research, development, and production is centered around the isotope barium-140. **Ra**dioactive

**La**nthanum-140 is the daughter of barium-140 which was used in radiological warfare because it killed people through radiation exposure without destroying infrastructure. Based on limited documentation available to EDI, some 782,814 curies of Ba-140 produced at ICPP were shipped to Los Alamos during the production years of 1960 and 1961 [6] for open air radiological warfare tests. CDC states in its reports that this period was insignificant and therefore not analyzed. CDC/SC&A claims that "the RaLa product was used for diagnostic use" is patently false and intentionally misleading. [SC&A pg. 3-1] Other secret programs involving "green fuel" reprocessing occurred before, during and after the time of the RaLa Runs and therefore must also be analyzed.

### C. Document Destruction

During the study process in 1994, CDC's National Center for Environmental Health (NCEH) researchers identified over 15,000 documents or boxes of documents that may be relevant to the health study. The Department of Energy (DOE), through a formal Memorandum of Understanding (MOU), agreed to place the information under a destruction moratorium until after NCEH had completed its health study.

In the fall of 1998, NCEH requested physical retrieval of 4,948 boxes of previously identified documents from DOE's INEEL archives. DOE contractor Lockheed Martin responded to the NCEH's request by stating that 602 boxes had been destroyed and an additional 72 boxes were missing from the archive due to being "permanently recalled by the custodian", which is an obtuse way of saying the originator of the box of documents ordered the box sent back to them without leaving any copies or record of its current location. This potentially represents over 3 million pages of information that NCEH researchers will not have available to determine how much radiation was released from INEEL over its nearly five decade operating history.

John Till, Radiological Assessments Corp. (RAC) (NCEH Phase-II research contractor) believes "the issue of records being destroyed before we have had an opportunity to verify the contents is very disconcerting. This should not have happened, and shows that whatever system was supposed to be in place to prevent it, did not work."

The INEEL/Lockheed Martin December 1998 report, titled "Corrective Action Plan...." acknowledges the destruction of 602 boxes of documents that were identified by NCEH as pertinent (Pertinent 1,2,3,9). The report notes "359 boxes were destroyed as a normal course of business because they were not included in the list of frozen records schedules or had been lifted from the freeze by the DOE Historian. Forty-four boxes were destroyed because they were incorrectly scheduled as 'non-records,' and 199 boxes were destroyed because they were incorrectly scheduled in the past, reviewed and rescheduled using schedules that were not identified as frozen." [7]

The fact that the DOE historian was allowed to unilaterally override the NCEH freeze moratorium could be considered obstruction of justice if it were in the context of judicial proceedings.

At a December meeting in Salt Lake City of the INEEL Health Effects Subcommittee that advises NCEH on its INEEL Dose Reconstruction Study, NCEH only reported that 62 boxes of pertinent documents were destroyed and failed to quantify the number of boxes that had been recalled by their originators.

John Till notes that " we [RAC] have re-categorized a number of boxes from what they

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[6] CPP Production Weekly Reports, Ay-95-60A and Ay-3-62A.

[7] Denson, W.J., President and CEO, Lockheed Martin Idaho Technologies Co., letter to John Wilcynski, Manager U.S. Department of Energy Idaho Operations Office, Concern with Destroying Epidemiological records, December 4, 1998, cover letter for "Corrective Action Plan for the Continued Protection of Epidemiological Records at the Idaho National Engineering and Environmental Laboratory, December 8, 1998.

were categorized to be by [former contractor Sanford Cohen and Associates] SC&A. Therefore, I think it is important that no further boxes be destroyed until we have had a chance to verify their contents, even the category 9 boxes. I think it is critical that the Committee take stock in what has happened and weigh in to recommend some rules that should be followed. It should be recognized that document destruction may be necessary to continue, but not until everyone is absolutely certain what is being destroyed. ... [If] any boxes of records are to be reviewed during the cleanup process, they must not be destroyed until after they have been looked at. Further, it must be made clear that pert 9 documents from the SC&A review should not be construed as of no value until we have a chance to verify this." [8]

The issue of the 72 boxes permanently recalled is also crucial...and not fully disclosed by NCEH at an agency meeting in Salt Lake. DOE's statement that "There may still be available to some extent through the recall requestor or returned under another box" is equally bogus. First there is no record of who the recaller was or even that the box was recalled at all...it just is no longer in the archive. If it is returned in another box with another number it will go unnoticed unless NCEH/RAC does a new search. To date, there is no indication this has occurred.

INEEL does outline some "corrective actions" to enforce the moratorium on document destruction, however it is like closing the door after the thieves have looted the store. Also there is no assurance on DOE or NCEH's part to clamp down on other archives were INEEL related documents are housed (i.e. Federal Records Centers in Atlanta, Las Vegas, Chicago, Germantown, Seattle, and Hanford).

John Till stated that "The Seattle records center is a special situation which is becoming more problematic. There are quite a few pert 9 boxes there, and I do not want them destroyed either until we decide how to verify the contents of some or all of the boxes, depending on the strategy we take during the review. Hopefully we will have some information on alternatives that can be used at the next meeting. Things have gotten a bit frustrating over there."

A legitimate question to ask is: when did NCEH learn about the document destruction problem and what, - if anything, is being done about it? NCEH's Phase-I research contractor Sanford Cohen and Associates (SC&A) quarterly reports (October-December 1993) and (January-March 1994) acknowledge that document destruction is a significant problem area. [9] SC&A's draft final Phase-I report quantifies the document destruction at 65,000 boxes. Five years later NCEH is still sitting on their hands and not particularly concerned over the issue. [10]

CDC's National Institute for Occupational Safety and Health (NIOSH) is conducting a completely separate health study of the INEEL workforce. Document destruction is a major problem with this study as well. In a September 1993 protocol report, NIOSH states:"While stored files are no longer being destroyed under the DOE-ordered moratorium in March 1990, prior to its implementation approximately 11,000 boxes of INEL records had been destroyed. Many of these boxes contained information germane to INEL's operations during its earlier years, and the only way to compensate for their loss is by obtaining oral histories for each INEL facility from its long-term employees." [11] By sheer volume alone, the worker health study has a major

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[8] DERA; Report of the Dose Evaluation Review and Assessment (DERA) Advisory Panel, to the Idaho Department of Health and Welfare, January 1993, Review of INEL Dose Models and INEL Historical Dose Evaluation, Margaret von Braun, Ph.D., P.E. Chair, page 79.

[9] Britz, Wayne, Project Manager, Sanford Cohen and Associates letter to Leeann Denham, Project Officer, Centers for Disease Control and Prevention, Subject Quarterly Report, October-December 1993, page 10; Quarterly Report, January- March 1994, Contract No 200-92-0538, page 7

[10] Draft Identification, Retrieval and Evaluation of Documents and Data Pertinent to a Historical Dose Reconstruction At The Idaho National Engineering Laboratory, Revision 1, Prepared by S. Cohen and Associates, Inc for Centers for Disease Control and Prevention, September 2, 1994, page 3-13.

[11] Preliminary Protocol For An Epidemiologic Study of Workers at the Idaho National Engineering

document destruction problem along with the National Center for Environmental Health's dose reconstruction study.

This is not just another academic exercise. This is not equivalent to determining whether or not to put a new interchange on interstate 15. It is about determining why southeastern Idahoans had the lowest cancer rate in the nation during the first half of the century, and now in the second half of the century after INEEL's start up, the southeastern Idaho ranks up there with the polluted big cities. This is about the health and safety of hundreds of thousands of Idahoans who live in the shadow of that nuclear reservation. Idaho Division of Health studies around INEEL indicate increased rates of radiogenic diseases. The Tennessean newspaper conducted surveys of INEEL downwinders and generated a list of forty individuals with health problems that they believed were related to INEEL emissions.

Who controls the information needed to answer these basic accountability questions? Who is responsible for destroying the documentation needed to determine why Idahoans suddenly have such a high cancer rate? None other than the Department of Energy!

Who is paying NCEH's Radiation Studies Branch to conduct this INEEL Dose Reconstruction Study? Who is paying the National Institute for Occupational Safety and Health to study the health of the INEEL workforce? Who has the greatest liability exposure if a cause and effect is established? None other than the Department of Energy. Whoever controls the purse strings controls the outcome.

This system of health study funding has corrupted the credibility of the public health agencies. The U.S. Health and Human Services Advisory Committee on Energy Related Epidemiological Research (ACERER) is a national body that monitors the public health agency studies at DOE sites. ACERER recommended transferring the funding from DOE over to Department of Health and Human Services. ACERER's recommendation states:

"This arrangement is a vestige of a bygone era in U.S. history in which the research emphasis on all aspects of nuclear energy development - including the health consequences of radiation exposures - was primarily oriented toward national defense. The need for a robust health research program into the effects of ionizing radiation on nuclear workers and exposed communities continues. However, the arrangement for funding this research has proven to be inadequate and has outlived its usefulness."

"Under the current system, the agency (DOE) that inherited the weapons production and nuclear energy promotion responsibilities from the old Atomic Energy Commission is the recipient of virtually all of the federal funds spent on health research related to radiation exposures caused by past and present DOE activities. As such, the agency continues to exercise discretionary control over whether and how much funding passes through for this research. DOE's continued control over this research creates real or perceived conflicts of interest. In practice, funding transfers have neither been timely nor complete; in such cases funding that should have been provided hasn't been."

"The [CDC/ACERER] Committee believes that national security no longer requires that the nation fund health research into radiation-effects through such a system. Moreover, we believe that public expectations for a health research program that is removed from even the appearance of institutional bias are legitimate and reasonable. We also believe that a reorganization can be accomplished without weakening DOE's occupational protection and training programs. Likewise we believe this can be accomplished while maintaining under DOE's purview the environmental monitoring programs necessary for it to provide its own internal assurance that it is fulfilling its legal and managerial responsibilities to protect workers, the public and the environment. Therefore, the ACERER committee recommends that Congress, with deliberate speed, frame a new mandate for research on the health effects of ionizing radiation,

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Laboratory, Health and Energy Related Research Branch Division of Surveillance, Hazards Evaluation, and Field Studies, National Institute for Occupational Safety and Health, September 23, 1993

and that this mandate charge Health and Human Services with the primary responsibility for administering such research."

There are no guarantees that funding transfers will accomplish the desired unbiased commitment to good science in radiation health studies. However, it is a first step in a long journey that must be taken, otherwise there will be no journey toward the land of accountability. Recent biased radiation health studies by the National Cancer Institute are reminders that eternal public vigilance is a fundamental requirement of a participatory democracy. The only alternatives are large well-financed class action litigations that can afford independent research to establish cause and effect between radioactive releases and health outcomes.

In 1999, the Department of Energy (DOE) admitted to destroying an additional 700 boxes of documents identified by the Centers for Disease Control (CDC) as relevant to the agency's health study at INEEL. This is the second group of documents that the DOE has admitted to destroying. The first group, destroyed in 1998, was stored in Idaho at the INEEL site and involved a reported 600 boxes. This second announcement in June involved 700 boxes of INEEL documents stored at the Federal Records Center in Seattle, Washington.

CDC is conducting a dose reconstruction health study to estimate how much radiation was released from INEEL over its fifty-year operating history. The first step for CDC researchers is to review the historical operating records to determine what was released, how much was released, and when it was released. This process is made more difficult when much of the information is still classified secret and therefore can only be viewed by personnel with a "Q" security clearance.

DOE continues to drag its bureaucratic feet in declassifying all this information despite the fact that releasing it would not compromise national security because it only involves radioactive and chemical releases to the environment. The only conceivable national security issue at stake would be a diminished public confidence in the government's ability to manage nuclear operations in a way that protects public health and safety.

DOE claims that 667 of the 700 boxes destroyed were irrelevant "purchasing and contract records." In some cases the department claims to have been able to recreate the records from other archival sources. However, repeated requests for box inventories prior to destruction have not been produced. Consequently, there is no way of knowing if the "recreated" boxes are complete. Each box of documents could contain up to 5,000 pages of information. That means that if the 31 destroyed boxes (700-667) that even DOE acknowledges are relevant, it is equivalent to about 150,000 pages of information. Losing even one box of crucial records could compromise the health studies if it contained information on a significant release data.

CDC's INEEL Health Effects Subcommittee (IHES), a citizen group that advises the agency on its health study research, wrote letters to then Secretary of the U.S. Department of Health and Human Services, Donna Schalala, and then Secretary of the Department of Energy, Bill Richardson, asking that the documents CDC identified as relevant, be preserved. After this approach failed, the IHES issued a formal recommendation calling for a total moratorium on all DOE document destruction. It remains to be seen if DOE will comply despite the fact that it is required to under a Memorandum of Understanding between DHHS and DOE signed in 1996.

CDC in the meantime is keeping a low profile on the issue and generally doing damage control for DOE and claiming success in working with the department to "ensure the problems do not reoccur." As a federal public health agency, CDC does not have to report about government-sponsored disasters they do not know about because the records have been destroyed.

CDC gave DOE a list of all the documents in 1994 that the health agency wanted preserved for later analysis, however, that notification was not enough to save the information. Some of the destroyed documents included radiation emission records that are essential to quantifying radioactive releases to the environment.

Lockheed Martin's INEEL employee newspaper "*Star*" ran six articles between May 1997 and November 1998 describing a two-year campaign to clean out files. The article titled "Site-wide files clean-out a big success" notes that 13,231 cubic feet of documents were destroyed

in 1997 and 14,859 cubic feet were destroyed in 1998 for a total of 28,090 cubic feet over the two-year campaign. "It costs approximately $2,150 annually to maintain a single five-drawer filing cabinet in a local government office. Based on this last statistic alone, nearly $3 million in soft dollar savings may be realized by eliminating a total equivalent of 1,426 file cabinets worth of records and non-records."

It is uncertain if there is a connection between the Lockheed Martin file clean-out initiative and the documents CDC wanted preserved, but the coincidence is telling. Certainly, the eleven boxes CDC identified as relevant that were destroyed in INEEL office spaces may fall into this category.

DOE is non-committal in taking specific steps to preserve INEEL related documents at other archives. Of particular concern are Hanford reactor throughput records because in the 1950's and 1960's a considerable amount of highly enriched uranium fuel slugs were shipped to the Idaho Chemical Processing Plant (ICPP). These ICPP reactor fuel reprocessing campaigns are collectively known as the RaLa Runs and are the INEEL equivalent to the infamous Hanford Green Runs that released huge quantities of radiation into the air.

The issue of INEEL document destruction is at the crisis point. The CDC status report on documents relevant to the INEEL Dose Reconstruction Study reveals that some 1,254 boxes of documents have been destroyed or are otherwise missing. A single box could hold 5,000 pages, so the total loss of information could be in excess of 6 million pages. One of the issues is the CDC's document classification system of Pertinence 1, 2, 3, and 9 in descending order of relative importance to the INEEL Dose Reconstruction Study. To illustrate the problem, let us use the example of the previously discussed need for a physical reconstruction of ICPP source terms. Since CDC never intended to do a physical reconstruction of the ICPP, documents related to reactor power level, cooling time, emission control systems would not be considered a high priority (pertinence 1 or 2) document. CDC's delays of over eight years to conclude its Phase -1 document review has given DOE ample opportunity to destroy incriminating evidence. The problem is so acute, that it is uncertain that a credible study can be done even if CDC suddenly found the political will to do good science. The same problem will be faced by independent researchers working on a future INEEL class action suit, because the essential information simply may no longer exist. CDC additionally failed to secure documents once identified so that they would be later available for use in the health study. That is like farmer Brown telling the fox which chickens are the fat ones and which roost they are on before turning over the keys to the fox to guard the chicken coop.

Below is a CDC/RAC generated table that itemizes the various categories of INEEL related document retrieval operations discussed above.

| LOCATION | PERTINENCE | Phase I boxes (total) | Destroyed | Recalled | Reviewed | Remaining | Unable to locate | Total |
|---|---|---|---|---|---|---|---|---|
| ANL-W Bldg 752 Records Retention | 1 | 9 | 2 | | 7 | | | 9 |
| ANL-W Bldg 752 Records Retention | 2 | 7 | 3 | | 4 | | | 7 |
| ANL-W Bldg 752 Records Retention | 3 | 169 | 8 | | 161 | | | 169 |
| ANL-W Bldg 752 Records Retention | 9 | 344 | | | | 344 | | 344 |
| CFA Records Facility Bldg 674E | 1 | 218 | 12 | | 206 | | | 218 |
| CFA Records Facility Bldg 674E | 2 | 89 | 4 | | 85 | | | 89 |
| CFA Records Facility Bldg 674E | 3 | 574 | 51 | 4 | 517 | | 2 | 574 |
| CFA Records Facility Bldg 674E | 9 | 2707 | 556 | 37 | 4 | 2110 | | 2707 |
| LBC II | 1 | 1 | | | 1 | | | 1 |
| LBC II | 2 | 6 | | | 6 | | | 6 |
| LBC II | 3 | 2 | | | 2 | | | 2 |
| LBC II | 9 | 2 | | | 2 | | | 2 |
| NRF Bldg 627 | 1 | 148 | 7 | | 131 | | 10 | 148 |
| NRF Bldg 627 | 2 | 32 | 8 | | 24 | | | 32 |
| NRF Bldg 627 | 3 | 199 | 15 | | 175 | | 9 | 199 |
| NRF Bldg 627 | 9 | 96 | | | 11 | 85 | | 96 |
| Oak Ridge Operations Office Records | 2 | 2 | | | | | 2 | 2 |
| Oak Ridge Operations Office Records | 3 | 2 | | | | | 2 | 2 |
| Seattle National Archive Federal Records | 1 | 362 | | | 324 | | 38 | 362 |
| Seattle National Archive Federal Records | 2 | 443 | 48 | | 393 | | 2 | 443 |
| Seattle National Archive Federal Records | 3 | 5294 | 426 | 31 | 4804 | | 33 | 5294 |
| Seattle National Archive Federal Records | 9 | 2006 | | | 156 | 1850 | | 2006 |
| TAN 607 Records Storage Vaults | 1 | 59 | | | 59 | | | 59 |
| TAN 607 Records Storage Vaults | 2 | 2 | | | 2 | | | 2 |
| TAN 607 Records Storage Vaults | 3 | 34 | | | 34 | | | 34 |
| TAN 607 Records Storage Vaults | 9 | 253 | | | 1 | 252 | | 253 |
| | All boxes | 13060 | 1140 | 72 | 7109 | 4641 | 98 | |
| | Pert 1, 2, and 3 | 7652 | 584 | 35 | 6935 | 0 | 98 | |
| | Pert 1 | 797 | 21 | 0 | 728 | 0 | 48 | |
| | Pert 2 | 581 | 63 | 0 | 514 | 0 | 4 | |
| | Pert 3 | 6274 | 500 | 35 | 5693 | 0 | 46 | |
| | Pert 9 | 5408 | 556 | 37 | 174 | 4641 | 0 | |

## D. CDC Refuses to Include Credible Scenario for On-site Individuals in the Dose Reconstruction Health Study

A hotly debated question that has raged since DOE released its own INEEL dose evaluation report in 1990, has been what will be included in the CDC's dose reconstruction study. DOE calculated dose only beyond the INEEL boundary line. The State of Idaho's Dose Evaluation Review and Assessment (DERA) Advisory Panel 1993 report states, "Because the same models that will be used for the dose reconstruction can be used to estimate doses to workers, we strongly recommend that the proposed future dose reconstruction take advantage of this opportunity to clarify risks to all persons who have worked on the INEEL site including military, research and construction personnel. Omitting these dose estimates would provide an incomplete picture of health risks at the INEEL. Such estimates would also be useful for quantifying risks to members of the public who may have been on the INEEL property during releases." [pg.79]

CDC's National Center for Environmental Health (NCEH), however, initially refused to include people on the INEEL site in its dose reconstruction study. NCEH insists that it will primarily only include off-site populations. Only after considerable public outrage, did CDC reluctantly include a "regular visitor exposure scenario ... that assumed that an outside worker is present for a few hours each week at the Central Facilities Area. This exposure scenario refers to a delivery person who comes to a central delivery location (e.g., CFA) on a weekly basis and spends a few hours unloading his products." [12] This is not a credible scenario for a "maximally exposed individual" because of the reality of site service providers and is a deliberate attempt by CDC to limit exposure dose estimates for the following reasons. 1.) due to the size/needs of the INEEL, service providers have dedicated workers who are on-site full time on a daily basis; 2.) service providers (i.e., telephone repair, or beverage delivery person) go directly to and inside all the various operational sites on the INEEL, not just to the CFA; 3.) service workers may have a security badge but not a "dosimetry badge."

Given that INEEL is nearly 900 square miles, the size of the State of Rhode Island, starting radiation dose calculations at the boundary line guarantees that the doses will be significantly reduced. In other words, it is like saying that the residents of Rhode Island will not be included but the residents of Connecticut will be included. CDC's IHES advisory committee has been trying to change the agency's mind since 1997 to include those individuals closest to the radioactive and chemical releases, but to no avail.

Admittedly, another CDC agency, the National Institute for Occupational Safety and Health (NIOSH) is conducting an INEEL worker epidemiological mortality study which applies a totally different type of scientific methodology from NCEH's dose reconstruction study. The artificial fence-line boundaries should not be applied for the following reasons:

1. The INEEL is geographically the largest Department of Energy production site encompassing 890 square miles with a workforce at its height of over 12,000 individuals not counting service, concessionaire, researchers, visitors, and other individuals. Inclusion of these on-site populations will provide a more comprehensive and credible dose reconstruction study.

2. Inclusion of the on-site populations will not affect NIOSH's INEEL worker mortality epidemiological study. In fact, the two separate health research approaches (dose reconstruction and epidemiology) will provide valuable verification of the two-agency findings and thus reinforce the public confidence in the respective agency findings.

3. Only 40% of the INEEL workers were monitored with radiation dosimetry badges and even then only after they arrived at their work facility. Therefore, the dose received by workers during travel time to and from work over dozens of miles of site roads may not be covered in the NIOSH

[12] Draft Exposure Scenarios for Use in Estimating Radiation Doses to the Public from Historical Atmospheric Releases of Radionuclides at INEL, SENES, February 2003, page 17.

study.

The INEEL Health Effects Subcommittee (IHES) unanimously approved a letter in June to then CDC Director Jeffery Koplan, once again stating its recommendation to the agency for inclusion of on-site workers in NCEH's dose reconstruction study and to "include the combination of the Nevada Test Site, Hanford, and global fallout doses with the INEEL doses."

The IHES letter to Koplan went on to say, "The committee believes that there is a compelling public right to know not only what the dose received from INEEL activities, but also what the cumulative dose was from all domestic DOE nuclear operations. Moreover, the public is more interested in the cumulative dose than the individual site doses because of the impact on their health and safety. The committee respectfully expresses a degree of frustration that the NCEH has failed to provide substantive responses to the above recommendations, and therefore we appeal directly to you for resolution to this impasse."

CDC refuses to combine the doses from different U.S. nuclear radiation sources. [3/99,Transcripts] This intransigence persists since the concept surfaced after the dramatic revelations of radioactive fallout resulting from U.S. nuclear weapons tests. In 1998, Congress forced the National Cancer Institute (NCI) to release a nuclear bomb fallout study that the agency had embargoed for fifteen years. This NCI study showed that Idaho received more fallout than any other state including Utah and Nevada. The motivation on the part of public health agencies for withholding this cumulative INEEL-Hanford-Nevada Test Site dose information from the public is consistent with the motivation of the National Cancer Institute's refusal to release the Nevada Test Site nuclear bomb fallout doses. Two words describe the health agencies agenda - damage control.

The public health interest is clearly not a priority for the health agencies. Keeping the lid on a potentially explosive government liability is the top priority. Limiting the government's liability is task one today as it was fifty years ago. The INEEL Health Effects Subcommittee deserves considerable credit for withstanding the agency's onslaught and taking the issue directly to the CDC Director's door in Atlanta.

## E. CDC's Track Record at Hanford Thyroid Disease Study

Few government reports have generated as much scientific and public outrage here in the northwest as the CDC's Hanford Thyroid Disease Study (HTDS). This ten year, $18 million study was intended to determine if there was an impact on the downwind population as a result of some 739,000 curies of radioactive iodine-131 released between 1945 and 1963 from reactor fuel reprocessing at Hanford. In subsequent weeks after CDC's press barrage that "showed no relationship between thyroid disease and exposures to radioactive Iodine-131 released from the Hanford site," independent researchers started to unravel CDC findings.

CDC chose to ignore the January 18, 1999 National Research Councils' (NRC) negative peer review of the doses used the in study noting that the Iodine-131 in the milk consumed by children was based on highly misleading assumptions.

It should be noted that many of these challenges to CDC's dose estimates were generated by Harrimann and Harrimann in a technical report used in preparation for the Hanford Downwinder class action litigation that is slated for trial this year. This report showed that initial the doses used by the HTDS were understated by 400% in 1950, 300% for 1951, and 600% for 1952. Apparently more recent reports by Napier resulted in changes to the HTDS Hanford exposure estimates. This is the first indication of the extent to the scientific war of numbers that will soon be fought in court. CDC is already running for cover before the judge has even raised his gavel.

As reported by Karen Dorn Steele of the *Spokesman Review*, critics contend that, "Top CDC officials and their Seattle researchers exaggerated the HTDS negative findings, buried contradictory data, and released it January 28 in a way that caused maximum harm to Hanford downwinders."

CDC eventually admitted that there are mistakes in the Iodine-131 dose estimates and that the doses will all have to be recalculated on the 3,441 individuals in the study. The HTDS researchers

characterized the study cohort as containing a rough comparison between two groups. One group consisted of Columbia Basin counties closest to Hanford, and the other group consisted of Okanogan, Stevens, and Ferry counties further to the northeast of Hanford. Karen Dorn Steele notes that CDC's hypothesis was that the Columbia Basin counties closest to Hanford had higher Hanford-related radiation doses than the northern counties. Connor said, "The problem is, these were all exposed people."

Only a glance is required of the dispersion maps that show where the radiation went after leaving the Hanford stacks, to see that CDC deliberately chose counties all along the plume trajectory, and yet called them unexposed.

Another major problem that the HTDS failed to account for is the high number of sick and dead people as well as the elevated levels of thyroid disease. According to Steele, "Some 525 of the 5,991 people originally sought out for the study were dead - 20 percent higher than normal for a group of middle-aged people in Washington state."

In a joint February 18 letter to Dr. Richard Jackson, Director of the CDC's National Center for Environmental Health (NCEH), Tim Connor and twenty-one other individuals and organizations (including EDI) noted that, " We are writing to express our profound dismay and objections to the manner and process by which the results of the Hanford Thyroid Disease Study were released last month. The way in which the report was released showed a contemptible lack of sensitivity to the individuals whose personal well-being and family and community health have been, and continue to be, jeopardized by past exposures to Hanford radiation. Moreover, it is already clear that the substantive basis for the report's conclusions is dubious; that uncertainties about the accuracy of the doses assigned to study subjects should have been reconciled before such definitive conclusions were offered to the Congress, the press, and the public at large."

The Jackson letter went on to state, "Our grievance with the Hanford Thyroid Disease Study is that the conclusiveness of the study's findings are not yet warranted by the quality of the science. Officials and scientists at the Centers for Disease Control and Prevention had advance knowledge of these shortcomings and limitations. It is inexplicable that they failed to publicly disclose them. Furthermore, it is inexcusable that they did not seek to explain how the conclusions drawn in the draft report are, at best, premature."

The joint letter to Jackson adds that, "As the National Research Council's Committee on the Assessment of CDC's Radiation Studies concluded in a November 16, 1994 letter to CDC about a review of progress and plans for the HTDS: 'The committee's main reservations were that the statistical power, although adequate, is not outstanding, and that some questions about dosimetry remain unresolved.' When the results of the HTDS were made public on January 28th, the HTDS investigators reported, in the words of principal investigator Scott Davis, that 'it was important to point out, in considering these [results], the study is a powerful study.'"

"There was no discussion, by either the investigators or the CDC officials and scientists present during the briefings, about how the critical statistical power issues had been resolved, and whether CDC concurred that they had been resolved. Notably absent was any discussion about how uncertainties in the dose estimates could affect the confidence of the regression analysis (the critical dose response function).

"The most egregious omission, however, was the total lack of disclosure and candor having to do with the critical uncertainties in the doses assigned to individuals in the HTDS cohort.

"In a letter transmitted to CDC just 10 days before the HTDS was released, the National Research Council Committee on the Assessment of CDC's Radiation Studies, raised and emphasized problems with the uncertainties of individual doses calculated with the Hanford Environmental Dose Reconstruction methods used in conjunction with the HTDS study. '[I]t should be noted,' the Committee reported, 'that the inherent uncertainty associated with the individual doses will decrease the likelihood of determining a meaningful risk coefficient for the effects of radioiodine on the target population.'"

The joint letter says that, "It is appalling that CDC would go forward with the release of the

HTDS under such circumstances, and so quickly after its NRC review committee had identified such major problems.

"Unfortunately, it will be extremely difficult to repair the harm done to CDC's credibility as a result of this fiasco. It is simply hard to imagine that any community in America, concerned about environmental exposures to pollutants and subsequent health outcomes, would welcome CDC to come in and conduct, sponsor, or otherwise oversee an epidemiologic study. We are deeply troubled by this," the joint letter to Jackson finally concludes.

Tim Connor, Chairman of the Subcommittee for Community Affairs, Advisory Committee for Energy-Related Epidemiologic Research (ACERER), U.S. Department of Health and Human Services released the following resignation letter to Richard Jackson, Director of NCEH, distributed on June 25, 1999.

"Given the depth of my involvement and commitment to the ACERER over the years, I would be remiss if I did not comment on the events of the past six months which, in my view, have made serving on ACERER much more difficult than it had been previously.

"These changes caused considerable stress. They also, I believe, exacerbated a troubling decline in trust and morale between the Committee, citizen consultants and CDC staff. As I've communicated previously, the way in which the Hanford Thyroid Disease Study was released in January was a major setback. It is quite clear, by now, that the Fred Hutchinson Cancer Research Center was irresponsible in the way it over interpreted the findings of the draft study to proclaim, unequivocally, that the incidence of thyroid disease among people exposed to Hanford radioiodine is not influenced by these exposures. In their presentations before the NRC review committee last Saturday, [June 19] both Owen Hoffman and Dr. Jim Ruttenber offered convincing demonstrations that the statistical analysis of the HTDS results could not preclude the existence of a positive dose response between doses attributable to radio-iodine and the abundant cases of thyroid disease logged via the HTDS medical surveillance.

"My complaint for the past five months, and counting, is that CDC abdicated its responsibility with regard to how the draft HTDS findings were presented to Congress and the public. A decade ago I was one of the people who worked very hard to get this study funded by Congress through CDC. Our expectations, at the time, were that CDC would be primarily responsible to the public for assuring the quality of the study and for communicating the results. I'm grateful for the extension of the NRC review and trust that it will result in a thorough, objective evaluation of the science. I'll also concede that some of the changes CDC has made in its materials and public statements about the study over the past few months have been constructive. But the harm done in January--when the draft results of the HTDS made national news--was immense. The ill-founded message was a knife in the hearts of many Hanford downwinders and remains a source of inspiration for those in the American Nuclear Society and other nuclear industry proponents who would like to convince the world that low dose radiation is either harmless or therapeutic." Tim Connors' resignation from the ACERER Community Working Group must be recognized as a wake-up call to community activists and all those committed to good public health science.

### F. IHES Recommendations to CDC

The INEEL Health Effects Sub-committee (IHES) issued a recommendation to the Centers for Disease Control (CDC) to conduct a source term review of the INEEL RaLa Runs. At an IHES meeting in June, CDC officials indicated that they were moving forward with a RaLa Review and offered an outline of the methodology CDC intended to implement. Specifically, CDC intends to utilize DOE's stack monitoring data to quantify the source terms (what contaminates were released, how much was released and when they were released). Before launching into a discussion on this INEEL process, it is useful to review the Hanford Environmental Dose Reconstruction (HEDR) process and identify lessons learned by the public to question CDC applied "science" and questionable reliance on discredited DOE's radiation monitoring data of stack emissions. CDC's reliance on DOE

monitoring data is a "quick and dirty" and unscientific approach to avoid a detailed physical reconstruction of the INEEL emissions of the whole period.

### G. Hanford Environmental Dose-Reconstitution (HEDR) Source Terms Lessons Not Learned

Numerous major mistakes were made and continue to be made by CDC in the HEDR process to establish radiation doses to the affected public from the emissions from DOE's Hanford nuclear reservation. Since HEDR started some six years before the INEEL Dose Reconstruction Study, there are lessons to be learned so as to avoid repeating the same mistakes at INEEL and further undermining CDC credibility and wasting tens of millions of dollars of public resources.

Initially, HEDR's focus was on Hanford's startup of its plutonium processing plants in 1944 through 1947. This period is generally called the "Green Runs" because Hanford was processing fuel shortly after it was removed from the reactor and before it cooled in water pools allowing short-lived fission products like Iodine-131 to decay. HEDR estimated in the late 1980's that approximately 441,700 curies of I-131 was released between 1944 and 1947. This estimate was based on declassified stack monitoring documents released in a Freedom of Information Act request. Few people outside DOE and CDC believed these estimates because they were based on questionable data. Finally, years later, after significant public pressure, CDC sponsored a physical reconstruction of the Green Run period between 1944 and 1947. The 1992 revised estimate increased to 685,000 curies of I-131 released between 1944 and 1947. The key elements of the data needed for a physical reconstruction were:

1.) Cooling time of the fuel/slugs processed. Short cooling periods of hours or days rather than months means that short-lived isotope inventories such as I-131 will be much higher in the fuel.

2.) Release fractions. This figure is based on how much of the iodine present in the fuel is released to the environment. For Iodine-131, HEDR calculated the release fraction to be 90.5%.

3.) Reactor power levels of fuel used. A direct relationship exists between the reactor power level and the isotopes created in the fuel. The higher the power level, the more Iodine-131 is generated. [HEDR Technical Searing Panel (TSP) News letter, 12/92]

4.) Fuel type and percentage U-235/Pu-239 enrichment.

5.) Emission control systems accurately factored through the chronological history of the plant.

The partial physical reconstruction (1944 to 1947) was not extended to the 1948 to 1960 period, though HEDR estimates Iodine-131 releases between 1944 to 1960 at about 738,700 curies which produced a 870 rad exposure to an infant born in Ringold, WA in 1943 or 1944. [Hanford Education Action League, Connections(a)]

While working on the Hanford Downwinders class-action lawsuit, Owen Hoffman, President of the SENES Oak Ridge Center for Risk analysis, determined that approximately 900,000 curies of Iodine-131 were released by the AEC's Hanford plants between 1944 and 1957, a period including the Hanford "Green Runs." This amount is 150,000 curies more than the "official" estimates from the Centers for Disease Control. Hoffman's review focused primarily on the period between 1951 and 1960 because HEDR did not extend the thorough physical reconstruction into this period. He concludes that "the estimates of releases presented...for this period clearly represent severe underestimates of the actual releases." [13] Hoffman also notes that HEDR attempted to attribute

[13] Hoffman, F. Owen, *Evaluation of the HEDR Source Term and HTDS Power Calculations*, SENES Oak Ridge Inc., Center for Risk Analysis, March 1999. Also see email from Hoffman to Broscious 9/6/00. Hoffman adds, stack monitoring data can be fraught with uncertainty, especially if the samplers are inefficient and not isokinetic. I agree, the releases should best be based on process level modeling followed by environmental sampling of I-129 (to confirm the release fractions). Was RaLa the only source of I-131 releases at INEEL? At Oak Ridge it may not have been. I now think

emission control systems to processing plants many years before they were installed, thus underestimating the releases. This chronological error was also made with CDC's INEEL Phase-1 Report generated by Sanford Cohen & Associates despite protests by this author, and no attempt has yet been made to correct the errors.

### H. Public Frustration of CDC Methodology applied to INEEL

As of this writing, CDC apparently refuses to do a comprehensive review of the whole INEEL RaLa Run period much less a physical reconstruction of the INEEL RaLa Runs as part of the INEEL Dose Reconstruction Health Study because of "inadequate information.." [SC&A (2/03) @ ES-2] CDC is opting for the use of discredited DOE stack monitoring data. This is another deliberate attempt by CDC to understate the radiation release estimates in the hope that the government's liability exposure will be minimized. There are extremely important "lessons learned" from the Hanford studies that the public justifiably wants applied to the INEEL studies.

Documents relating to Hanford production reactors gained by the Environmental Defense Institute through Freedom of Information Act (FOIA) requests shows the elaborate logistical arrangement required for the RaLa Runs at the ICPP. "The short half-life of the RaLa product has important effects on RaLa procedure. Due to its rapid decay rate, Ba-140 concentration approaches saturation in "green metal" soon after the metal is charged in the reactor. For this reason metal shipped as RaLa is normally "green" metal charged on the last outage previous to the RaLa shipment. Due to the short half life of the RaLa product, rapid handling and processing of the discharged material is imperative. Once a reactor is shut down and metal is discharged for the RaLa program, this material must be shipped, processed, and forwarded to its destination as quickly as possible so as to minimize product depletion due to decay. For the same reason, the dates and times of the RaLa shutdowns are routinely adjusted to shipping schedules." [14]

Other Hanford documents quantify the amount of irradiated uranium slugs shipped to ICPP. For instance one report notes that between 11/54 and 4/56 200,000 J and C Slugs were shipped from Hanford to ICPP for processing. [15] Other reports put the shipping rates at 22 kilograms per month. [16] The point in emphasizing this discussion is the extensive involvement of the Hanford reactors in providing ICPP throughput and, to demonstrate the importance of this information in developing credible ICPP source terms via a physical reconstruction. To date, CDC is not showing any interest in utilizing this crucial information. [17]

Both INEEL and Hanford were reprocessing green reactor fuel using sodium hydroxide as a "caustic" to dissolve the fuel and chemically separate the uranium and plutonium. In the case of the INEEL RaLa Runs, lanthanum-140 or its decay product barium-140 was the production focus. At both sites there was little or no emission control systems in place to filter out the fission products like I-131 released to the atmosphere. "During this time, there were no filters on the stacks of the separations plants. Radioactive materials in the form of gases, vapor, and particles went up the

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that the total releases of I-131 were underestimated at Oak Ridge. At INEEL, the public health implications of exposure to releases of I-131 must consider the combined exposures to I-131 in Nevada Test Site and global fallout as well. In fact, worker exposures and risks should be considered along with those residing offsite.

[14] Scheduling RaLa Shipments, July 30, 1954, General Electric Company, Hanford Atomic Products Operation. HW-32594, HAN-56557

[15] See HAN- 53823, Shipment of Irradiated J Slugs from Hanford to Arco, 2/19/54.

[16] See HAN -52865, Forecast of Spent fuel Shipments from Hanford to ICPP, 12/1/53

[17] A review of CDC's data base of documents used in the INEEL study shows the absence of these Hanford reports. Also recently declassified INEEL ICPP reports gained by EDI through FOIA are extensively redacted (information blocked out) related to the RaLa Run period throughput sources.

stacks. The separations process primarily released large amounts of iodine-131, ruthenium-106 and ruthenium-103 along with other radioactive substances. Two radioactive gases emitted in the separations process, krypton-85 and xenon-133, contribute to radiation dose of a person stands in a 'cloud' of the gases. Plutonium is also known to have traveled off-site." [18]

Because these other isotopes (besides I-131) contribute significantly to the dose, they must be included in the INEEL source terms at the Idaho Chemical Processing Plant (ICPP) now called INTEC. The RaLa Runs must also **NOT** be the sole focus of ICPP source terms, but rather only as one of many "green fuel" separations campaigns. Therefore, the entire ICPP throughput must be subjected to a full physical reconstruction. Just as important, is the high-level liquid waste Calciner incinerator and other high-level waste evaporators must be included in the ICPP source terms. The first Waste Calcine Facility came on line in 1963 and ran through 1981 incinerating more than 4 million gallons of high-level waste. The New Waste Calcine Facility (NWCF) operated between 1982 and 2000 incinerating an additional 4 million gallons of high-level liquid waste. [19] Both Calciners to this day have never received the required RCRA hazardous waste permits because they could not meet emission standards.

Again, ICPP stack monitoring data is unreliable and must not be used in source term estimation. To further illustrate this point, Environmental Defense Institute, Keep Yellowstone Nuclear Free, and David McCoy have copies of internal INEEL reports gained through a Public Information Request, that acknowledge as late as 1996 that the required ICPP stack monitors were either non-existent or were turned off. This document further acknowledges that DOE is in violation of the Clean Air Act (NESHAP) regulations. [20] DOE generates emission release documents based largely on "process knowledge" estimates, not on actual instrument monitoring data and is therefore unreliable not to mention illegal.

CDC is defending its resistance to a full physical reconstruction at INEEL, by characterizing it as only a "screening" process to determine if the RaLa Runs deserve additional study. CDC, in the past, forgot that "screening reviews " were quick and dirty reviews and later called them credible source terms studies in the hopes that no one remembers the applied methodology. The public demands credible science from CDC, and the agency must understand that we will not suffer through the same bogus process demonstrated at Hanford.

CDC's Phase-I document data base and the RAC Task Order 6 database as well as the more recent (as of this writing) CDC database posted on the agency website was randomly checked for Hanford and INEEL documents related to the INEEL RaLa Runs and other ICPP fuel reprocessing. None were found using the website search engine. Even Dr. Till's instructions to look for MC- 71617 and MC-71618 documents, yielded search results that came up empty. This is yet another indication that information base for the INEEL Dose Reconstruction Study remains deficient. See Section III (B) Hanford Connection below for more discussion.

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[18] Hanford Health Information Network, *The Release of Radioactive Materials from Hanford: 1944-1972*, April 1993

[19] Idaho High-Level Waste and Facilities Disposition Draft Environmental Impact Statement December 1999, Vol. 4, C.9-11.

[20] DOE Notegram, July 25, 1996, to C. L. Tellez, from M. E. Feldman and T. A. Solle, Subject "Air " Legacy Issues

# III. INEEL Green Reactor Fuel/Slug Reprocessing

## A. Limited Information on Green Fuel Reprocessing

What few pieces of the puzzle Environmental Defense Institute (EDI) does have through incomplete Freedom of Information Act requests to DOE Hanford, INEEL and the U.S. Air Force contradict most of the CDC's Task Order 5 (TO5) and current SC&A findings. For instance CDC claims "there were about 78 separate [RaLa] Runs from 1957 through 1963." [CDC/RAC @19] Nowhere in the TO5 Report is there an apparent chronological listing of **ALL** the RaLa Runs CDC evaluated either in the report text or the CD Rom spread sheet tables. The most recent CDC/SC&A reports only acknowledge 31 RaLa runs. CDC provides an incomplete RaLa Run list in the "Routine Releases" spreadsheet under the section "Reported releases from the ICPP during RaLa Operations" however the list only shows releases by the month and year totals from February 1957 through December 1961. There is no explanation why 1962 and 1963 were not listed. CDC offers another Episodic "RaLa Run Releases" in a jumbled list of only 14 runs between February 24 1957 and February 6, 1959. Even combining these two lists leaves huge gaps in the RaLa history that CDC makes no attempt to explain. The spreadsheet tables offer no "legend" to explain all the acronyms and varying units of measure. Given the importance of the RaLa Runs, this TO5 reporting flaw makes it impossible to evaluate and/or replicate CDC's analysis. Even DOE's INEEL Historical Dose Evaluation (HDE) offered a chronological run by run listing of the RaLa history, which unfortunately is also incomplete because it starts in 1957, long after the RaLa pilot plant "hot" runs started in 1955. [21]

CDC states: "We compiled the daily reported releases of I-131 (and I-132 when it was reported) from March 11, 1957 through June 14, 1963 to determine the best approach to screening the releases from the ICPP during the RaLa Runs." [CDC/RAC@20] If this occurred, CDC offers no evidence of it, and again the start dates do not include the early RaLa Runs. Additionally, CDC offers no discussion of the reliability of the INEEL reporting of releases. When CDC misses such important radiation releases how can the public attribute any credibility to the entire report?

Phillips Petroleum, then operating the Idaho Chemical Processing Plant (ICPP), whose documents were gained through EDI FOIAs, reported extensively about "hot" RaLa Runs as early as November of 1956. [PTR-185] There were at least five RaLa Runs between November 1956 and the following February 1957, when CDC claims RaLa started. These early runs released more Iodine-131 than later runs and therefore must be included in CDC's analysis. Pilot plant, and cold fuel RaLa Runs are understandably not included.

In INEEL Phillips reports that covered the first five runs in detail note that these RaLa runs produced 118,033 curies of Ba-140 product that was shipped to Los Alamos from processing green fuel containing 243,840 curies of Iodine-131. The reports also note: "There are indications that considerable iodine activity passed through the scrubber. Smears indicated the presence of iodine in the stack. AEC site surveys indicated that local rabbits showed significant increases in thyroid radiation count immediately following Runs 3, 4, and 5. Since gases from the runs were not collected and sampled it is not known how much activity was discharged from the stack. If known, this amount would raise the Runs 3, 4, and 5 iodine balances." [PTR-185 @19]

The last RaLa Run appears to be in April 1963. Documentation on this of the above-cited information was available to CDC since the May 1998 when the agency received a copy of EDI's Citizens Guide to INEEL. [See Guide at 30] If Phillips was uncertain about the accuracy of Iodine releases, CDC should not rely on the Phillips recorded data in its assessments.

One 1955 Phillips "RaLa Pilot Plant" report states: "RaLa, MTR-B, MTR-RaLa, and DORP are synonymous terms used by various sites to designate barium-140 production. The term 'RaLa' is

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[21] IDO-14364, Technical Progress Report for July through September 1955, May 1, 1956, Phillips Petroleum.

an abbreviation for Radioactive Lanthanum-140 which is a decay product of barium-140. RaLa as used in this report refers to all phases of barium-140 production from development to actual productions facility operations." [IDO-14344@10] This quote could suggest the undue reliance to the reference "MTR" in terms of it being generic RaLa and not necessarily directly tied to the Materials Test Reactor fuel.

**B. The Hanford Connection**

CDC dismisses Environmental Defense Institute's (EDI) contention that there was a Hanford connection with the ICPP RaLa process. The TO5 report states: "We searched for and reviewed documents from Hanford and the INEEL for information to clarify Hanford role. The historic record clearly shows that Hanford shipped fuel slugs to the INEEL regularly. On Jan 14, 1952, a Hanford memorandum indicated that the INEEL had asked if Hanford could be able 'to can five hundred ten simulated J slugs for cold runs during the start-up of the ICPP....these records indicate that fuel was shipped to the INEEL but after it had been cooled for weeks or months. Fuel for the RaLa runs was cooled at the most for about 2 days to limit the decay of Ba-140. These record reviews indicate that Hanford did not supply fuel elements for the RaLa processes at the INEEL." [CDC/RAC@20]

General Electric, then Hanford's primary contractor, released a report "Scheduling RaLa Shipments" that established a precisely coordinated effort between production, shipping, processing, and Atomic Energy Commission's Los Alamos bomb test schedule. The report states in part:

"A new procedure for scheduling RaLa shipments has been adopted by the Reactor Section. It establishes a method for the consideration of RaLa cost factors and makes possible the selection of RaLa material under exact optimum conditions." "Since the half-life of RaLa (40 hours is considerably shorter than that of the parent Ba-140 (12.8 days), the RaLa decay rate becomes approximately equal to its formation rate (or the Ba-140 decay rate) which in turn is dependent on barium concentration. Therefore, the concentration of RaLa is directly dependent on the concentration of the parent Ba-140; and barium content is used as the basis for the entire RaLa program. The short half-life of the RaLa product has important effects on RaLa procedure. Due to its rapid decay rate, Ba-140 concentration approaches saturation in 'green metal' soon after the metal is charged into the reactor. For this reason, metal shipped as RaLa is normally 'green' metal charged on the last outage previous to the RaLa shipment. Due to the short half life of the RaLa product, rapid handling and processing of the discharged material is imperative. Once a reactor is shutdown and metal is discharged for the RaLa program, this material must be shipped, processed, and forwarded to the destination as quickly as possible so as to minimize product depletion due to decay. For this reason, the dates and times of RaLa shutdowns are routinely adjusted to shipping schedules. Requests for RaLa shipments are received in the form of a specified amount of RaLa product to be shipped on a certain date. Amounts requested are specified in curies. Sufficient additional product must be shipped to allow for decay so that the specified amount will be obtained as final product following the separation process. The Production Scheduling Group of the Reactor Section is required to interpret and comply with this request under conditions of optimum economy as follows: 1.) Schedule a RaLa shutdown at one of the reactors on the shipping date specified by the AEC. 2.) Schedule the discharge of certain regular metal tubes, and designate certain slugs from these tubes to be shipped as RaLa material. 3.) Perform the administrative functions of accountability, coordination, and revision of the Reactor Section outage schedule as necessary to accommodate the shipment. Evaluating the terms appearing in this equation [for determining how many slugs to ship], the quantity X is specified. **One week of decay time is allowed for shipment and separation, fixing $t_2$ at 7 days.** (If for any reason the shipment is not made immediately on the shut-down day, additional decay time is allowed accordingly.)" **"The [Non-Hanford] off-site separations cost should be included in cost considerations;** however, necessary data has not been available and therefore

RaLa shipments are being scheduled on the basis of minimum [Hanford Atomic Products Operations] HAPO cost." [HW-32594 or HAN-56557] [22]

EDI has copies of about fourteen heavily censored declassified Hanford documents, dated between 1953 and 1958, that report on over 274,000 irradiated enriched uranium slugs shipped to the ICPP, also called Arco because of the proximity to the town of Arco to INEEL. One 1955 General Electric Hanford Atomic Products Operation (HAPO) report titled "Shipment of 'J' Slugs to Arco" states: "Hanford will have irradiated J material on hand to permit shipments to resume on March 3, 1955. Presently there are approximately 700 extruded J slugs in the Hanford reactors these slugs will be identified and shipped to Arco separate from the cast material. **The reference letter states that a maximum of six hours will be allowed for unloading, loading, and decontaminating of the four casks without a delay penalty. It appears feasible to complete this work, under ideal conditions, within the allotted time; however delay penalties would be expected.**" [HW-35520] Why the tight schedule and "penalties" if there was not a product decay factor (Ba-140 half-life of 12.9 days)?

Other 1958 Hanford documents describe an extensive transportation system of two Garrett Freight Line flat bed truck convoys with each truck carrying two casks for a total of four casks each shipment. These convoys were in constant circulation between Hanford and Arco leaving every Monday and Thursday. [HAN-68946] "The first shipment of irradiated C slugs is scheduled to leave Hanford on Monday, March 29, 1954, and will arrive at Arco on Tuesday, March 30. This will result in four buckets [casks] being loaded at Hanford, four buckets being unloaded at Arco, and four buckets in route at any one time." [HAN 54108] Another 1955 Hanford report states: "The trucks will be available at Hanford at 8am on Monday and Thursday mornings for unloading, loading, and decontaminating the four casks. **A maximum of six hours will be allowed for this work without incurring a delay penalty.**" [HAN-58025] Again, what is the rush and resultant penalties for delays if product decay was not an issue?

Hanford was heavily involved in not only in sending irradiated enriched uranium slugs to Arco (INEEL), but tracking the releases that resulted from the ICPP reprocessing of Hanford slugs. A 1956 General Electric report states: "It has been Idaho's policy to send us reports of dissolution of Hanford slugs only for those months in which Hanford slugs were dissolved. As a consequence, we are not in a position to state authoritatively, but only by inference, that there have been no releases during a given month, until the next report of dissolution is received." [HAN-63584]

A heavily censored INEEL Phillips Petroleum "Gas Release Report" to the AEC notes: "The Hanford NP material charged to the ICPP dissolution equipment during the month of August 1956 is listed in the attachment to this letter. The gas plant was in operation during August and the amount of Kr-85 collected is reported in the letter giving Kr-85 production as calculated from the chemical measurement data, isotopic distribution, and irradiation history." [HAN-63688]

Numerous 1956 Hanford documents titled "Reporting Bluenose Releases" [HAN-63688] based on "reports on the dissolvings [sic] at the ICPP" make the undeniable connection between Hanford slugs and INEEL's participation in Operation Bluenose intentional radioactive releases, which switched from Iodine-131 to Krypton-85 releases. See Attached Bluenose Discussion for more information. 1958 ICPP reports specifically show Hanford "C" slugs as process throughput. [PTR-279, page 6]

CDC's report apparently does not acknowledge Operation Bluenose in its TO5 report, and therefore cannot be considered as an adequate review of INEEL operational releases to the environment. Whether or not Hanford slugs were used in the ICPP RaLa Runs or other "green fuel" reprocessing programs at the ICPP is important because if CDC is forced to do a physical

[22] HAN-56557, Scheduling RaLA Shipments, 7/30/54. Also see INEEL/CPP reports IDO-14310, IDO-14314, IDO-14323, Ay-60-62A, Ay-49-61A, PTR-70, PTR-109, that specifically refer to ICPP processing of Hanford fuel and/or slugs.

reconstruction of the ICPP releases (such as what eventually occurred with the Hanford Dose Reconstruction Study), then the irradiation history of the fuel burn-up and reactor power levels will be needed. That documentation must be collected and preserved for that future research. See Section below Estimating ICPP Source Terms.

Numerous ICPP processing reports acknowledge Hanford slug throughput. [23] Unlike spent nuclear fuel that has a "cladding" around the uranium core, irradiated cast or extruded "slugs" have no cladding, and therefore are difficult (especially when "green") to store since they cannot be interred in water storage pools. Given the highly scheduled Hanford green slug transportation system to ICPP, it is reasonable to assume that they were processed immediately upon arrival at the ICPP.

Attachment A below shows EDI's FOIA request for Hanford documents related to INEEL that remains unfulfilled principally due to US Air Force objection on national security. A cursory review of the document titles clearly show a symbiotic exchange of irradiated material sent from Hanford to INEEL as well as the two sites involvement in Operation Bluenose.

### C. Inadequate CDC Information Included in INEEL Study

CDC's use of a CD Rom to provide substantiating data in support of the written text of the TO5 Draft Report has the potential to be very useful. In its present form however it is of little use given that there is no apparent index provided either in the written report or on the CD that offers the reviewer a "road map" with the appropriate and essential explanation of what is in each of the files and "legends" explaining what the spreadsheet columns represent. Most spreadsheet software offers the capacity to show headers and/or footers to explain the contents of the file. One is left with a laborious process of "trial and error" going through each individual file to distinguish the purely data files from summary files. Even when a summary file for a given release event is located, one finds huge release event gaps where there is no apparent explanation for the gaps. Some summary files offer total release numbers while others do not. An extreme example of this deficiency is in the SPERT and SNAPTRAN files in the CD. These were major release events that a reviewer is left scratching his head wondering how CDC incorporated the data into the overall analysis.

The excessive decay time and distance assumptions used in calculating the doses go to the very heart of violating IHES's fundamental requests and independent critics of DOE Historical Dose Evaluation (HDE) for using the INEEL fence line as a critical means of reducing the dose to the "unbadged" soft drink and phone repair person in the immediate vicinity of the release.

EDI applauds the constructive criticism offered by IHES members Al Tschaeche and Doug Wells especially related to the inappropriate use of NCRP 123 methodology to estimate episodic release doses when the NCRP has specifically articulated that the model is not intended for accidents. Additionally, Dr. Peter Richards critique puts the spotlight on numerous other deficiencies of the TO5 Report that EDI supports.

CDC's website on INEEL Dose Reconstruction does not offer the most current SC&A document data base or links to the document data base used in their studies. This is a serious block to independent researchers evaluating the TO5 and SC&A reports because it is the fundamental informational basis of the report. The database is posted but separately and not linked to the main INEEL website and links provided to the database limit access to CDC designated parties (EDI was excluded). The point is that it is not readily accessible even to this researcher who failed to access the INEEL document database after repeated attempts. Peter

[23] See IDO-14310, pg.20, Phillips, September 16, 1954; and IDO-14314, ICPP Monthly Report, October 12, 1954. IDO-14383 notes the slugs are about 9 x 1.5 inches. Seven runs between October/December 1955, page 31; IDO-14364, Technical Progress Report, ICPP, July-September 1955, shows seven runs of cast/extruded slugs, pg 13.

Richards later supplied the website address not provided by CDC.

A random search of the CDC document data base of their website revealed that none of the documents cited in EDI's analysis were in the data base as EDI previously noted when the data base was first released. CDC has a scientific obligation to explain these major discrepancies and why documents EDI has revealed are not in the database. The CDC database search engine is fixed to predetermined categories, which is not useful if a person is seeking documents related to a particular program.

The serious problem of document destruction is not apparently mentioned in the TO5 or current SC&A reports, and therefore represents a major deficiency. For more discussion of the issue see Attachment below.

CDC's states that "The release data measured since the mid-1970s were of good quality and may be sufficient for dose reconstruction...."[RAC/TO5@i] This is an absurd statement especially in view of revelations of INEEL contractors falsifying radiation reporting documents. [See Mock/Lebow v. Lockheed] CDC's statement that tritium is the only radionuclides detected beyond the INEEL border is false given that Iodine-129 was detected in two USGS wells seven miles south of the border. [RAC/TO5@ i&51] The choice of Route 20 as an "on-site" location does not meet the IHES recommendation of un-badged phone repair person at the release location. CDC appears to have overlooked the ICPP 10/58 criticality that released 1,200 curies. [ERDA-1536] The report states that the primary release sources were reactor and reprocessing operations fails to recognize the major release source of the Calciner high-level waste incinerator.

**D. Adequate Public Review Blocked**

The whole process of substantive public review of CDC's INEEL Dose Reconstruction Study remains perverted by the continued secrecy and blocks to FOIAs by individuals and public interest organizations. Limited "Secret" declassified documents received by EDI through FOIA have major portions redacted (blocked out) presumably for national security reasons, despite the fact these reports are forty or fifty years old and could not possibly impact current national security. [24] CDC is making no credible effort to change this untenable restriction to the essential information needed to verify the agency findings. CDC, as previously stated, actually is actively engaged in blocking public access to the relevant information. Additionally, CDC is making no effort to safeguard relevant documents so that they are not destroyed by DOE and its contractors.

EDI was involved in the early years of the Hanford Environmental Dose Reconstruction (HEDR) and in later years an avid tracker, and has discovered that there are lessons to be learned. Initially, DOE and contractor Bechtel (Pacific Northwest Labs)(PNL) did all the Hanford source terms for the health study. Public confidence justifiably deteriorated claiming DOE could not investigate itself. The early PNL Green Run reports were summarily dismissed by the public. Subsequently, a physical reconstruction of the Green Runs was conducted which resulted in a 70% increase in Iodine-131 Green Run releases. Public distrust continues on the HEDR studies, and ultimately resulted in large class-action suits against DOE that are still being litigated. My discussions with the technical consultants for the Hanford plaintiffs suggests dramatic increases of the Hanford releases.

A similar process is occurring at INEEL where CDC is reviewing DOE's INEEL Historical Dose Evaluation. Public skepticism is again justified when CDC fails to incorporate public and INEEL Health Effects Subcommittee recommendations. For instance, the proposed (quick and dirty) review of the RaLa runs at INEEL will again be summarily dismissed by the public unless a comprehensive physical reconstruction is conducted. This means: 1) documentation of the fuel type and composition; 2.) the power level of the reactor the fuel was interned in; 3.) the cooling

[24] See CPP Production Weekly Reports series starting with Ay-31-60A.

time between when the fuel was removed from the reactor and when it was reprocessed; 4.) the emission control system in place at the time, to establish the release fractions. Repeating the failed DOE efforts of the past at Hanford will only further entrench public opposition to the proposed RaLa Run review. The message to CDC is "do it right the first time"; do not repeat the mistakes of the past at Hanford.

On the whole, CDC Task Order 5 report contains fatal flaws that if not corrected will lead to even greater distrust and public recognition of the lack of the federal government's ability to investigate itself. Class-action lawsuits against DOE and its INEEL contractors are inevitable. If the Hanford scenario is repeated at INEEL, the independent scientists hired by law firms representing downwinders will again show CDC's political modus operandi dominated over credible science.

### E. Operation Bluenose Releases

The old adage "what you don't know can't hurt" does not apply to toxic radioactive substances released into the environment by the United States government during secret military operations. Radioactive contamination to the air/water and general environment cannot be detected without dedicated instruments (ie, you can't smell, taste or otherwise know you are exposed). These releases continue to affect the health of tens of thousands of Americans living in the shadow of nuclear weapons' production and testing sites.

This section explains what is currently known about one such military discharge program of radioactive substances. The information within it has been gleaned from EDI's reading of hundreds of U.S. documents released under the Freedom of Information Act (FOIA). Many more documents remain "classified", however, and continue to be shrouded by a cloak of secrecy. See previous discussion on censored FOIA documents. The U.S. government's insistence that documents over forty years old pose a threat to national security does not meet the giggle test much less the most basic test of an open democratic society.

In the late 1940's and 1950's, the United States Atomic Energy Commission (AEC) and the Air Force implemented a secret program code-named Operation Bluenose. The program's objective was to determine the Soviet Union's plutonium production levels in order to evaluate the extent of their nuclear weapons' capability. The general idea behind Bluenose was to analyze fission-product gases released into the atmosphere during the Soviet Union's reprocessing of reactor fuel.

Although the Air Force had developed a high altitude spy plane, called the U-2, that could overfly the Soviet nuclear production sites and conduct reconnaissance, it wanted to verify not only that the Soviets were producing plutonium but how much was being produced. To accomplish this, the Air Force had to refine the fission air sampling process using the U-2 planes. Operation Bluenose was created to achieve this goal.

In order to correlate fission product sample data with what was being produced on the ground, a simulated experiment was needed. The solution: run the U.S. nuclear production plants "Soviet style" and overfly them with U-2's. Since the AEC knew the U.S. plutonium production rates for each plant on an hourly basis, the monitoring sample, collected by the U-2's flying at 100,000 feet, could be correlated to a specific production rate.

To run the U.S. plants "Soviet style" required some adjustments to the differences between Soviet and U.S. plants. In the rush to catch up to the U.S., the Soviets were saving time by reprocessing "green" reactor fuel, as opposed to first cooling the fuel for a year before reprocessing. Cooling the fuel in water pools after extraction from the reactor allows short-lived fission by-products, like the highly toxic Iodine-131, to safely decay so less is released into the environment. In the early years of the nuclear arms' race, both countries reprocessed "green" fuel; however, the Americans installed some minimally effective filters to reduce emissions and gradually increased the fuel cooling time, except for secret projects like Operation Bluenose.

These projects benefited from the release of large amounts of fission by-products and thus allowed the U-2's to more easily calibrate the air sample with the amount of nuclear fuel being processed on the ground.

This is clearly revealed by documents gained through FOIA in 1986 by the Hanford Education Action League. These documents describe how, in an effort to satisfy military intelligence needs, the AEC recommended that other tests be conducted at Hanford that would release more radiation and also asked that plant filters be disconnected. Clearly, the AEC was trying to simulate at the U.S. plants was happening in the Soviet Union by processing "green" fuel. The move to "green" fuel was also done for nuclear processing runs at Oak Ridge, Tennessee and the Idaho National Engineering and Environmental Laboratory's (INEEL) so called "RaLa Runs" during the 1940s and 1950s, despite the consequences of increased radiation releases to the public health.

Based on research for the Oak Ridge National Laboratory Health Study, scientists also believe the RaLa Runs that originated at Oak Ridge and later moved to Idaho are underestimated by the public health agencies. Apparently these releases have been revised. Although the RaLa Runs processed green reactor fuel/slugs for a different purpose, to extract isotopes used for AEC radiological warfare experiments, they were also used by the Air Force to meet the needs of Operation Bluenose to develop monitoring track system to determine the Soviet Union nuclear weapons production program.

The Ra La program was transferred from Oak Ridge to INEEL where similar huge releases of radioactivity occurred. Operation Bluenose, the Hanford Green Runs, and the INEEL RaLa runs, conducted between 1954 and 1963 were distinctly separate programs. The Air Force, however, opportunistically used them all in their Bluenose overflights.

Initially, the U-2 planes sampled for Iodine-131, but in later years, switched to Krypton-85 as the "signature of reprocessing" because it dispersed into the stratosphere where the U-2's were forced to fly to avoid being shot down by the Soviets. The switch to Krypton-85 has been confirmed in the partially declassified Operation Bluenose documents, obtained under the FOIA. From a public health perspective, Krypton is not as toxic as other fission by-products. However, its releases are indicative of large concurrent iodine, strontium, cesium, and dozens of other highly toxic radionuclides that do pose significant public health hazards. By knowing the Krypton releases, it is possible to estimate the amount of iodine and other fission product releases. Therefore, this information must be fully declassified to meet the public's right to know what pollutants were released.

The environmental emissions data on Operation Bluenose, Ra La, and other secret military programs remain classified forty years later despite public demands for full disclosure. The importance of declassifying this information lies not only in the public's right to know what they were subjected to without their consent but also in establishing the government's liability to compensate those who suffered from radioactive releases.

Robert Alvarez, former senior Department of Energy (DOE) policy advisor, claims that the rationale for keeping radiological release data classified on the grounds that it could be used to estimate U. S. plutonium production is no longer valid and a clear-cut abuse of secrecy. Arjun Makhijani, head of the Institute for Energy and Environmental Study, agrees, adding that U.S. plutonium production rates are publicly known because of treaty disclosure requirements. Clearly, the refusal to declassify emission data cannot be supported on the basis of national security.

David Albright, Director of the Institute for Energy and International Security, is a member of DOE Secretary's Openness Advisory Committee. He thinks that continuing to classify the Iodine and Krypton releases is an unwise policy. According to Albright, no single individual DOE or Air Force declassification officer should decide what radiation emissions to declassify and what to keep secret. Albright also contends that the amount of Krypton released is known. Frank Von Hipple conducted a publicly available study for the International Atomic Energy

Commission (IAEC) for all nuclear production facilities worldwide. The IAEC developed its own Krypton tracking system to verify zero nuclear bomb production under the Nuclear Non-Proliferation Treaty. Despite the IAEC disclosures, the information is not detailed enough to isolate individual nuclear production site releases, information vitally needed to establish the amount of radiation released for specific plants during specific periods. Dose reconstruction health studies require fission by-product environmental release data from a specific nuclear plant, sometimes on an hourly basis, so it can be merged with meteorological data, thereby, allowing scientists to determine what pollutant went where and who was affected. This is why detailed operating history and throughput of each nuclear production plant must be declassified.

Secret document title lists, obtained during the Hanford Environmental Dose Reconstruction Study, confirmed that the INEEL was involved in Operation Bluenose in the 1950s. Starting in 1991, the Environmental Defense Institute filed FOIA requests to DOE Hanford INEEL and the U.S. Air Force for documents related to the Bluenose project. Although Hanford sent eight of the twenty-eight documents requested, portions of these reports were "blacked out" or otherwise censored because, according to the government, release of this information "would compromise national security." The data quantifying radioactive releases were blacked out as well as page numbers, so it is impossible to determine if pages were deleted and what the magnitude of the release was. The U.S. Air Force retains primary control over declassifying these secret documents, and to date they refuse to allow DOE to release them even under FOIA.

The CDC is currently conducting an INEEL Dose Reconstruction Health Study to determine what radioactivity was released from the site over its operating history. Although it would seem as if the government is doing all it can to answer the public's questions, history proves otherwise. As a six year member (during the early years) of CDC's INEEL Health Effects Advisory Committee, EDI was shocked when, in 1994, the CDC publicly announced that Operation Bluenose did not involve radiation releases and, therefore, was irrelevant to the dose reconstruction study. CDC claimed that Blue Nose involved shipments of small amounts of material between DOE sites. CDC was later forced to recant this statement after censored FOIA documents clearly demonstrated that Operation Bluenose involved radioactive releases from INEEL.

The CDC also blocked its own Advisory Committee from recommending that DOE release an index of classified INEEL documents (it was the Hanford index that first disclosed the existence of Operation Bluenose). The INEEL index was the only way the public could independently determine if the CDC was accessing all relevant information needed to establish the INEEL radioactive releases, particularly, Operation Bluenose and the Ra La Runs.

CDC's contractor confirmed that in October of 2000, approximately 1,254 boxes of documents related to INEEL's radiological releases were destroyed. These boxes, archived at INEEL and the Seattle Federal Information Center, contained millions of pages of information that has been lost forever. Hanford also acknowledged twenty-seven "lost" (or perhaps destroyed) Bluenose documents. The DOE''s systematic destruction of this information means we may not have anything substantive left to uncover under the Freedom of Information Act; the American public may never know the whole truth. Allen Benson, author of *Hanford Fallout*, the first comprehensive analysis of the Hanford Green Runs says no federal agency can be trusted to tell the truth about U.S. radioactive releases. As a scientific consultant on the Hanford Downwinders class action suit, Benson believes that the only hope lies in well financed litigation that can bring in independent scientists to reveal, through court ordered discovery, what harm the public was really subjected to from the government's negligent actions.

Operation Bluenose is only one of dozens of major nuclear releases to the environment that caused serious harm to those living downwind of this nations' nuclear weapons' production facilities. Continued denial of federal agencies to declassify information needed to reveal the truth about what hazards we are being subjected to without our consent is a travesty of democracy.

The only national security issue at state here is the American public's shattered confidence in our government's willingness to put health and safety above minimization of liability for past negligence.

# IV. Estimating ICPP Source Terms at INEEL

## A. Background of ICPP RaLa Process Runs

The RaLa fuel process runs at INEEL's Idaho Chemical Processing Plant (ICPP) produced "Radio-iodine which can also be released under certain conditions amounts to 50,000 to 100,000 curies." [IDO-14532@13] According to DOE's own assessments, the highest radioactive release period - over half of the total - occurred between 1956 and 1966 and amounted to 15,256,015 curies to the atmosphere. [ERDA-1536, p. III-7] [DOE/ID-12119 @A 55] [25]

The Idaho Chemical Processing Plant (ICPP) conducted 11 process runs in 1953 for the capture of Krypton-85 and 113 process runs between May 1954 and February 1963 to recover Barium-140, Uranium-235, and **Lanthanum-140** for the radiological/chemical weapons program. These isotopes were produced for Atomic Energy Commission's Los Alamos National Laboratory. RaLa was used to produce material which Los Alamos used as a "substitute" for plutonium in certain types of radiological weapons tests. Barium-140 and its daughter product Lanthanum-140 shared many of the physical properties of plutonium and could be used to disperse deadly fission products without destroying infrastructure. With a shorter half-life of twelve days it did not permanently contaminate the environs the way plutonium would with a half-life of 24,000 years. As previously discussed CDC incorrectly states that this Ba-140 product was only used for "diagnostic use." [SC&A (2/03) page 3-1] This is a clear indication of CDC's bias and compromised "science." So, Ba and La-140 were a people killer weapon, not a building leveler that the nuclear priesthood at Las Alamos was developing and testing on the residents of New Mexico.

"The government moved the RaLa project to Idaho from Oak Ridge, Tenn. because of concerns over the iodine releases connected with the processing "green fuel." The Oak Ridge plant was within five miles of the nearest site boundary, said [John] Horan who worked at the Tennessee facility during the early 1950s." [Times News(f)] In fact, a RaLa run blew up at ORNL when operators tried to produce a 100,000 curie batch of Barium-140 which resulted in a three-day plant evacuation. Recent disclosures by the General Accounting Office about radiation warfare experiments conducted at Oak Ridge on American citizens where hundreds of thousands of curies of Lanthanum were released suggests the Barium-140 came from either from Oak Ridge or the ICPP depending on the date of the experiment. According to the extremely limited documentation EDI has on the Ba-140/La-140 shipments from ICPP to Los Alamos (production years 1960 and 1961), over 782,814 curies were sent and used in open air tests to evaluate the killing power of this radiological weapon. [26] CDC claims this RaLa period is not significant and therefore not included in the ICPP source term analysis. Nothing could be further from the truth.

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[25] ERDA-1552; Final Environmental Impact Statement, Safety Research Experiment Facilities, INEL, September 1977, US Energy Research & Development Administration.;
DOE/ID/12119, INEL Historical Dose Evaluation, USDOE ID Operations Office, Aug 1991.

[26] CPP Production Weekly Reports, Ay-95-60A and Ay-3-62A.

"Radioactive Lanthanum-140, daughter of Barium-140 has been used as an intense radiation source for a number of years. Historically, a need has developed for increasing batches of the Barium-140 sources material with additional emphasis on increasing specific activity of the barium. The increasing demand resulted in inadequacy of facilities of the original barium producer, the Oak Ridge National Laboratories (ORNL). The more recent availability of high specific activity fuel from the [INEEL] Materials Test Reactor indicate the desirability of locating production facilities in conjunction with that reactor. In fact, a RaLa production cell was provided for in the ICPP original design of the Chemical Processing Plant [ICPP] by ORNL. The popular term 'RaLa' is a misnomer since the research, development, and production is centered around the isotope barium-140."... "At this time [1951], ORNL commenced the development of a process [at ICPP], based on irradiated MTR elements as feed material, capable of consistently yielding batches of at least 30,000 curies." [IDO-14445 @ 14]

RaLa runs were conducted at ICPP during the nine year period of 1954-1963. During some periods in 1954-55 while the process was being developed, un-irradiated fuel was used. Between 1953 and 1963 the ICPP released 6,092,985 Ci to the atmosphere. [ERDA-1536@III-7] Discussions in this section focus primarily on pre-1957 Rala runs because DOE has not acknowledged them in their 1992 INEEL Historical Dose Evaluation report as Rala runs.

Acknowledged ICPP Iodine-131quantities released between 1957 and 1963 were 2,800 Ci, with the highest year being 1958 releasing 1,028 Ci of I-131. [ERDA-1536.@II-242] Internal DOE documents suggest the quantity of I-131 that may have been released in a single run was more than what DOE acknowledged for an entire year. This RaLa program is the INEEL equivalent of the infamous Hanford "Green-Runs" which also processed "green" reactor fuel. As discussed earlier, when reactor fuel is processed "green", that is, prior to a cooling period that allows short-lived radioactivity to "safely" decay, a significant amount of radioactivity is released to the environment when the fuel is processed. The ICPP emission control system during that period was very primitive. The veil of secrecy also allowed the nuclear alchemists to proceed without public notification or accountability. This secrecy persists today. DOE's 1991 INEEL Historical Dose Evaluation Report does not include nor acknowledge many RaLa runs or the 1956 Bluenose releases from ICPP. Some of the first process runs were conducted with non-irradiated simulated fuel. Documents gained by the Environmental Defense Institute under FOIA still contain major data that has been "censored" or blacked out. Full access to ICPP operations documentation is needed to accurately assess the RaLa program. It should be noted that it took nearly five years of public pressure on DOE to allow Q-clearance access to the daily fuel processing documentation at Hanford, however, all the documents are yet to be declassified. The same is true for INEEL. The Department of the Navy is a claiming jurisdiction over some of DOE's secret documents because they pertain to Navy fuel processing and they refuse to declassify the information.

"The RaLa process involves the dissolution and processing of a 2-day cooled MTR [Materials Test Reactor] fuel assembly for recovery of radioactive barium-140. The operation is performed over a 24-to-36 hour period several times each year and involves about 1,200,000 curies of short-lived fission products. While 1.2 million curies is not a great amount compared to the normal processing plant operations [ICPP], the quantities of such elements as xenon, iodine and lanthanum are tremendous compared to those normally encountered; furthermore, the 1.2 million curies is contained in a solution volume of only a few liters. Xenon and krypton, which go to the off-gas, amount to about 100,000 curies and special measures must be taken to prevent unauthorized release. Radio iodine, which can also be released under certain conditions, amounts to 50,000 to 100,000 curies." [IDO-14532,-p.13]

Phillips Petroleum, then operator of the ICPP, reported in the second quarter of 1957, that; "The liquid waste system operated satisfactorily except for failure to remove iodine resulting from RaLa processing". [IDO-14419,p.7] RaLa Run 002-RH originally scheduled for process on November 26, 1956, was delayed until November 30 "due to weather conditions being too adverse to permit gas release to the stack." [IDO-14414 @ 156] During run 002-RH, "Area AEC radiation surveys indicated that activity in the dissolver off-gas discharging from the stack persisted for about five minutes. During this period, the AEC sky scanner radiation instruments read maximum and then dropped to zero." [Ibid. @ 158] During this run, the Process Makeup Area was contaminated by a burst of airborne activity into the work area when the shipping pot was removed from the process cell. [Ibid. @ 45]

"The Barium-140 recovery (RaLa) at ICPP produces a separate off-gas stream, treated with extreme care because it normally contains kilocurie quantities of radio xenon and Radio iodine. The xenon is released under controlled conditions. If the weather permits, it goes directly to the plant stack. If the weather does not allow immediate release, it is held in a 10,000 cubic foot shielded gas holder until a more opportune time, or until the xenon has decayed to a low level." [ IDO-14532,p.26]

This holding tank was, however, not built and fully functional until 1958, two years after hot RaLa processing began. [IDO-14414 @ 170] Another problem, even after the off-gas holding tank was built, was that it could only hold 10 hours of operational emissions. [IDO-14414 @29&42] Since significant amounts of radionuclides continued to be released over days and weeks after the process run, the holding tank was of limited value even after it was installed.

RaLa Materials Test Reactor (MTR) fuel runs No.3 (12/56), and No.5 (2/57) contained 6,580 and 166,000 Ci of Iodine respectively. "Runs No. 3 & 5 weather conditions permitted venting all gases to the stack." [PTR-185 @6&7] [27] Run No. 3 had significant equipment malfunctions that resulted in extensive contamination of the L Cell. "Four hundred man-hours were expended in reducing the general background radiation in L cell from an estimated 1000 R/hr to 0.3-1 R/hr." [Ibid. @45] Exposure to the decontamination workers under those conditions would be expected to be considerable.

Scrubbers were later installed as part of the off-gas emission control system. "There are indications that considerable iodine activity passed through the scrubber. Smears indicated the presence of iodine in the stack. AEC site surveys indicated that local rabbits showed significant increases in thyroid radiation count immediately following Runs 3, 4, and 5. Since gases from the runs were not collected and sampled it is not known how much activity was discharged from the stack. The stack monitor, which was put into service just prior to Run No. 4, indicated that significant iodine activity continued to be released for several days after each of the last two runs was completed. This would indicate that iodine has a tendency to plate out or deposit in lines and vessels only to be released gradually." [PTR-185 @19&20] The biological significance of the release of radioactive iodine is that the human body readily assimilates it into the thyroid gland.

Rala Run No. 001-RP (Feb.1,1957) which processed 38,800 curies of barium and 70,000 curies of Iodine was delayed 17 hours until the wind changed directions away from populated areas. [PTR-185,p.6] February 20, 1957 run No. 002-RP contained 166,000 curies of Iodine. [Ibid.] The reason both Runs No.001-RP and 002-RP had such high Iodine content was because the cooling time for the fuel was two and less than one day respectively. Barium-140 runs in the third quarter of 1962 totaled 61,252 curies. [IDO-14599,P.1]

"RaLa off-gas involves a two-fold problem; namely, activity hazard due to contained active iodine and xenon, and explosion hazard due to contained hydrogen. The off-gas activity is too great to permit indiscriminate venting to the atmosphere and the hydrogen concentration is in the explosive region making mechanical compression and storage

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27 PTR-185; Preliminary RALA Hot Run Status Report, L.Legler, 3/19/57 Phillips Petroleum.

hazardous." [IDO-14414 @ 170] "Consequently operation was necessarily limited to periods when the weather was favorable for stack disposal." [Ibid] In other words, the ICPP operators were reluctant to put much off-gas into the holding tank because of the hydrogen explosion potential and therefore it was expedient to release it to the atmosphere. So processing was delayed until the radiation would be blown north away from the more populated areas to the southeast.

"The [ICPP] fission product noble gases are present in the dissolver off-gases, and any not recovered go to the atmosphere. Krypton-85 in amounts up to 2,000 curies per day could be released from power fuel processing. Comparable quantities of Krypton-85 have been released during previous operations without hazard to personnel on or off the site. This will be diluted by stack gas to 0.3 micro curie per liter [3 x $10^5$ pCi/L] at the top of the stack, about 100 times maximum permissible [at the time] level for air." [IDO-14532 @46] These documented statements by Atomic Energy Commission (AEC), predecessor to DOE, demonstrate the cavalier attitude about releasing large quantities of radiation to the environment. Moreover, no warnings were ever offered so that the public could take appropriate measures to protect themselves and their families.

"Total Iodine present in an [one] irradiated MTR fuel assembly after two days cooling approaches 76,000 curies with Iodine-131 accounting for 28,000 curies of the total. Approximately 80 % of this iodine was expected to reach the off-gas scrubber which was estimated to be 95% efficient in removing iodine. Thus about 3,000 curies of total iodine activity was expected to pass through the scrubber within a one hour period." [IDO-14414 @ 170] Even weeks after the fuel dissolution process is completed, iodine continues to escape. "It has been found that during quiescent conditions in the cell the iodine release will be from five to ten curies a day. Solution transfer or vessel decontamination will raise this to 20 to 50 curies per day. [IDO-14419, p.61] Considerable uncertainty exists between the design efficiency of scrubbers and the actual efficiency. See Stack Emission Section I(G). Uncontrolled iodine releases were also "escaping from centrifuges to cell off-gas which does not pass through the scrubber." [Ibid.] +[14494, p.19] The combined releases from these multiple sources were significant.

A postulated example of iodine releases applied to run number 002-RP would yield the following scenario. Run 002-RP had 166,000 ci of I-131. Using the extremely optimistic design standard of 95% efficiency of the scrubbers, and 80% release to the scrubber, and subtracting 80% from 166,000 Ci in the fuel, leaves 132,800 Ci released to the scrubber which theoretically had a 95% efficiency. That leaves 6,640 curies of iodine going out the stack over a two-day period. This figure would not include any DOE acknowledged releases escaping the centrifuges and cell off-gas system.

The above assumption scenario (non-conservative) is supported by DOE internal documents. "Approximately 80% of the I-129 is released as an airborne effluent and 20% is in the liquid effluent." [DOE/ID-12119@A-18] A 1978 DOE engineering study by Allied Chemical Idaho Operations for INEEL proposed an I-129, C-14, Ru-106 and Kr-85 filtration system for ICPP fuel reprocessing to reduce the emission of these radionuclides. "More than 99% of these volatile isotopes were assumed to be released during dissolution of the fuel rods." [ICP-1126@iv] The design was to include a matrix of filters to trap these volatilized isotopes. Should these filters fail or become plugged the system would just go back temporally to normal operation. During Rala Run 003-RH, "Approximately 7 percent of charged iodine was found in the scrubber solution after the run was completed." [IDO-14414 @ 158] This suggests iodine release fractions in the range of 93%. "Since the current practice of releasing all airborne iodine species is acceptable, short-term releases in future reprocessing plant would be considered an inconsequential accident." [Ibid.@18]

The above discussion is supported by the 1977 INEEL Environmental Impact Statement (EIS) which stated that "the efficiency of this scrubber was low for iodine."

[ERDA-1536 @ 242] The iodine content was so high in the RaLa reprocessing that the liquid waste evaporator would experience "Iodine-131 boil over during several batches when RaLa operations were in progress." [IDO-14430 @ 11] "Recent [1957] operational practices in the concentration of process equipment waste provided essentially no reliable decontamination of the condensate from iodine-131 in the feed. Many different schemes have been tried to retain iodine." "These schemes were not successful in improving the iodine decontamination of the stream." [IDO-14430 @ 18] RaLa Iodine releases varied widely depending on the fuel processed and the cooling time before processing. The extremely optimistically low figures for part of the Rala period (1957-63) offered in the EIS were 2,800 Ci. of Iodine-131 released to the atmosphere. Based on the crude emission system in use, these figures can only be considered as extremely understated. A thorough analysis of the entire process and the efficiency of the emission systems is needed to assess the probable radioactive releases.

Considerable variation existed in scrubber efficiency in removing Iodine-131 from 7% to 70% due to filter problems. [IDO-14287] These runs produced Barium-140 solutions averaging 5,400,000 R/hr. [IDO-14306 @ 7] , and containing a minimum of 30,000 curies. [IDO-14445 @14] The RaLa process MTR throughput fuel had extremely high burn-up rates of 24% which generated 55,600 curies of Ba-140 as opposed to undesirable 17% burn-up fuel that only produced 38,800 curies of Ba-140 for every 168 grams processed. [IDO-14445 @21] The known hazard with reprocessing high burn-up fuel with less than a two-day cooling time was the release of volatilized iodine, ruthenium and krypton. "Ruthenium accounted for about 10% of the volatile activity other than krypton, with about nineteen times as much ruthenium coming off during the acid dissolution as during the caustic dissolution." [IDO-14445 @31]

Efforts by ICPP operators to reduce iodine releases included dilution of the post process waste and neutralization of the caustic supernate [sic]. "In the case of the caustic solution diluted thirty-fold, the maximum amount of iodine trapped from the off-gas was 0.93 percent. Material balances were good. With the caustic solution diluted only fifteen-fold, the amount of iodine trapped averaged about 1 percent."[IDO-14445 @80] Another 1958 Phillips Petroleum report discussed attempts to improve the Process Equipment Waste (PEW) iodine scrub efficiency by adding neutralizing solutions. "With no neutralization of the evaporator feed, there was essentially no decontamination from Iodine-131 in the [PEW] condensate." But even this effort "yielded a condensate which contained about 0.5 percent of the iodine from the feed." [IDO-14443 @ 16][IDO-14430 @18] This documentation suggests extremely poor performance of emission control systems to filter/ scrub out iodine prior to release to the atmosphere. "Since the curies of activity associated with these elements [iodides] is of similar magnitude to that of the barium being produced [30,000 to 60,000 curies] provisions to conduct dissolution under meteorological control may be necessary or an accumulator vessel to retain the gases for several weeks; decay prior to venting may be required, in order to avoid possibilities of area contamination or personnel exposure if dispersion of the plant stack gas is inadequate." [IDO-14308 @8] Even at very low PEW efficiency rates for iodine the condensate was still extremely radioactive because of very high curie content of the fuel being dissolved as feed. "Because the feed to this [PEW] evaporator is usually fairly high in activity, the condensate represents a significant source of activity discharge to ground from the plant." [IDO-14362 @ 8] This is a reference to waste discharged to the injection well. 1959 Phillips Petroleum reports continue to acknowledge that low iodine scrubber efficiencies of 17.9% of the calculated iodine was found in the caustic and less than 1% in the acid solution. [IDO-14445 @94]

Recent revelations about Hanford releases from fuel reprocessing exposed by the Hanford Environmental Dose Reconstruction (HEDR) Project are germane to INEEL. [TSP News letter, 12/92] The original estimates or 530,000 curies of I-131 released from Hanford were based on unreliable stack monitoring data. The public and independent researchers knew

this was not true. After nearly five years of public pressure, DOE finally allowed access to classified daily fuel reprocessing data that allowed scientists to do a physical reconstruction of the Green Runs. The results showed an increase of 70% over previously DOE acknowledged releases of 530,000 curies Iodine-131. [Bensen @2] As previously discussed in Section I(G) the key elements of the data needed for a physical reconstruction are:

1.) Cooling time of the fuel processed. Short cooling periods of hours or days rather than months means that short-lived isotope inventories such as I-131 will be much higher in the fuel.

2.) Release fractions. This figure is based on how much of the iodine present in the fuel is released to the environment. For Iodine-131, HEDR calculated the release fraction to be 90.5%.

3.) Reactor power levels of fuel used. A direct relationship exists between the reactor power level and the isotopes created in the fuel. The higher the power level, the more Iodine-131 is generated. [HEDR Technical Steering Panel News letter, 12/92]

4.) Fuel type and percentage U-235/Pu-239 enrichment.

The Hanford Health Information Network reports independent Downwinder consultant research showing Plutonium-239 releases between 1945 and 1969 as high as 1600 curies. These plutonium release estimates are based on Hanford's George Brabb's 1961 internal memo assessing fuel reprocessing (Z Plant) "and found the filtering system was not adequate to capture the vaporized plutonium oxide which was essentially in a gaseous form when released by burning. This was revealed by the fact that a significant amount of plutonium was found in the ducts of the vacuum system...even though it was protected by filters. This convinced me that fine plutonium was being released into the atmosphere from Z Plant." [Connections(b)] The reason for citing the Hanford problems is not to compare the release numbers but to compare the emission control system problems because the technology in any given era was the same whether at Z Plant or the ICPP.

As of this writing, CDC refuses to do a physical reconstruction of the INEEL RaLa Runs as part of the INEEL Dose Reconstruction Health Study. CDC is opting for the use of discredited DOE stack monitoring data. This is another deliberate attempt by CDC to understate the radiation release estimates in the hope that the government's liability exposure will be minimized. There are extremely important "lessons learned" from the Hanford studies that the public justifiably wants applied to the INEEL studies.

Plutonium was also extracted from the high burn-up power reactor fuels processed at the ICPP. F and V cells generated plutonium batches up to 500 grams. [IDO-14306] Plutonium emissions must be included in any analysis. The solvent burner is noted in numerous reports as a problem area. The solvent burner is used to incinerate the waste solutions used to dissolve the fuel rods containing plutonium. "Plutonium is the most bothersome contaminate" in this Solvent Burner and its "Combustion gases go directly to the main plant stack without filtering." [IDO-14287] "The solvent burner is probably the largest source of Transuranic discharged to the stack and the largest unfiltered radionuclide discharge at ICPP." [ENICO-1086 @1]

Acknowledged Chem Plant (ICPP) airborne radioactive releases during the Rala runs (1953 through 1963) totaled 6,092,985 curies of gross beta and gamma isotopes. RaLa runs in 1959 released the highest airborne radioactivity at 1,334,902 curies of gross beta and gamma isotopes. [DOE/ID-12119@A-41][Also see Appendix listing by year] These figures do not include other INEEL facilities that were also releasing considerable quantities of radiation. For instance, the Test Reactor Area's Materials Test Reactor that provided the RaLa Run fuel rods re-

leased excessive amounts of Strontium 90 both to the air and to effluent water used to cool the reactor. [IDO-16375, p.8-9] Between 1952 and 1968 alone, the Test Reactor Area released 5,035,572 curies of radioactivity to the atmosphere. [Ibid @ A-30] Iodine-131 (around ICPP) activity in jack rabbit thyroids for the 1958 sampling period peaked in March at 709,000 d/m/g. At sixteen and twenty miles distance from the ICPP the I-131 activity dropped respectively from to 140,000 d/m/g to 93,000 d/m/g. "The highest thyroid I-131 activity ever observed at the [National Reactor Testing Station now called INEEL] NRTS [up to 12/58] jack rabbits was observed in two animals collected on September 10 [1958]. Their mean I-131 activity was $7.7 \times 10^6$ [7,700,000]." [IDO-12082(58)@78-87]

INEEL's Historical Dose Assessment Report acknowledges only 78 Rala Runs. This DOE report list begins with what they call Rala Run 001 in February 1-3, 1957. [DOE/ID-12119 @ A-33] Yet, Phillips Petroleum, ICPP contractor at the time, documents that, "the first RaLa hot run was completed using re-irradiated MTR elements." [PTR-122, page 16] another Phillips ICPP report notes additional "Hot runs were begun on November 24, 1956." [PTR-185 @ 5] Although fifteen runs are acknowledged, details are given for only eight runs up to June 1957. [IDO-14414 @ 131] It must be emphasized that the Environmental Defense Institute's analysis is limited due to DOE's unwillingness to declassify all INEEL operating history documents. Therefore, the information contained here is not by any means conclusive. As of this writing, DOE has yet to declassify documents requested by CDC for both the Hanford and the INEEL dose reconstruction health studies. This is discouraging since the Hanford requests are seven years old and the INEEL requests are three years old.

### B. CDC's Recent Reviews of ICPP RaLa Runs

CDC's arbitrary determination that the quantity of radioactive iodine released from INEEL into the atmosphere (release fractions) is between 1.2 and 0.5%, [28] is hugely contrasted by the Hanford Environmental Dose Reconstruction (HEDR) study that put release fractions at 90.5%. [29] Given the same time periods and similar operations (processing "green" reactor fuel), emission control, and monitoring systems, it is difficult reconcile this divergent assessment. One credible explanation is that the HEDR revised release fractions were ultimately based on a physical reconstruction of the Hanford "Green Run" era, and CDC's review of INEEL release fractions are based on questionable assumptions and not on a physical reconstruction of the RaLa Runs.

The table below lists only the 82 RaLa runs that FOIA documents received by Environmental Defense Institute via FOIA. Barium-140 (Ba-140) quantities are listed because INEEL reports note (see discussion below) that the iodine quantities are about equivalent to the barium quantities, and thus is a crude means of verifying the CDC's release fractions. CDC claims that only RaLa runs between 1957 and 1959 were analyzed because the other runs released insignificant amounts of Iodine. The table below shows that this CDC perspective is not supported by the evidence currently available to EDI. Even a cursory scan of the table below show Ba-140 recovery/content numbers generally high through 1963.

**Partial Listing of INEEL ICPP RaLa Run Processing**
**1956 through 1963**

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[28] CDC/SC&A, 11/03, page ES-12.

[29] Hanford Environmental Dose Reconstruction, Technical Steering Panel News Letter, 12/92.

| Run Date | Run Number | I-131 Curies | Total Iodine (Curies) | Cooled Days | Ba-140 Recovered Curies & % | Total * Ba-140 Charged (Ci) |
|---|---|---|---|---|---|---|
| 8/56 Hot Run | shake-down | -?- | -?- | -?- | -?- | -?- |
| 11/24/56 | 001-RH | ? | 5,000 | 3 | 835 30% | 5,000 |
| 11/30/56 | 002-RH | 1,260 | 10,000 | 4 | 7,947 54% | 18,518 |
| 12/6/56# | 003-RH | 6,580 | >6,580 | 1 | 18,000 | ~36,000 |
| new | number | series | | | | |
| 2/1/57 # | 001-RP | 70,000 | >70,000 | 2 | 38,800 | 70,000 |
| 2/20/57# | 002-RP | 166,000 | >166,000 | >1 | 55,000 | ~110,000 |
| 4/5/57 | 003-RP | 13,560 | >13,560 | 2 | 28,000 78.2% | 35,806 |
| 5/19/57 | 004-RP | 14,500 | >14,500 | 7 | 29,150 73.2% | 39,822 |
| 6/24/57 | 005-RP | 17,700 | 33,081 | 6 | 32,000 45.2% | 70,796 |
| 9/11/57 | 006-RP | 21,700 | 64,937 | 2 | 23,000 58.7% | 39,182 |
| 10/8/57 | 007-RP | 24,400 | 70,846 | 2 | 22,800 | ~70,846 |
| 10/21/57 | 008-RP | 11,700 | 95,178 | 8 | 37,000 81.8% | 45,232 |
| 1/6/58 | 009-RP | 7,000 | 10,110 | 8 | 21,000 | ~42,000 |
| 2/12/58 | 010-RP | 25,800 | 75,276 | 2 | 34,158 67.7% | 50,455 |
| 3/13/58 | 011-RP | 22,800 | 66,367 | 2 | 30,400 | ~60,800 |
| 4/16/58 | 012-RP | 27,300 | 82,237 | 2 | 30,000 | ~82,237 |
| 4/30/58 | 013-RP | 26,900 | 133,600 | 2 | 29,960 | ~60,000 |
| 5/28/58 | 014-RP | 24,200 | 71,689 | 2 | 27,500 | ~55,000 |
| 6/2/58 | 015-RP | - | - | 7 | 14,830 | ~28,000 |
| 8/6/58 | 016-RP | - | - | 2 | - | -?- |
| 8/13/58 | 017-RP | - | - | 9 | - | -?- |
| 10/1/58 | 018-RP | - | - | 2 | w/below | -?- |
| 10/22/58 | 019-RP | - | - | 2 | w/below | -?- |
| 10/23/58 | 020-RP | - | - | 1 | 46,000 | ~92,000 |
| 11/12/58 | 021-RP | - | - | 2 | 21,000 | ~42,000 |
| 4/59 | 022-RP | - | - | 2 | 23,400 49% | 47,755 |
| - | 023-RP | - | - | 1 | 10,200 68% | 15,000 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| - | 024-RP | - | - | 2 | 24,800 | 58% | 42,759 |
| - | 025-RP | - | - | 2 | 23,160 | 57% | 40,631 |
| - | 026-RP | - | - | 2 | 19,270 | 44% | 43,795 |
| - | 027-RP | - | - | 1 | 23,900 | 58% | 41,207 |
| 6/59 | 028-RP | - | - | 2 | 26,200 | 63% | 41,587 |
| | 029-RP | | | 7 | 26,000 | | ~52,000 |
| 7/59 | 030-RP | | | 1 | 26,000 | | ~52,000 |
| 8/59 | 031-RP | | | 1 | 29,000 | | ~58,000 |
| 9/59 | 032-RP | | | 1 | w/below | | |
| 9/59 | 033-RP | | | 1 | 45,000 | | ~90,000 |
| 10/14/59 | 034-RP | - | - | 2 | 26,000 | | ~ 52,000 |
| 11/5/59 | 035-RP | - | - | 2 | 21,620 | 48.3% | 44,762 |
| 11/30/59 | 036-RP | - | - | 2 | 14,075 | 60.4% | 23,303 |
| 12/59 | 037-RP | - | - | 2 | 26,137 | | ~52,000 |
| 1/26/60 | 038-RP | - | - | - | 31,760 | 58.6% | 54,198 |
| 2/24/60 | 039-RP | - | - | - | 26,650 | 41.1% | 64,842 |
| 3/30/60 | 040-RP | - | - | - | 31,200 | 56.6% | 55,123 |
| 4/60 | 041-RP | - | - | - | 33,047 | 56% | 59,102 |
| 6/60 | 042-RP | - | - | - | 32,590 | 57.3% | 56,719 |
| 6/60 | 043-RP | - | - | - | 35,800 | 63.4% | 56,467 |
| 7/12/60 | 044-RP | - | - | - | - | | - |
| 8/2/60 | 045-RP | - | - | - | 30,600 | 54.8% | 55,839 |
| 8/24/60 | 046-RP | - | - | - | 29,324 | 61.8% | 47,449 |
| 9/60 | 047-RP | - | - | - | 16,200 | 56% | 28,928 |
| 10/60 | 048-RP | - | - | - | 31,800 | 60% | 53,000 |
| 10/21/60 | 049-RP | - | - | - | 25,400 | 60.6% | 41,914 |
| 1/3/61 | 050-RP | - | - | - | 31,346 | 50.4% | 62,194 |
| 1/17/61 | 051RP | - | - | - | 27,012 | 55.1% | 49,023 |
| 2/7/61 | 052RP | - | - | - | 27,500 | 52.2% | 52,682 |
| 3/1/61 | 053RP | - | - | - | 25,000 | 48.2% | 51,867 |
| 3/22/61 | 054RP | - | - | - | 32,350 | 56.8% | 56,954 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 4/12/61 | 055RP | - | - | - | 21,600 | 46.5% | 46,451 |
| 5/61 | 056RP | - | - | - | 28,700 | 51% | 56,274 |
| 5/61 | 057RP | - | - | - | 22,250 | 48.3% | 46,066 |
| 6/13/61 | 058RP | - | - | - | 24,850 | 44.7% | 55,593 |
| 7/10/61 | 059RP | - | - | - | 22,800 | 53.4% | 42,696 |
| 8/15/61 | 060RP | - | - | - | 21,600 | 46.2% | 46,753 |
| 9/61 | 061RP | - | - | - | 26,972 | 51.9% | 51,969 |
| 9/26/61 | 062RP | - | - | - | 22,300 | 45.6% | 48,903 |
| 10/17/61 | 063RP | - | - | - | 27,234 | 54.9% | 49,606 |
| 11/61 | 064RP | - | - | - | 18,700 | 46.3% | 40,389 |
| 11/61 | 065RP | - | - | - | w/ below | | - |
| 11/61 | 066RP | - | - | - | 26,800 | 46.3% | 57,883 |
| 1/10/62 | 067RP | - | - | - | 28,100 | 54.2% | 51,845 |
| 1/31/62 | 068RP | - | - | - | 23,300 | 44% | 52,954 |
| 2/20/62 | 069RP | - | - | - | 26,800 | 48% | 55,833 |
| 3/62 | 070RP | - | - | - | 22,800 | 45.2% | 50,442 |
| 4/62 | 071RP | - | - | - | 27,000 | 43.8% | 61,643 |
| 8/14/62 | 072RP | - | - | - | 21,185 | | ~42,000 |
| 9/18/62 | 073RP | - | - | - | 40,067 | 65.9% | 60,799 |
| 11/62 | 074RP | - | - | - | 7,229 | 25% | 28,916 |
| 12/62 | 075RP | - | - | - | 4,410 | 9.1% | 48,461 |
| 1/7/63 | 076RP | - | - | - | 18,875 | 46.1% | 40,943 |
| 2/31/63 | 077RP | - | - | - | 30,976 | 58.1% | 53,315 |
| 3/27/63 | 078RP | - | - | - | 21,000 | 53.4% | 39,326 |
| 4/17/63 | 079RP | - | - | - | 32,300 | 63.9% | 50,547 |
| | | | | | | | |
| Total Runs Listed Above | 82 | in-complete Iodine totals | ~974,461 1956 to May 1958 | | incomplete totals for Ba-140 Shipped to ANL ~1,992,219 Ci | | ~3,784,255 curies charged to dissolver |

* If the total Ba-140 charged to the dissolver is not stated in DOE document, then it is calculated based on Ba-140 recovered and percentage recovery rate stated for each individual run in the document. The Ba-140 is listed here because it indicates a near equal quantity for iodine content in

the initial fuel/slug reprocessed. The (~) notations are estimates based on an average of 50% recovery rate between recovered Ba-140 or the total iodine species documentation that shows direct correlation to Bs-140 and Iodine releases.

# PTR-185; Preliminary RALA Hot Run Status Report, L. Legler, 3/19/57 Phillips Petroleum.; IDO-14410 states "A second [the first for 1957 was 2/1/57] high-level barium-140 run was undertaken three weeks later....[and] relatively large quantities of iodine were released during later stages of the process." Page 12.

**References for Above Table**:
[PTR-122][PTR-152][PTR-163][IDO-14034] [IDO-14414][PTR-181 & 185] [IDO-14430][IDO-14419] [PTR-749][IDO-14599][IDO-14494][IDO-14512][IDO-14453] [IDO-14430][PTR-185][PTR-181][IDO-14419][IDO-14410][IDO-14344] [IDO-14534] [IDO-14534] [IDO-14520] [IDO-14550] [IDO-14553] [CPP Production Weekly Report series starting with Ay-9-60A through Ay-68-63A] [Ay-3-62A shows total Ba-140 shipments for calendar year 1961 at 406,214 Ci.] [Ay-95-60A shows Ba-140 shipments to Las Alamos for operating year 1960 at 376,600 Curies] [CPP Production Weekly Reports, Rei-1957/1958 series] [SC&A 2/03]

A Phillips Petroleum RaLa Run report states "It is assumed that inert gas fission products and iodine will be evolved in this or the following [RaLa] process step. **Since the curies of activity associated with these elements is of similar magnitude to that of the barium being processed,** provisions to conduct dissolution under meteorological control may be necessary, or an accumulator vessel to retain the gases for several weeks decay prior to venting may be required, in order to avoid possibilities of area contamination or personnel exposure if dispersion of the plant stack gas in inadequate." [30] [IDO-14307@8 emphasis added] One can therefore get an approximate estimate of the radioactive iodine content of the fuel based on documented reports of Barium-140 produced. The above table shows an estimate of ~ 3.8 million curies of Ba-140 charged to the ICPP dissolver, so a credible argument can be made that a significant portion of the related Iodine was released .

**DOE Estimates of Atmospheric RaLa Releases of Iodides and Beta Activity 1957 to 1963**

| Year | Run Numbers | Curies Released |
|---|---|---|
| 1957 | 006 through 008 | 6,399.00 |
| 1958 * | 009 " 021* | 5,334.87 |
| 1959 | 022 " 037 | 1,605.60 |
| 1960 | 038 " 049 | 246.44 |
| 1961 | 050 " 066 | 352.27 |
| 1962 | 067 " 075 | 253.26 |
| 1963 | 076 " 079 | 116.55 |
| Totals | 79 | 14,307.99 |

[DOE/ID-12119 @ A-33] [* IDO-12082(58) lists 13 RaLa runs between 1/6/58 & 10/23/58]

A criticality (uncontrolled nuclear chain reaction) accident at the ICPP on October 16, 1959, one day after a RaLa run on the 15th increased the atmospheric releases. An AEC

[30] IDO-14307; Development of RALA Process for Instillation at Idaho Chemical Processing Plant, E. Anderson, July 8, 1954, Phillips Petroleum Co.

accident report noted twenty-one workers were exposed and offered the following description of the RaLa run.

> "A RaLa run had been completed on the afternoon of October 15. This process involves the separation of radio-barium from short-cooled MTR fuel elements. Dissolution of these short-cooled elements and even later disturbance of solutions in post-run cleanup usually cause some release of fission product iodine to the process vent system. On some occasions iodine has escaped to the access corridor and PEW control room in sufficient quantity to set off the sensitive air monitor alarms in those areas. Consequently, it was natural initially to suspect that the release of apparently short-lived air-borne activity was in some way related to the RaLa equipment. This assumption seemed to have been further substantiated by the fact that : the RaLa process instruments indicated that a pressure surge had occurred, no other instruments that were observed in the hurried re-entry [after ICPP accident evacuation] showed evidence of more than minor disturbance, and high level (greater than 25 R/hr) contamination was discovered around the RaLa slug chute. High level contamination noted in the PEW control room was a reasonable consequence of the pressure surge initiated in the RaLa system." [IDO-10035 @ 16]

Another ICPP criticality accident on January 25, 1961 during the RaLa period also released radioactivity to the atmosphere. This incident (requiring full evacuation) occurred during the work week when 251 employees were at the ICPP. The radioactive cloud traveled southwest toward Big South Butte where it stagnated for several hours before moving on south. Radiation readings at Big South Butte ranged over 200 counts per second. Readings at Central Facilities Area, 2 miles south ranged over 30 mrem. [IDO-10036@35] AEC accident report notes the following:

> "Two processes in the plant handle gaseous and volatile fission products, viz., a radio-barium separation system (RaLa process) and the dissolver off-gas handling system. A RaLa processing run had been completed two days earlier and no operations were being performed in that equipment. However, post-run activities in the past had resulted in some release of Iodine-131. Chemical changes in the process and essentially eliminated this problem, but the associated high concentrations of short-lived fission products cause this system to be suspect in any unidentified radiation incident."
> [IDO-10036@35]

RaLa process runs as late as October of 1961show Iodine-131 releases continued as a "factor of 100 too high to allow operation of the RaLa process during poor [weather] diffusion conditions." Remember, CDC wants the public to believe the RaLa period ended in 1959. This ICPP process report states that "Uncontrolled releases of large amounts of iodine occurred during the early stages of the RaLa operation at the ICPP," and that only a "ten-fold reduction in the iodine content of the off-gas was achieved by process modifications." This report further shows that of the total iodine charged to the dissolver, "about 10 percent of the iodine is found in the [product] precipitate and the remainder [90%] in the [waste stream] supernate." [31] In view of the huge iodine releases this acknowledgment is not comforting because the numbers remain huge. This raises a significant issue of iodine releases from the waste transfer and storage tank releases not necessarily included in the CDC iodine estimation methodology. "Most of the iodine found in the vessel off-gas system is released during solution transfers, particularly transfer of the process wastes to storage. Each of the three iodine contaminates systems - process off-gas vessel off-gas and cell ventilation air is capable of releasing hazardous quantities of radioactive iodine to the

[31] IDO-14566, Containment of Iodine-131 Released by the RALA Process, Phillips Petroleum, October 30, 1961, page 11.

atmosphere." CDC fails to provide adequate documentation that the vessel off-gas (VOG) was vented to the ICPP main-stack and if it was therefore included in the main-stack monitoring sampling during this entire period of "hot reprocessing". CDC states, "However, possible leakage into the off-gas cell that housed the charcoal beds would have by-passed the stack monitor." [32] 1957 CPP reports state, "It has been found that during quiescent conditions in the cell the iodine release will be from five to ten curies a day. Solution transfer or vessel decontamination will raise this to 20 to 50 curies per day." [33] This verifies the above source of iodine release distribution.

**C. Concurrent ICPP RaLa Related Operations Not Analyzed by CDC**

As noted above the 90% of the iodine originally charged to the ICPP RaLa dissolver ends up in the waste stream, therefore, the concurrent ongoing operation of the ICPP Solvent burner (LE-102) used to incinerate highly contaminated used dissolver solvent waste, [34] high-level liquid waste evaporator, [35] and Waste Calcine Facility incinerator [36] contributed to the iodine releases during the subject period. [37]

The operation of the evaporator is not trivial as CDC would lead us to believe. For instance during the RaLa runs, the evaporator (H-110) had a criticality "excursion" incident 1/26/61, "at 0945 causing the evacuation of plant personnel ...[and] the process was down for the remainder of the month..." [38] Although CDC reviewed the CPP criticality incident 10/16/59, the agency does not even acknowledge this evaporator criticality.

Again, CDC makes no effort to definitively determine if these specific releases would have been included in the stack monitoring data CDC relied on to estimate iodine releases. Other system leaks (i.e., off-gas hold up tank) are also not even acknowledged by CDC. [39] The CPP Process Equipment Waste Evaporator (PEW) is also a significant source of Iodine releases. "The principal source of iodine-131 in the PEW appeared to be from the RaLa process off-gas lines which drain to the evaporator feed tank (WL-102)... in excessive concentrations... of one million d/(min)(ml) in the feed tank. The rate at which iodine-131 builds up in the evaporator feed tank depends on the decay time since the last RaLa run and the number of RaLa solution transfers in the cell, which

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[32] Atmospheric Source Terms for ICPP Plant, 1957-1959, Revised Draft November 2003, page ES-3, SC&A.

[33] IDO-14419, page 61

[34] CPP Production Weekly Report No. 339, February 26 to March 4, 1961, Ay-57-61A, page 6; also see Ay-17-62A, page 9, and Ay-49-62A, page 9.

[35] CPP Production Monthly Report No. 7, October 1, to October 31, 1960 states data rates for ICPP evaporator waste concentration as, "A total of 293,626 gallons of waste solution.... was re-concentrated to a volume of 151,286 gallons and stored in permanent storage tank WM-184." Page 4, Ay-135-60A. This is characteristic of many CPP reports claiming similar waste concentration rates during the RaLa period.

[36] DOE High-Level Waste Environmental Impact Statement shows the Waste Calciner Facility processed 4,061,500 gallons of high-level liquid waste between 1963 and 1964. DOE/EIS-0287D, page C.9-11.

[37] Idaho Chemical Processing Plant Progress Report, March 1955, IDO-14335, page 12. Also see CPP Production Weekly Report, 12/27/59 - 1/60, Ay-2-60A that also notes "stack monitor failure" during RaLa Run 038-RP, and the report noting Solvent Burner incinerator discussion in CPP Report, Ay-9-60.

[38] CPP Production Monthly Report No. 10, January 1, 1961 to January 31, 1961, Ay-20-61A.

[39] CPP Production Monthly Report No. 14, May 1 - 31, 1961, Ay-133-61A. states, "Leak check showed a loss of about 20 cubic feet per hour, mostly around the top of the bag."

presumably stir up and the volatilize the iodine in the cell." [40] The PEW had a criticality "nuclear incident" 10/16/59 that caused shutdown of the operation. [41]

Numerous ICPP reports acknowledge RaLa runs that triggered distant INEEL site "Guard Posts" activated monitoring instrument alarms that show major radiological releases to the atmosphere. [42] These significant atmospheric releases during RaLa Runs in 1961 were **not** considered by CDC important enough to include in the agency's ICPP source term analysis. Again, as discussed previously, CDC arbitrary limited review of only 1957 - 1959 RaLa Runs is unacceptable and documented data provided herein demonstrates CDC's grossly inadequate analysis.

Issues related to the high-level waste evaporator process are reported in 1961 documents. ICPP operator Phillips Petroleum reports acknowledge a criticality incident where, "Operations were suspended 1/25/61 ... due to a nuclear incident [that] was experienced in H-100 evaporator causing **evacuation** of the plant personnel. Although the process was down for the remainder of the month, no apparent damage resulted from the incident." [emphasis added] [43] This further documents that the evaporators were operating and that major emissions were released during this waste processing part of the RaLa Runs and worker exposures resulted.

## V. Conclusion

The limited amount of information available to the Environmental Defense Institute (EDI) via numerous Freedom of Information Act (FOIA) requests to DOE Idaho Operations Office, DOE Hanford Operations Office, U.S. Air Force, and other state and federal agency reports reveals that it is not possible to fully or accurately show the full extent of INEEL radioactive releases that impacted the public.

What EDI's review of DOE reports does show, quantify and document is that CDC's INEEL Dose Reconstruction study draft reports on ICPP RaLa iodine releases have enormous deficiencies that a reasonable reviewer will find that CDC's reports are not credible. Specifically, CDC only analyzes about a third of the RaLa runs in its ICPP source term estimates and bases this truncated review on "limited data." Moreover, CDC claims that the 1957 through 1959 RaLa runs represent the "major releases." EDI provides herein documentation that this CDC assumption is not credible nor scientifically supportable based on DOE documents cited. The weekly CPP Production Reports reviewed by EDI state the amount of Ba-140 recovered from each RaLa run and the percentage recovered from the total Ba-140 charged to the dissolver. CDC either chose to ignore or never bothered to access this essential documentation.

CDC's arbitrary determination that the quantity of radioactive iodine released from INEEL into the atmosphere (release fractions) is between 1.2 and 0.5%, is hugely contrasted by the Hanford Environmental Dose Reconstruction (HEDR) study that puts release fractions at 90.5%. Given the same time periods and similar operations (processing "green" reactor fuel), emission control, and monitoring systems, it is difficult reconcile this divergent assessment. One credible explanation is that the HEDR revised release fractions were ultimately based on a physical

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[40] IDO-14443, 1958, page 17

[41] PTR-447, ICPP Monthly Progress Report October 1959, page 7.

[42] See CPP Weekly Reports, (on specific RaLa Runs) Ay-57-61A (053RP), Ay-85-61A (054RP), and Ay-107-61A (055RP)

[43] CPP Production Monthly Report No. 10, 1/1/61 to 1/31/61, Ay-20-61-A, Phillips Petroleum, Idaho Operations Office, U.S. Atomic Energy Commission. Also see report Ay-43-61 on "nuclear excursion" in evaporator system 1/25/61.

reconstruction of the Hanford "Green Run" era, and CDC's review of INEEL release fractions are based on questionable assumptions of DOE monitoring data and not on a physical reconstruction of the RaLa Runs.

This report documents internal ICPP reports stating that there is a near equal quantity relationship between iodine species and barium-140 initially charged to the dissolver process. The rough estimates in this report show about 3.8 million curies of Ba-140 processed which means an equivalent amount of Iodine was also charged and processed. Applying the above CDC release fractions of 1.2% equals about 45,411 curies of iodine released. Applying the above HEDR release fractions of 90.5% equals about 3,424,750 curies of iodine released to Idaho's atmosphere. Data available to EDI on the limited period (1956 to 1958) specific to iodine numbers amount to about 974,000 curies which alone is an enormous amount.

EDI fears that if this deficient CDC analysis, currently in draft form, eventually becomes the "final word" on INEEL radioactive emission to the environment, the real "official" truth may not be told unless a major class-action suit is launched, as with Hanford. Given the DOE's massive document destruction efforts over recent years (with CDC's apparent complicity), it remains uncertain whether even a court sanctioned "discovery" process would yield essential information related to INEEL radioactive releases.

That being said, there are other new means to quantify radioactive releases by testing the teeth of "down-winders" [44] and analyzing tree core samples, ruminant antlers, and other data. [45] Other recent reports by CDC/SC&A [46] are currently under review by EDI and are not included in this comment discussion, but will be forthcoming and duly submitted to CDC. For future EDI analysis of these CDC reports see EDI's website http://www.environmental-defense-institute.org

[44] See Radiation Public Health Project study published in the journal *The Science of the Total Environment* as reported in USA Today 1/6/04.

[45] See International Atomic Agency, part of United Nations findings reported by the New York Times, 12/3003, that notes "The lab analyzes up to 2,000 samples of nuclear materials and 500 environmental samples a year. Its ultra-sensitive machines can tease vital information form particles one one-hundredth the width of a human hair." http://www.nytimes.com/2003/science/30SLEU.html

[46] CDC/SC&A have also released the following reports not yet reviewed by EDI; 1.) A Critical Review of the Source Terms for Select Initial Engine Tests Associated with the Aircraft Nuclear Propulsion Program (7/03), 2.) An Analysis of the Atmospheric Dispersion of Radionuclides Released from INEEL, 11/03, 3.) Doses to the Public from Atmospheric Releases of Radionuclides from INEEL, 11/03.

# Attachment A

**EDI Freedom of Information Act (FOIA) Hanford Requests**

Dorothy Riehle, Office of External Affairs
U.S. Department of Energy, Richland Operations Office
P.O. Box 550 Richland, WA 99352

January 19, 1998

Dear Ms. Riehle,

RE: Freedom of Information Act Request (RL-97-086)
Thank you for sending the Declassifications Requested by the Technical Steering Panel of Hanford Documents Produced 1944-1960 (PNWD-2024) pursuant to negotiations with the Office of Hearings and Appeals. The Hanford Public Reading Room sent a copy of the Hanford Site Originated Documents 1944-1960, Secret and Confidential Draft of Listed Hanford Site Originated Documents [PNL-10238]. These were helpful in clarifying the INEEL Research Bureau (IRB) FOIA request. The IRB is a project of the Environmental Defense Institute, Inc..
Attached please find a revised list to the IRB's September 4, 1997 FOIA list that provides a more accurate description of the requested documents.
Should you need further information concerning the INEEL Research Bureau's research program on this request please contact me by phone at 208-835-6152, in order to speed consideration of this matter.

Sincerely,
Chuck Broscious, INEEL Research Bureau, Coordinator
cc:
IRB Member Organizations
Michael Sage, Center for Disease Control
INEEL Health Effects Subcommittee

Environmental Defense Institute FOIA to Hanford
(September 4, 1997) Attachment (FOIA/Bluenose.3.revised2)
Revised List (11/3/97)(1/9/98)(1/17/98)
As of 3/3/01 only 41 of the requested 158 documents were sent and all 41 were heavily censored to the extent that they were nearly useless.

HAN-40193 Project Bluenose Committee Experiments, 7/13/51
HAN-40477 Bluenose and other Matters, 7/27/51
HAN-40927 Project Bluenose Experiments, Cook, 9/7/51
HAN-40953 Status of Project Bluenose, Holsted, 8/22/51
HAN-41268 Project Bluenose Experiments, 10/4/51
HAN-41861 Shipment of Irradiated J Slugs to Arco, 11/15/51
HAN-42440 Downtime for Project Bluenose, 1/4/52
HAN-42448 Idaho CPP startup materials, 12/29/51
HAN-42692 Idaho CPP Start-Up Materials, 1/14/52
HAN-42758 Canning special slugs for Arco, 1/16/52
HAN-42842 Processing J slugs at Arco, 1/24/52
HAN-42861 Shipment of Irradiated slugs to Arco
HAN-43290 Idaho CPP Startup Material, 2/19/52

HAN-43373 Canning Special Slugs for Arco, 2/27/52
HAN-44407 Project Bluenose Discussions at Argonne Nat. Lab., 4/10/52, 4/10/52
HAN-44439 Bluenose 5/2/52
HAN-45259 Bluenose Data, 6/20/52
HAN-45263 Project Bluenose Experiments
HAN-45268 Bluenose Experiment Analytical Samples, 6/18/52
HAN-45269 Bluenose Experiment Analytical Samples, 6/19/52
HAN-45274 Calculations and Transmittal of Krypton Release Data, 6/24/52
HAN-46940 Bluenose Experiment Analytical Results, 10/8/52
HAN-47812 ARCO Separations Plant, 11/26/52
HAN-50465 Bluenose dissolving data, 5/22/53
HAN-50467 Measurement of SF material content of irradiated J slugs at Idaho CPP, 5/20/53
HAN-50518 Bluenose releases, 5/28/53
HAN-50693 Review of Bluenose Chemical Analyses, 6/1/53
HAN-50767 Bluenose Analytical meeting at ORNL May 21& 22, 1953, 6/3/53
HAN-50838 Project Bluenose meeting, June 12, 1953, 6/19/54
HAN-50834 Bluenose experiment analytical results
HAN-50858 Forecast of slugs shipments to Arco, 6/23/53
HAN-50951 Bluenose Experiment Analytical Results, 6/23/53
HAN-51111 Bluenose Analytical Results-V, 7/2/53
HAN-51053 Shipments to Arco, 7/8/53
HAN-51152 Bluenose analytical results
HAN-51167 Bluenose results, 7/17/53
HAN-51295 Calculations and evaluations of Bluenose results, C.A.Bennet, 7/24/53 [HW-28814]
HAN-51294 Statistical analysis of project Bluenose uranium results, 7/22/53
HAN-51552 Calculations & Evaluations of Bluenose Results, 8/11/53
HAN-51617 Calculations & Evaluations of Bluenose Results, 8/19/53
HAN-51624 Calculations and evaluations of Bluenose results, 8/19/53
HAN-52662-1 Forecast monthly shipments to ICPP, 11/13/53
HAN-52662 Forecast of Spent Fuel Shipments from Hanford and Savannah River to ICPP 1954 through 1955, 11/9/53
HAN-52743 Shipments of Irradiated Enriched Uranium fro Hanford to ARCO, 11/17/53
HAN-52804 Calculations of KR-85 Releases, Bennett, 11/23/53
HAN-52865 Forecast of Spent Fuel Shipments from Hanford to ICPP, 12/1/53
HAN-53114 Bluenose Experiment Data (Kinderman), 12/22/53
HAN-53121 Shipments of Irradiated Enriched Uranium from Hanford to ARCO, 12/21/53
HAN-53403 Statistical Analysis of Project Bluenose P Result (Tingey), 12/23/53
HAN-53691 Off Gas Approval at Idaho CPP (English), 2/5/54
HAN-53725 Shipment of Irradiated J Slugs from Hanford to Arco, 2/10/54
HAN-53734 Shipment of Irradiated Enriched Uranium to Arco, 2/10/54
HAN-53823 Shipment of Irradiated J Slugs from Hanford to Arco, 2/18/54
HAN-53842 Krypton Releases from Idaho (Kavanagh), 2/15/54
HAN-53915 RaLa Program, 2/26/54
HAN-53928 Shipment of Irradiated J Slugs from Hanford to Arco, 2/23/54
HAN-53988 Bluenose Program (Sturges), 3/1/54
HAN-54022 Criticality Considerations for ICPP Modifications, 3/5/54
HAN-54096 Bluenose Program, 3/10/54
HAN-54108 Shipment of Irradiated Enriched Uranium to Arco, 3/12/54
HAN-54190 Off-gas Removal at Arco Chemical Plant, 3/16/54
HAN-54190-1 Release of Krypton 131 & 133 from Proposed Increased Production at ICPP, 2/10/54
HAN-55305 Design basis for ICPP modifications, 6/7/54

HAN-55522 Transmittal of Bluenose Documents, 6/29/54
HAN-55621 Constants for Bluenose Data, 7/8/54
HAN-56557 Scheduling RaLA Shipments, 7/30/54
HAN-56895 Project Bluenose Future Plans, 10,27,54
HAN-57146 Bluenose Slug Experiment, 10,21,54
HAN-57773 ICPP Experience with Extruded J Slugs, 1/12/55
HAN-57773-1 ICPP Experience with Extruded J Slugs, 12/1/54
HAN-57932 Forecast of Loads for ICPP, 2/3/55
HAN-58009 History of Hanford Slugs Processed at ICPP During Jan 1955, 2/10/55
HAN-58025 Shipment of J Slugs to Arco, 2/10/55
HAN-58154 Shipment of J Slugs to Arco, 2/28/55
HAN-58223 Accuracy of Bluenose Experiment, 3/4/55
HAN-58264 Preparation of ICP release data, 3/9/55, Bennett, [HW-35693]
HAN-58488 Preparation of ICP Release Data, 3/18/55
HAN-58724-1 Idaho Chemical Processing Plant Unit Processing Cost Data, 1/14/55
HAN-58908 Transmittal of ICPP Cost Data, 4/26/55
HAN-59174 Review of Bluenose Program, 5/26/55
HAN-59246 Recommendation of Slugs for Dissolution Project Bluenose, Bennett, 6/2/55
HAN-59297 Bluenose Experimental Cost, 6/8/55
HAN-59448 Selection of Slugs for Bluenose and Related Programs, 6/22/55
HAN-59467 Selection of Slugs for Bluenose and Related Programs, 6/22/55
HAN-59635 Calculations of Idaho Releases, 7/14/55
HAN-59635-1 Calculations of Idaho Krypton & Xenon Releases, 7/14/55
HAN-59663 Shipment of Bluenose Slugs, 7/19/55
HAN-59957 Statistical Aspects of the Analytical Program for Bluenose Slugs, 7/22/55
HAN-60324 Calculations & Reporting of Hanford & ICPP Releases, 9/22/55
HAN-60656 ICPP releases, 10/28/55, C.A. Bennett
HAN-60658 Americium-Curium Correction in Bluenose P Assay, 10/14/55
HAN-60987 Hanford Material Processed at CPP, NRTS, 12/8/55
HAN-61431 Selection of Slugs for Bluenose Related Programs, 1/1/56
HAN-61434 Selection of Slugs for Bluenose Related Programs, 1/31/56
HAN-61693 Idaho Releases from Hanford Materials, 2/28/56
HAN-61940 J and C Slugs Shipments to the ICBP, 3/26/56
HAN-62172 Shipment of ruptured C and J Slugs to Arco, 4/18/56
HAN-62447 Calculations of Bluenose Releases, 5/15/56
HAN-62451 Reporting Bluenose Releases, 5/15/56
HAN-62452 Shipment of Bluenose Experimental Slug Samples, 5/14/56
HAN-62661 Bluenose release calculations 6/8/56
HAN-62842 Bluenose Releases at Idaho, 6/27/56
HAN-62850 Reporting Bluenose Releases, 6/28/56
HAN-62997 Gaseous Fission Product Release, 7/20/56
HAN-62998 Bluenose releases at Idaho 7/20/56
HAN-63118 ICPP Release Data, J. Jaech, 8/3/56
HAN-63167 Bluenose releases at Idaho 8/7/56
HAN-63190 Reporting Bluenose releases 8/10/56
HAN-63257 Reporting Bluenose Releases, 8/16/56
HAN-63257-1 Gaseous fission product release , 8/10/56
HAN-63384 Gaseous fission Product released (VA-142-56A), 8/6/56
HAN-63432 Thorex Bluenose Releases, 9/6/56
HAN-63460 ICPP releases of Hanford Material July 1956, J. Jaech, 9/14/56 [HW-45549]
HAN-63536 Summary of ICPP KR-85 Releases, 9/19/56

HAN-63536-1 Summary of ICPP Releases July 1955 - June 1956 9/18/56
HAN- 63536-2 SRP Materials Processed at Arco, 9/19/56
HAN-63584 Hanford Slugs released to ICPP, Bennett, 9/27/56
HAN-63609 Comparison of HPO and ICPP Release of #Curies for Hanford Irradiated Material Dissolved at ICPP, J. Jaech, 9/28/56, [HW-45721]
HAN-63688 Reporting Bluenose releases , 10/8/56
HAN-63688-1 Gas Release Report, 9/20/56
HAN-63688-2 Gas Release Report, 9/20/56
HAN-63813 Reporting Bluenose releases, 10/22/56
HAN-63997 Shipments to the ICPP, 11/13/56
HAN-64284 Reporting Bluenose Releases, 12/17/56
HAN-64284-1 Gas Release Report, 11/19/56
HAN-64357 Reporting Bluenose releases 12\21\56
HAN-64357-1 Gas Release Report, 12/14/56
HAN-64366 ICPP releases of Hanford Material Aug-Sept 1956, 12/21/56,[HW-47595]
HAN-64978 ICPP Releases of Hanford Material, J. Jaech, 3/7/56 [HW-48912]
HAN-66781 Excerpt HAN 53824-1 Krypton release from Idaho, 2/16/54
HAN-68946 C & J Shipments to ICPP, 5/8/58
*
HW-30440 Statistical Analysis of Project Bluenose Plutonium Result, F. Tingely, 12/23/53
HW-31217 Trip Report visit to Arco, Idaho Installation, R.Bursey, 3/23/54
HW-36076 A compendium of Hanford efforts in support of Bluenose, A.Dunbar, 4/12/55
HW-37030 Recommendation of slugs for dissolution project Bluenose
HW-39688 ICPP Releases, C.Bennett, 10/28/55
HW-44796 ICPP Release Data, J.Jaech,8/3/56
HW-45549 ICPP Release of Hanford Material July 1956, J. Jaech, 9/14/54
HW-45721 Comparison of HAPO and ICPP Release Figures for Hanford, J. Jaech, 9/28/56
HW-47595 ICPP Releases of Hanford Material, August - September 1956, J. Jaech, 12/21/56
HW-49584 Idaho release Calculations for January 1957, J.Jaech, 4/9/57
HW-52265 Summary of ICPP Releases of HAPO irradiated material, July 1956 - June 1957 J. Jaech, 8/26/57
HW-53307 Authorization of Expenditures Project Bluenose AEC, H.Parker, 10/22/57
HW-56232 Idaho Release Calculations through March 1958, J.Jaech, 6/3/58
HW-61661 Iodine Release Information, H. Parker, 8/26/59

**References:**


1.) DERA; Report of the Dose Evaluation Review and Assessment (DERA) Advisory Panel, to the Idaho Department of Health and Welfare, January 1993, Review of INEL Dose Models and INEL Historical Dose Evaluation, Margaret von Braun, Ph.D., P.E. Chair, page 79.

2.) Pacific Northwest Laboratory Annual Report for 1985 to the DOE Office of Energy Research, Part 1, Biomedical Sciences, J.F. Park and Staff Members, February 1986, PNL-5750-PT-1

3.) Advanced Mixed Waste Treatment Project Final Environmental Impact Statement, January 1999, DOE/EIS-0290, page 1-3.

4. INEEL Health Effects Subcommittee Meeting, Idaho Falls, 3/17-18/1999, N.Schwartz Reporting, verbatim transcripts, page 495.

5.) Evaluation of the HEDR Source Term and HTDS Power Calculations, F. Owen Hoffman, SEENS Oak Ridge, Inc., Centers for Risk Analysis, March 1999.

6.) Zerriffi, H., Comments of the Institute for Energy and Environmental Research on DOE INEEL Advanced Mixed Waste Treatment Project, August 1998.

7.) IDO-14553, Chemical Processing Technology Quarterly Progress Report, October - December 1960;
IDO-14534, Idaho Chemical Processing Plant Technical Progress Report for April through June 1959;
IDO-14520, Idaho Chemical Processing Plant Technical Progress Report for January - March 1960
IDO-14540, Idaho Chemical Processing Plant Technical Progress Report for July - September 1960.

8.) IDO-14310, Idaho Chemical Processing Plant Monthly Progress Report, September, 16, 1954.

9.) IDO-14314, Idaho Chemical Processing Plant Monthly Progress Report, October, 16, 1954.

10.) IDO-14566, Containment of Iodine-131 Released by the Rala Process, October 30, 1961, Phillips Petroleum

11.) PTR-122, Idaho Chemical Processing Report for August 1956, September 19, 1956, Phillips Petroleum.

12.) PTR-152, Idaho Chemical Processing Report for November 1956, December 17, 1956, Phillips Petroleum

13.) PTR-163, Idaho Chemical Processing Report for December 1956, January 16, 1956, Phillips Petroleum.

14.) PTR-182, Idaho Chemical Processing Report for January 1957, February 25, 1957, Phillips Petroleum.

15.) Rei-47-57A. CPP Production Weekly Report No. 173, ½- to 2/2/57, February 6, 1957, Phillips Petroleum

16.) Ay-2-60A, CPP Production Weekly Report No.325, December 27 1959 to January 2, 1960 Phillips Petroleum

17.) Ay-9-60A, CPP Production Weekly Report No.326, 1/3-9/60, January 12, 1960, Phillips Petroleum

18.) Ay-24-60A, CPP Production Weekly Report No.329, 1/24-30/60, February 3, 1960, Phillips Petroleum

19.) CPP Production Weekly Report series starting with Ay-9-60A through Ay-68-63A, Phillips Petroleum, Atomic Energy Division Idaho Operations Office U.S. Atomic Energy Commission.

20. Ay-3-62A shows total Ba-140 shipments for 1961 at 406,214 Ci.; and Ay-95-60A shows Ba-140 shipments to Las Alamos at 376,600 Curies

21. Citizens Guide to INEEL, Environmental Defense Institute, Chuck Broscious