



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION V

1450 MARIA LANE, SUITE 210
WALNUT CREEK, CALIFORNIA 94596

May 30, 1986

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MEMORANDUM FOR: Robert E. Browning, Director
Division of Waste Management

THROUGH: Ross A. Scarano, Director
Division of Radiation Safety and Safeguards

FROM: Dean M. Kunihiro
Regional State Liaison Officer

SUBJECT: CONCERNS REGARDING THE SUITABILITY OF HANFORD AS A
HIGH-LEVEL WASTE REPOSITORY

On May 16, 1986, Mr. William Schlax visited the Region V office to express his concerns over the Department of Energy's (DOE) continuing high-level waste repository investigations of the Hanford site. According to Mr. Schlax, there are compelling technical bases to reject Hanford from further consideration. He noted that he has presented testimony to that effect at a public hearing on the DOE Draft Environmental Assessment in Richland, Washington on March 5, 1985 (Enclosure A), and sought assurances that the NRC be aware of and evaluate the issues set forth in his testimony. While briefly reviewing his technical rationale, he reiterated grave concern over the continued expenditure of "millions of dollars" studying a site which, according to him, has obviously little, if any, technical merit based on already known geologic information about the site.

One of his purposes in visiting the Regional office was to voice his concerns with appropriate NRC officials. I advised him that the NRC high-level waste program was managed by the Office of Nuclear Materials Safety and Safeguards, and assured him that his concerns would be forwarded to that office.

Also enclosed is an abstract from the paper entitled, "Unsuitability of Hanford, WA site for a nuclear waste repository," which Mr. Schlax has submitted for presentation at the annual meeting of the Association of Engineering Geologist.

Dean M. Kunihiro
Regional State Liaison Officer

Enclosures:
As stated

cc w/o enclosures:
W. N. Schlax

WM Record File
101.3

WM Project 10

Docket No. _____

PDR

LPDR (B)

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PDR WASTE
WM-10

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Distribution:

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ENCLOSURE A

Public Reading Room

Rockwell Hanford Operations
Energy Systems Group
Richland, WA 99352



Rockwell
International

March 27, 1985

Mr. William Schlax:

Attached is the copy you requested of your testimony from the March 5, 1985 hearing on the Draft Environmental Assessment of the Hanford Site. As you requested, I sent a copy of your testimony to Mr. Tim Peckinpaugh of Congressman Morrison's staff.

Terri Traub
Terri Traub
Public Document Reading Room
Federal Building, Room 157
P. O. Box 809
Richland, WA 99352
(509) 376-8583

84-8000-084 (R.8-78)

PUBLIC HEARING

Re: Draft Environmental Assessments
for Proposed Site Nominations

Meeting held at the Main Auditorium,
Federal Building, Richland, Washington,

on

Tuesday, March 5, 1985,

from

7 to 10 PM

Volume II of II

Presiding Official: Mr. Ellison Burton, Department of Energy

Moderator: Dr. William Clarke, Gonzaga University

Panel Members: Mr. Eugene Pride, Department of Energy

Ms. Mary Lynn Merriman, American Association of University Women

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NATIONAL CERTIFICATE OF MERIT

1 at nuclear power plants in just the United States
2 occurred and were documented.

3 I hope that efforts by HEAL, the Spokane City
4 Council, the state of Washington (now in litigation
5 with the Department of Energy), the Washington Public
6 Interest Research Group, the Sierra Club, the
7 Audubon Society, Physicians for Social Responsibility,
8 among others, are just the beginning in helping restore
9 safety and environmental integrity to not just Eastern
10 Washington, but to Nevadans and to Texans, Texans and
11 beyond, to all the countries of the world now
12 subjugate to nuclear energy and nuclear weapons.

13 In no way is my position to be construed as a
14 plea for safer nuclear facilities. It is my prayer
15 and desire that society recognizes that gains are far
16 overshadowed by losses -- some losses eternal -- from
17 the nuclear industry.

18 I'd like to thank the DOE for the opportunity
19 to participate in this hearing.

20 MR. CLARKE: Thank you, Mr. Johnson.

21 (Audience applauded.)

22 MR. CLARKE: Mr. William Schlax?

23 MR. SCHLAX: My name is William Schlax. I'm an
24 engineering geologist holding California Certificate
25 No. 28. I've had 37 years' experience in petroleum,

1 groundwater, and engineering geology. I am co-author
2 of the U.S. Geological Survey report on The Geology and
3 Groundwater^{As} Sources of the Wenas Creek Valley near
4 Yakima, which is referenced in the Environmental
5 Assessment.

6 In my written statement, I will be referring to
7 the Environmental Assessments indicated water pressure
8 of 1400 pounds per square inch, which for comparison
9 is, I understand, four or five times higher than
10 modern submarines can resist.

11 This is my written statement:

12 At Hanford it is proposed to construct a nuclear
13 waste storage site in one of four flat-lying,
14 fractured and jointed basalt lava flows which range
15 in thickness from 89 to 270 feet and are at a depth
16 of about 3800 feet below the ground surface. The
17 water table is about 165 feet below the ground surface.

18 The waste site resembles a large underground mine
19 with a complex of tunnels 10 feet and 14 feet high,
20 extending over an area of 2000 acres, or about
21 3 square miles. Construction will be done by blind
22 drilling a vertical shaft with a rotary drill rig,
23 using drilling mud and cementing a steel casing against
24 the bedrock strata from the ground surface down
25 through the basalt flow. Drilling mud will then be

1 pumped out of the vertical shaft and be replaced by
2 air at atmospheric pressure of about 16 pounds per
3 square inch. Tunnels will be extended horizontally
4 from the shaft into the fractured basalt flow by the
5 usual mining methods of drilling and blasting.

6 Prolific groundwater aquifers above and below
7 the fractured basalt flow contain enormous volumes
8 of valuable groundwater at a pressure of about 1400
9 pounds per square inch, as compared to the tunnels
10 to be constructed, which must be kept filled with air
11 at 16 pounds per square inch for up to 90 years.

12 Should there ever be any significant, abrupt entry
13 of groundwater through the fractured basalt into the
14 air-filled tunnel complex anywhere in the 2000-acre
15 site, the entire complex might be flooded in minutes
16 and rendered useless, with probable loss of life of
17 all underground personnel.

18 To grout, freeze, or otherwise seal off such
19 groundwater entering at 1400 pounds per square inch
20 is probably not possible. To pump out such water
21 entering from large aquifers covering many square miles
22 is probably not possible or feasible. If possible,
23 such pumping would have to be continuous for up to
24 90 years. This would cause regional lowering of the
25 water table. When pumping ceased, the waste material

1 would be enclosed within and no longer isolated from
2 the regional groundwater system.

3 Significant entry of groundwater at 1400-pound
4 per square inch pressure into the air-filled tunnels
5 somewhere over the 2000-acre site in the 40 years of
6 construction and operation appears inevitable. Because
7 the air-filled tunnel complex would be closely
8 surrounded by fractured basalt and enormous volumes
9 of valuable groundwater at 1400-pound per square inch
10 pressure, the Hanford Site does not qualify as a
11 suitable site for a nuclear waste repository.

12 And I'd like to add some separate comments:

13 The Environmental Assessment presents some adequate
14 geologic data and then, in my opinion, completely
15 misjudges its significance. An example, on page 6-184
16 of the Environmental Assessment, quote, the potential
17 exists that a highly transmissive water-bearing zone
18 may be penetrated that would produce large water inflows
19 under high pressure, unquote. Later on the same page,
20 they state, quote, ample technology exists to grout
21 and seal such zones and alternately draw down the
22 water source to assure the excavation would not be
23 flooded. unquote

24 I find it difficult to find words as to how much
25 I'm opposed to that assumption of theirs. I believe

1 you can grout very high pressures in an oil well, a
2 narrow shaft with a steel casing, and you've got almost
3 any pressure you want between the casing and the
4 formation. But to grout it, open fractured basalt
5 tunnels, against water pressures of 1400 pounds per
6 square inch -- five times what a modern submarine
7 could stand -- it just sounds inconceivable, or how
8 you could possibly get equipment into those tunnels
9 to even begin to do it.

10 And then to consider drawing down the water source,
11 we're talking about a lift, a vertical lift of 3800 feet.
12 Lifting the water 3800 feet, at the bottom of any pump
13 shafts ^{on} of the pumping equipment, the pressure's going
14 to be 1400 pounds per square inch -- five times what
15 a submarine can stand.

16 How many pumps will you need around this 3-square
17 mile perimeter? How many shafts and how many pumps?
18 And this is going to be up to ^{for} 90 years?

19 What is it going to cost to install all these
20 shafts and pumps and to pump this water for many, many
21 years and lower the water table? It will be
22 astronomical, the costs for equipment and power. It's --
23 to me it's just incredible.

24 I would like to go on to the specific things that
25 I believe would disqualify the site, and the first

1 would be under "Environmental quality," where it states:

2 "During repository siting, construction,
3 operation, closure, or decommissioning the
4 quality of the environment in the affected
5 area could not be adequately protected or
6 projected environmental impacts in the affected
7 area could not be mitigated to an acceptable
8 degree, taking into account programmatic,
9 technical, social, economic, and environmental
10 factors."

11 Now, this incredible proposal to store such
12 poisonous wastes inside one of the largest bodies of
13 usable groundwater in the Pacific Northwest with
14 eventual, almost certain contamination of the ground-
15 water, eventually the Columbia River, even into the
16 Pacific Coast along the ocean, to me that disqualifies
17 it for that point.

18 The next point would be "Socioeconomic impacts":

19 "Disqualifying Condition. A site shall
20 be disqualified if repository construction,
21 operation, or closure would significantly
22 degrade the quality, or significantly
23 reduce the quantity, of water from major
24 sources of offsite supplies presently
25 suitable for human consumption or crop
irrigation and such impacts cannot be
compensated for, or mitigated by, reasonable
measures."

Well, this almost certain entry of groundwater and
the many years of pumping are certainly going to reduce
usable groundwater supply, so I believe that is certainly
enough to disqualify it on that basis.

With regard to "Rock characteristics," a
disqualifying condition:

1 "The site shall be disqualified if the
2 rock characteristics are such that the
3 activities associated with repository
4 construction, operation, or closure are
5 predicted to cause significant risk to
6 the health and safety of personnel, taking
7 into account mitigating measures that use
8 reasonably available technology."

9 I believe the fractured nature of the rock, the
10 potential for bursting, which is made very clear by
11 Don White of the USGS, and combined with the 1400-pound
12 per square inch water pressure over that whole site, it
13 would be a perilous operation for anyone to ever be in
14 that site.

15 My personal opinion is that you cannot have
16 3 square miles of these basalt flows with that kind of
17 water pressure into an air-filled tunnel. I don't
18 think the site even could be constructed really. I
19 think the inflows of water would be so enormous, it
20 would just be a washed-out project. But if you were
21 able to construct a dry tunnel, which almost, in effect,
22 is putting it under 3800 feet of ocean water, it's
23 just incredible to think that water at 1400 pounds per
24 square inch isn't going to come through those fractured
25 basalt flows. I'm sure you've all seen the fractured
basalt flows in Wallula Gap or between Ellensburg and
Yakima. That's just the way they are, and they're
not going to take that kind of pressure.

The next -- the last one would be "Hydrology."

1 The disqualifying condition:

2 "A site shall be disqualified if, based
3 on expected ground-water conditions, it
4 is likely that engineering measures that
5 are beyond reasonably available technology
6 will be required for exploratory-shaft
7 construction or for repository construction,
8 operation, or closure."

9 I don't think they would have too much trouble
10 cementing the steel casing from the surface down, but
11 I don't think they'd ever be able to handle that water
12 or depth at that kind of pressures: not over a 40-year
13 period, or possibly 90, which is supposed to be able
14 to be recovered.

15 In summary, I'd say that future generations would
16 be poorly served by this site. And if you think WPPSS
17 was a disaster, wait until you begin paying for this
18 financial and ecological disaster.

19 (Audience applauded.)

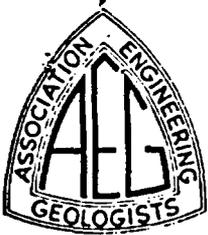
20 MR. CLARKE: Eugenia Meeker?

21 A SPEAKER: Can you have that fellow turn that
22 light off over there? It's awful bright. It's
23 hitting us right square in the eyes.

24 NEWS REPORTER: We're going to turn it off in
25 about two minutes, or 30 seconds.

MS. MEEKER: Good evening. I'm Eugenia Meeker
from Yakima.

I think technology has been dealt with so



Association of Engineering Geologists



1986

ANNUAL MEETING

ANNUAL MEETING COMMITTEE

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April 24th, 1986

Mr. William Schlax
508 Buena Vista Dr.
Santa Rosa CA
95404

Dear Mr. Schlax

We are pleased to have received your abstract for the 1986 AEG National Meeting. Your abstract titled,

Unsuitability of Hanford, Washington site for a nuclear waste repository

has been forwarded to our selection committee for review. The final selection of papers to be presented will be made by the end of May, and you will be notified of the results by mid-June.

Thank you for your participation. If you have any questions, please call me at 408-984-1336.

Sincerely,

1986 AEG ANNUAL MEETING COMMITTEE


R. Rexford Upp
Program Chairman

Association of Engineering Geologists
1986 29th Annual Meeting

UNSUITABILITY OF HANFORD, WASHINGTON SITE FOR A
NUCLEAR WASTE REPOSITORY

SCHLAX, William N., Retired

508 Buena Vista Drive, Santa Rosa, CA 95404

At Hanford, it is proposed to construct a nuclear waste storage site inside one of the largest bodies of usable groundwater in the Pacific Northwest. The site would be a 2000 acre tunnel complex, inside one of four flat-lying, fractured and jointed basalt lava flows. These flows range in thickness from 89 to 270 feet, and are at about 3800 foot depth. The water table is about 165 foot depth.

The horizontal tunnel complex, open by vertical shaft to the surface, would contain air at atmospheric pressure of 16 psi. It would be closely surrounded by fractured basalt and prolific aquifers containing enormous volumes of valuable groundwater at 1400 psi pressure.

To seal off and/or pump out expected large inflows of groundwater at 3800 foot depth for up to 90 years, is probably not possible and/or feasible. Significant, abrupt entry of groundwater, anywhere in the site, in the 40 years of construction and operation, might flood the entire complex in minutes and render it useless, with probable loss of life of all underground personnel.

There would be almost certain contamination of the groundwater and eventually of the Columbia River.

The Hanford site is unsuitable for a nuclear waste repository.

Speaker William N. Schlax

AEG MEMBER - EM

Not available to serve as co-chairman.

Phone number: 707-542-0837 available most evenings.

ORAL--