



Texas Department of Health

William R. Archer III, M.D.
Commissioner

1100 West 49th Street
Austin, Texas 78756-3189
(512) 458-7111

Patti J. Patterson, M.D., M.P.H.
Executive Deputy Commissioner

Radiation Control
(512) 834-6688

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Nov 2
OSP

October 22, 1999

**UNITED STATES NUCLEAR REGULATORY COMMISSION
ATTN PAUL H LOHAUS DIRECTOR
OFFICE OF STATE PROGRAMS
MAIL STOP O3H20
WASHINGTON D C 20555**

Dear Mr. Lohaus:

This letter is in response to your request for clarification of information sent to you regarding the request for concurrence of termination of the Westinghouse (WEC) Uranium Projects, Radioactive Material Licence (RML) L02537. In the information sent there was an indication that the Texas Natural Resource Conservation Commission (TNRCC) had an action pending relating to the termination of the project. The pending action was the termination of the of the RML by the TNRCC. Since that report was written the authority to license uranium mining projects (and to terminate) was transferred to the Texas Department of Health (TDH). When the program was transferred to TDH the pending action was also transferred and has been sent to you for concurrence.

Regarding the concerns raised in the TNRCC report included with our termination concurrence request I would like to address those that have been brought to our attention as needing further clarification. After a careful review of the WEC file and conversations with the parties involved it is my conclusion that the issues raised by TNRCC have all been addressed or had no bearing on the release of the site. To address specific concerns I submit the following information:

TNRCC raised a concern about an area with a reading of 10,000 cpm that was located during the TDH concurrence survey. According to the personnel who performed the survey the spot was very small and was removed by the licensee during the survey. A follow up survey of the area failed to detect any contamination above background. TDH personnel felt that it would have been a waste of resources to sample the area involved since it was apparent that the contamination had been removed. Additionally TNRCC personnel attempted to located the hot spot and were unable to do so.

TNRCC raised a concern about the number of samples taken from the former plant pad area. According to the personnel who performed the survey the entire plant pad area was subjected to a very detailed gamma survey (on their hands and knees was the phrase used by the surveyors) utilizing 1x1 Sodium Iodide and pancake probes. There were 2 issues which dictated that only one sample be taken from the area:

1. The survey was very intense and failed to detect any contamination; and
2. The area of the former plant pad was a very hard packed caliche material which was incredibly difficult to sample. It was felt that because of the relatively impermeable nature of the caliche it was improbable that contamination was able to penetrate the pad and only one sample was needed.

TNRCC also raised concerns about buildings left on the site at the landowners request. All buildings were surveyed by TDH personnel at the time of the concurrence survey and swipe samples were taken where appropriate. No contamination was found during TDH's concurrence survey as was stated in our report. Also according to our records and the licensee only 3 buildings remain on site not 6. TDH does not require that a licensee request concurrence for release equipment or material from the site. As the licensee dismantled the buildings and the material surveyed the material prior to disposal TDH would not have performed a concurrence survey.

Regarding the wellfield samples discussed on the first page of the TDH memo of December 6, 1993 the following should be noted:

1. When sampling a wellfield natural uranium is generally not the isotope of concern. It has been found in the past that if radium concentrations meet the release criteria uranium concentrations will as well.
2. Uranium concentrations are determined on all samples taken and a site will not be released unless all parameters meet release criteria.

Finally there seems to be some confusion regarding the first paragraph of the second page of the letter dated January 20, 1999. Upon review it appears the cause of the confusion was the attempt to consolidate all of the surveys in one paragraph and the use of a standard "boilerplate" paragraph. I would like to submit the two revised paragraphs below to reflect a more exact description of the release process.

Item 5

1. In May 1993, TDH personnel performed confirmatory surveys of the wellfield. The surveys were performed using one-by-one sodium iodide probes and Ludlum 14C survey meters. The survey was performed by walking 10 meters apart moving across the wellfield pattern (Regulatory Guide 5.10, Guidelines for Conducting Close Out Surveys of Open Lands and Requesting Release for Unrestricted Use). Background readings were approximately 1200 cpm on all meters. Survey readings across the wellfield were fairly uniform ranging from 3000 to 5000 cpm. The wellfield had been decontaminated using an approved soil washing method and the "washed" soil spread evenly across the wellfield (samples of the "washed" soil at the end of the process indicated that average radium and uranium concentrations were below or equal to the release criteria of 5 pCi/g and 30 pCi/g, respectively) which explains the uniform survey readings across the wellfield. Soil samples were taken from a ten meter by ten meter area around four areas in the wellfield. Analysis of 3 samples indicated that average radium and uranium concentrations were below or equal to the release criteria of 5 pCi/g and 30 pCi/g, respectively.

One sample exceeded the release criteria of 5 pCi/g for radium and was decontaminated by the licensee and later resampled by TDH personnel. Analysis of the sample indicated that average radium and uranium concentrations were below or equal to the release criteria of 5 pCi/g and 30 pCi/g, respectively

2. In August 1993, TDH personnel performed confirmatory surveys of the plant facilities. The surveys were performed using one-by-one sodium iodide and GM pancake probes and Ludlum 14C survey meters. The survey was performed by walking 10 meters apart moving across the wellfield pattern (Regulatory Guide 5.10, Guidelines for Conducting Close Out Surveys of Open Lands and Requesting Release for Unrestricted Use). Background readings were approximately 1200 cpm on all meters. Survey readings across the facility ranged from 1000 to 5000 cpm. Soil samples were taken from a ten meter by ten meter area around five areas in the facility and one area in the center of the plant pad. Analysis of all samples indicated that average radium and uranium concentrations were below or equal to the release criteria of 5 pCi/g and 30 pCi/g, respectively.

As maintaining this site places an undue economic burden and hardship on the licensee we request expeditious processing of this request.

If you have any questions, please call me at (512) 834-6688 extension 2208.

Sincerely,



Eugene (Gene) Forrer
Chief, Uranium Licensing Project
Division of Licensing,
Registration, and Standards
Bureau of Radiation Control

Enclosure 1

TEXAS WATER COMMISSION

8-2537
if [unclear] SKWS

Paul Hopkins, Chairman
Ralph Roming, Commissioner
John O. Houchins, Commissioner



C. Martin Wilson III, General Counsel
James K. Rourke, Jr., Chief Examiner
Mary Ann Hefner, Chief Clerk
BKR

Larry R. Soward, Executive Director

July 24, 1987

'87 JUL 29 AM 11 19

Mr. Carleton Rutledge
Westinghouse Electric Corporation
Uranium Resources Division
Box 3912
Pittsburgh, PA 15230-3912

URGENT
RADIATION CONTROL

Re: Restoration Determination,
Westinghouse Electric Corporation,
Bruni Mine Site, Production Area 5, Part 1,
Permit No. URO1942-051,
Webb County

Dear Mr. Rutledge:

The Texas Water Commission has received the three consecutive sampling sets as required by TAC 331.107. A review of the restoration data indicates that Production Area 5, Part 1, at the Bruni Mine Site has been restored in accordance with the specifications contained in permit number URO1942-051 and as required by 31 TAC Section 331.107. You are hereby authorized to cease any restoration activities, including monitoring, at Production Area 5, Part 1.

Within 120 days of receipt of this letter, closure of the wellfield shall be accomplished in accordance with the approved plugging and abandonment plans submitted as part of the permit application with the exception of wells E-1, 8M-3, E-4 and 8M-4. These wells are to remain open until a future date for the purpose of additional aquifer observation. Any modification to plugging and abandonment procedure must be approved in writing by the Commission. Please notify the Commission prior to commencing plugging activities.

If you have any questions please contact Katherine Nelson of the In Situ Uranium Mining Unit at 512/463-8274.

Sincerely,

Larry R. Soward
Executive Director

cc: TWC District 11 Office - Weslaco
Mr. David Lacker, Chief, Bureau Radiation Control, Texas Deptment of Health

TEXAS WATER COMMISSION

B. J. Wynne, III, Chairman
Paul Hopkins, Commissioner
John O. Houchins, Commissioner



Allen Beinke, Executive Director
Michael E. Field, General Counsel
Karen A. Phillips, Chief Clerk

November 15, 1988

CC: T. R. Iner
C. Mancuso
A. Gleghern - BRUNI
D. Loera - BRUNI
A. J. Nardi - EC 268E
MIS 2-25
FILE: TXB 2.1.1

Mr. Carleton Rutledge
Westinghouse Electric Corporation
Uranium Resources Division
P.O. Box 3912
Pittsburgh, Pennsylvania 15230-3912

Re: Restoration of Production Area No. 5, Part 2
Bruni Mine Site, Permit No. URO1942-051

Dear Mr. Rutledge:

The staff of the In Situ Uranium Mining Unit has reviewed the final restoration data presented to the Texas Water Commission for Production Area No. 5, Part 2. Considering this information and the additional material presented at the meeting on November 10, 1988 between representatives of the TWC and WEC, the staff has determined that WEC has sufficiently restored the production zone aquifer at Production Area No. 5, Part 2. With the exception of well VI-5, WEC may commence plugging the wells in this production area.

As agreed during the November 10 meeting, WEC will begin pumping well VI-5 immediately. The WEC representatives indicated that the anomalously high restoration parameter values found in this well are the result of leakage from the overlying aquifer through channels in the casing cement. The well is to be pumped to decrease these values prior to plugging. The TWC is to be kept advised of the conductivity and uranium values of the water recovered from the well. These readings are to be made on a regular basis. Pumping will continue until authorization to cement the well is obtained from the TWC. In addition, a section of the aquiclude between the production zone and overlying aquifer is to be underreamed and cemented as agreed at the November 10 meeting, to prevent further the migration of fluids between the two zones.

Please notify the staff of the In Situ Uranium Mining Unit at least one week prior to initiating plugging of the production area to provide the opportunity for TWC personnel to be present. Should you have any questions please contact Ms. Katherine Nelson at (512) 463-8274.

Sincerely,

James Kowitz for
Harry D. Pruett, P.E., Director
Water Rights and Uses Division

KN:aa

NOV 18 1988

Your early review and approval of our enclosed plugging and abandonment plan is requested. If you require further information or explanation, please feel free to phone me at (412) 374-2348.

Sincerely,



Carleton Rutledge, Jr., Manager
Environmental and Regulatory Programs
Uranium Resources Division

/amb

Enclosure

cc: Phil Shaver, TTH-ERC, Austin

file LO2537
Rutledge → [unclear] → [unclear]
F
(LO253)

TEXAS WATER COMMISSION

B. J. Wynne, III, Chairman
Paul Hopkins, Commissioner
John O. Houchins, Commissioner



Allen Beinke, Executive Director
Michael E. Field, General Counsel
Brenda W. Foster, Chief Clerk

December 14, 1988

BUREAU OFFICE

Mr. Carleton Rutledge
Westinghouse Electric Corporation
Uranium Resources Division
P. O. Box 3912
Pittsburgh, PA 15230-3912

'88 DEC 21 AM 11

Re: Plugging of wells E-1, 8M-3, E-4, and 8M-4
Production Area No. 5, Part 1 (Permit No. URO1942-051)

Dear Mr. Rutledge:

In our letter of July 24, 1988, which authorized the plugging of Production Area No. 5, Part 1 at the Bruni Mine it was stipulated that wells E-1, 8M-3, E-4 and 8M-4 were to remain open until a future date. Westinghouse Electric Corporation is hereby authorized to plug these four wells. The wells are to be plugged in accordance with the approved plugging and abandonment procedure.

Should you have any questions please contact Ms. Katherine Nelson at (512) 463-8274.

Sincerely,

Harry D. Pruett
Harry D. Pruett, P.E.
Director, Water Rights and Uses Division

cc: TWC District 11 Office - Weslaco
Mr. David Lacker, Chief, TDH-BRC

TEXAS WATER COMMISSION

Handwritten notes:
R-114
P-5
P-8
E-7
LO253

B. J. Wynne, III, Chairman
John E. Birdwell, Commissioner
Cliff Johnson, Commissioner



John J. Vay, General Counsel
Michael E. Field, Chief Hearings Examiner
Brenda W. Foster, Chief Clerk

Allen Beinke, Executive Director
November 13, 1990

Mr. Carleton Rutledge, Jr., Manager
Environmental and Regulatory Programs
Fuel Cycle Materials and Services Department
Westinghouse Electric Corporation
Box 2728
Pittsburgh, Pennsylvania 15230

Re: Restoration Determination of Production Area No. 3 of the
Bruni Mine Site, Permit No. URO1942-031

Dear Mr. Rutledge:

The Texas Water Commission has received the restoration data and follow-up information for Production Area No. 3 of the Bruni Project. A review of the data indicates that there are some groundwater problems associated with this site which require additional comment.

There are four main areas of discussion at this site. They are: 1) The production zone baseline wells; 2) The production zone monitor wells; 3) The shallow aquifer under holding Pond 5; and 4) The shallow zone monitor wells in the production area. A more detailed discussion of each of these areas follows:

- 1) The average values of the production zone baseline wells are consistent with the values listed in the restoration table in Production Area No. 3. Two baseline wells (P-5 and P-8) however, show abnormally high conductivity values. Evidence suggests that there is leakage from the overlying aquifer into the production zone through annular cracks in the cement. A special plugging procedure should be used on these two wells. The procedure includes underreaming the aquitard between the two aquifers and then filling with cement as had been discussed between Westinghouse and TWC staff in a letter dated August 16, 1990.
- 2) The average values of the production zone monitor wells are consistent with the values listed in the restoration table in Production Area No. 3. Although approximately one third of the wells are over the restoration table value for total dissolved solids (TDS), the other two thirds are under the value. All of the monitor wells are within ranges found at baseline before mining began.

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CONTROL

- 3) In 1976, the shallow aquifer beneath holding Pond 5 was contaminated due to a leaky liner (which was subsequently repaired). A combination of pumping and water flooding was used to clean up the shallow zone. In 1980, an agreement was reached whereby the shallow zone would be cleaned up to a conductivity level of 10,000 umhos/cm. In October 1989, all wells tested below the agreed limit and have remained relatively stable.

- 4) During mining, a number of shallow zone monitor wells in Production Areas 3, 4, and 5 went on excursion for conductivity, ammonia, and uranium. Data indicate that the excursion was due to movement up from the production zone through cracked cement liners or old exploration holes. Currently there are five wells that are still on excursion status, three of which are on excursion due to the high ammonia values. The ammonia values are, however, below 150 mg/l which is the value set in the most recent restoration table amendment (1/31/90) for the production zone restoration values. The other two wells have elevated levels of conductivity and sulfate, but even at baseline, this overlying aquifer was far above any drinking water standards.

However, Westinghouse should continue routine monitoring (in accordance with 31 TAC § 331.105) of these 14 shallow zone centerline monitor wells until such time that the Commission is confident that the water quality has stabilized within a natural range. In the unlikely event that water quality has not stabilized, further restoration of these shallow zone wells may be required.

In accordance with 31 TAC § 331.107(e) you are hereby authorized to cease restoration activities, except for monitoring in the shallow zone, at Production Area No. 3 due to the following justifications:

- The average values for the production zone baseline and monitor wells are consistent with the values listed in the current restoration table and therefore the ground water should be considered restored in accordance with 31 TAC § 331.107(b).

- The water that exists in the shallow zone in the vicinity of the mine is currently unused and unusable based on water quality even prior to mining. Much better quality and quantities of drinking water exist and are available from aquifers below the shallow zone and the production zone.

Mr. Carleton Rutledge
Page Three

- Nearly 51 million gallons of water have been disposed of down a waste disposal well during restoration of this project. An additional 42 million gallons of fresh water were used to supplement clean-up. Any further restoration efforts would consume natural resources of the state without a corresponding benefit to the state.

Closure of the wellfield, except for the monitor wells in the shallow zone discussed in 4) above, shall be accomplished in accordance with the approved plugging and abandonment plans for this Production Area including any special procedures agreed to. Any modifications to these procedures must be approved in writing by the Commission. Westinghouse shall continue routine monitoring of the 14 shallow zone centerline monitor wells in accordance with 31 TAC § 331.105 until written notification is received from the Commission allowing cessation of monitoring and approval for plugging.

Please notify the Commission prior to commencing plugging activities to provide the opportunity for TWC personnel to be present. If you have any questions, please contact Mr. Dale P. Kohler of my staff at 512/371-6322.

Sincerely,



Allen P. Beinke
Executive Director

cc: Mr. David K. Lacker, Chief, Bureau of Radiation Control,
Texas Department of Health, Austin, Texas

TEXAS WATER COMMISSION



Handwritten initials and notes:
JL
RE: 11/2
COR
SE
RW
PA
File

B. J. Wynne, III, Chairman
John E. Birdwell, Commissioner
Cliff Johnson, Commissioner

John J. Vay, General Counsel
Michael E. Field, Chief Hearings Examiner
Gloria A. Vasquez, Chief Clerk

Allen Beinke, Executive Director

April 17, 1991

Eugene J. Miles, Director
Fuel Cycle Materials and Services Department
Westinghouse Electric Corporation
P.O. Box 2728
Pittsburgh, PA 15230

Re: Westinghouse Electric Corporation's shallow zone monitor wells at the Bruni Site

Dear Mr. Miles:

The Commission has received the latest quarterly report information regarding the five shallow zone monitor wells which are on excursion. According to the letter dated November 13, 1990 from the Commission to Mr. Carleton Rutledge, these five wells were to remain open (unplugged) until such time that the Commission felt confident that the water quality had stabilized within a natural range. The submitted data appear to indicate that the water quality monitored by these wells has stabilized. Therefore further monitoring of these wells is not required.

You are hereby authorized to plug the remaining fourteen shallow zone monitor wells, including the five wells on excursion status in accordance with your approved plugging and abandonment plans for this Production Area.

Please notify the Commission prior to commencing plugging activities to provide the opportunity for TWC personnel to be present. If you have any questions, please contact Mr. Dale P. Kohler of my staff at 512/371-6322.

Sincerely,

Handwritten signature of Harry D. Pruett
Harry D. Pruett, P.E., Director
Water Rights and Uses Division

HDP/DPK/km

cc: David K. Lacker, Chief, Bureau of Radiation Control
Texas Department of Health, Austin, Texas

TABLE A

INFORMATION ON PLUGGING INJECTION WELLS - BRUNI MINE SITE**I. PLUGGING AND ABANDONMENT PLAN (For Production Zone Monitor Wells, Production Zone Injection and Recovery Wells, and Deep Monitor Wells.)****1. Type and number of plugs to be used:**

There will be one continuous cement plug from the bottom of the hole to the surface where the casing will be cut off three to four feet below grade or at the cap rock (caliche), whichever is nearer the surface. (See Figure I)

2. Position of each plug:

From bottom of hole or under-ream zone to surface.

3. Type, grade and quantity of plugging material:

Per 100 ft. of 4-1/2 inch inside-diameter casing, 8.7 sacks Class A cement (94 lbs. each), 0.35 sacks Aqua-Gel (100 lbs. each), an 0.25 sack of Mica-Tex, adjusted to achieve a density of 12.6 to 13.0 lbs. per gallon. (This formula provides about 10 to 15% excess to ensure adequate working quantities.)

4. Placement of Plugs:

The cement will be batch-mixed and pumped into the top of the well so it flows to the bottom. With the average water level at Bruni at approximately 85 feet below the surface, the 12.6 lb/gal cement will force the water back into the formation and ensure a continuous plug without cavities.

The 12.6 lb/gal cement slurry will develop a pressure of 0.655 psi/ft of depth, imposing a pressure of 56 psi at 85 feet below surface, more than enough to force the water back into the formation yet not so much as to rupture the well casing.

At Bruni, there are two aquifers of concern: (a) the gravel layer (about 45 feet below surface) at the bottom of the Goliad formation and (b) the host aquifer (about 145 feet below surface), a sandy clay at the top of the Catahoula formation.

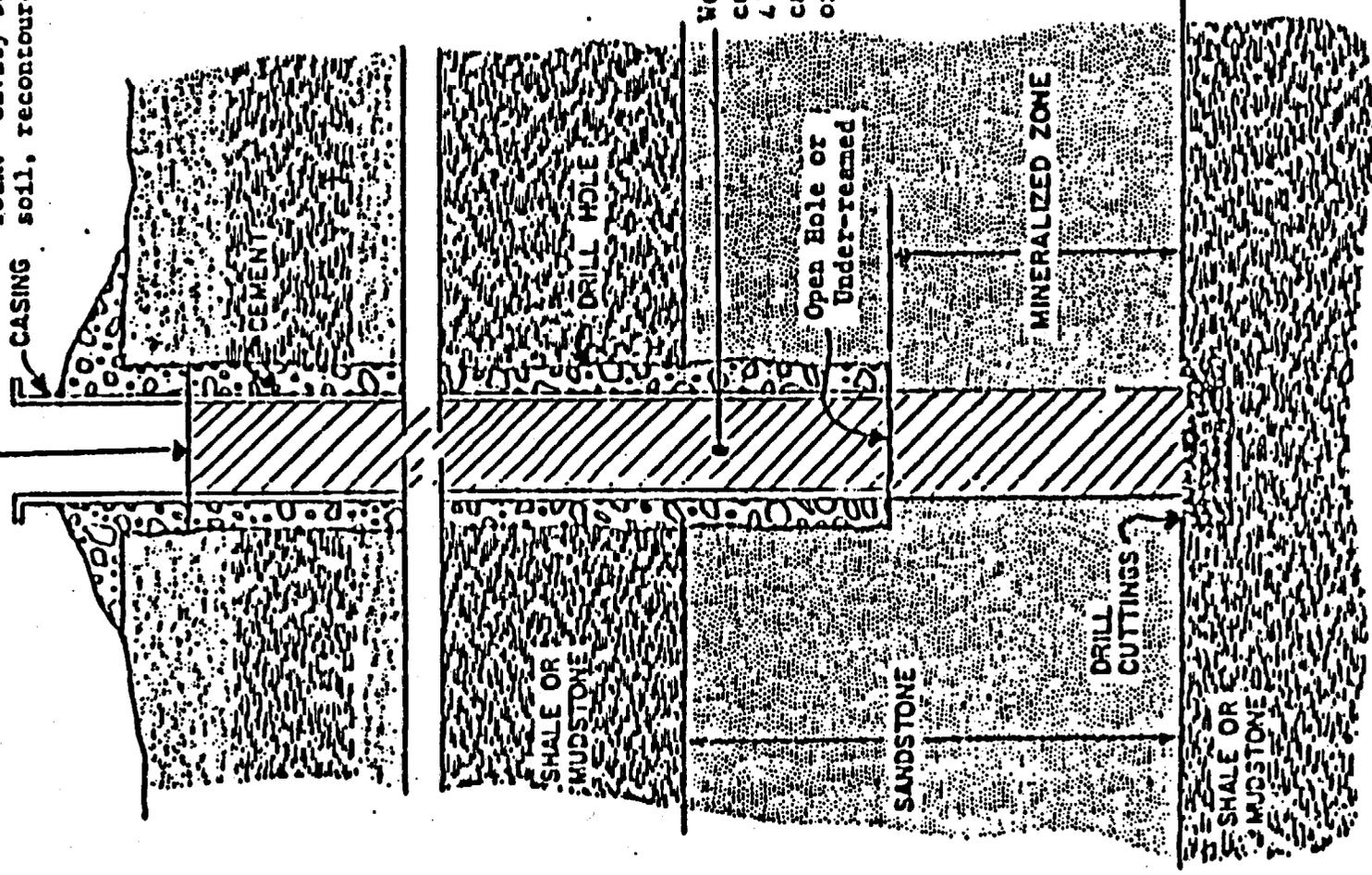
5. Procedure of plugging and abandoning:

After the cement is set, additional cement will be added to compensate for shrinkage. The top of the casing will be cut and removed. The cavity will be back-filled and the surface recontoured with adjoining surfaces. The surface will be seeded after the completion of survey and decontamination procedures required by the Texas Department of Health.

II. PLUGGING AND ABANDONMENT PLAN (For All Shallow Zone Wells)

1. The casing will be cut off three to four feet below grade or at the cap rock (caliche), whichever is nearer the surface.
2. A Schedule-40 PVC end-cap will be cemented onto the top of the casing and the cavity will be back-filled to grade and the surface recontoured with adjoining surfaces. The surface will be seeded after the completion of survey and decontamination procedures required by the Texas Department of Health.

Casing and cement cut off at
3-4 ft below surface or at cap
rock. Cavity backfilled with
soil, recontoured, and reseeded



Well-plugging
cement from 3' to
4' below grade c
cap rock to bott
of hole.

FIGURE I SOLUTION MINING WELL CONSTRUCTION DIAGRAM
Showing Well-Plugging as Planned for the Brumfi Site;

Enclosure 2

CR-132-7

Westinghouse
Electric Corporation



Uranium Resources Division

Box 3912
Pittsburgh Pennsylvania 15230-3912

77 NOV 23 11 35

November 20, 1987

CONTROL

Mr. David K. Lacker
Texas Department of Health
Bureau of Radiation Control
1100 W. 49th Street
Austin, TX 78756

Attention: Mr. Warren Snell
Division of Licensing, Registration and Standards

Dear Mr. Snell:

Subject: Facility Decommissioning Plan
Bruni Mine Site (RML No. 8-2537)

Westinghouse Electric Corporation submits herewith its Facility Decommissioning Plan for radioactive decontamination and closure of our Bruni site. This is provided in accordance with discussions during our meeting with you and other Bureau of Radiation Control staff personnel in Austin on July 24, 1987 and TRCR 21.307(d).

Your earliest approval is requested in light of the threatened closure of the Conoco Conquista tailings pond, the only Texas low level waste disposal site licensed and available to us in the foreseeable future.

If you require further information, please do not hesitate to phone me at (412) 374-2348 or our corporate radiation control officer, Mr. Nardi, at (412) 374-4652.

Sincerely,

C. Rutledge, Jr.
Manager, Environmental and
Regulatory Programs
Uranium Resources Division

CR:bmf

WESTINGHOUSE ELECTRIC CORPORATION
Bruni Mine Site
Bruni, Texas

FACILITY DECOMMISSIONING PLAN

Objective:

Westinghouse Electric Corporation intends to decommission its Bruni Mine Site, terminate its Radioactive Materials License No. 2537, and return the property to the landowner. This is to be accomplished in accordance with the requirements of the Texas Department of Health as promulgated in the Texas Radioactive Control Regulations.

Scope of Work:

The sequential restoration of groundwater quality as required by the Texas Water Commission is in progress. Westinghouse is dismantling well fields, plugging and abandoning injection/recovery wells, and decontaminating the surface. Equipment, structures, and other facilities in the process area will be dismantled when no longer needed. After being cleared, the process area's surface, like the well fields, will be surveyed, decontaminated, and revegetated before release for unrestricted use.

Material, Equipment, and Facility Release:

After preliminary survey and assessment, uncontaminated items and items found contaminated then cleaned-up to the required standards will be buried in authorized landfills on the site or released for unrestricted use. Certain equipment and buildings (e.g., deep disposal well, storage building, etc.) also may be released to the landowner for unrestricted use. Contaminated items not successfully decontaminated, or items judged uneconomic to decontaminate will be transferred to an authorized disposal site or to another licensed operation. Currently they are being sent to Conoco Conquista via Conoco's covered trucks, each shipment being documented by shipping manifest which records the radiation survey of the loaded vehicle.

Facility Preparation:

Preliminary radiological surveys of the buildings, equipment or other facilities will be conducted to determine if contamination is present, followed by an assessment to determine which items will require decontamination and whether they should be disassembled or decontaminated in-place. The assessment will consider the history of the use of the item, the probability of past contamination, the materials and configuration of the item, the accessibility of contaminated parts, the difficulty of dismantling, and the health physics and industrial safety aspects.

Decontamination Processes:

Decontamination will be accomplished first by removal of discrete contaminated parts if possible, releasing the remainder as uncontaminated. The contaminated items and parts will be cleaned by appropriate methods such as wiping, vacuuming, rinsing, washing with detergent, washing with selected solvents, sanding,

planing, or stripping, after taking into consideration age, materials, texture, and configuration. Wastes from the process will be controlled for proper disposal.

Criteria for Release for Unrestricted Use

All materials, equipment and facilities to be released for unrestricted use will be surveyed to demonstrate compliance with Texas Regulations for Control of Radiation (TRCR) 21.109 and Appendix 21-C. These surveys will be taken and documented to meet these criteria as summarized below:

- (1) Removable surface contamination: 1000 dpm alpha per 1000 m².
- (2) Fixed surface contamination (average over 1 m²): 5000 dpm alpha per 100 cm².
- (3) Maximum fixed surface contamination: 15,000 dpm alpha per 100 cm².
- (4) Radiation dose rate measurements of 0.2 mRem/hr (average) and 1.0 mRem/hr (maximum) using a survey meter having a window thickness of ≤ 7 mgm/cm².

All soil will be surveyed to demonstrate compliance with the requirements of TRCR 21.108. These surveys will be completed and documented to meet these criteria:

- (1) 5 pCi/gm of Ra-226 averaged over the first 15 cm depth of soil.
- (2) 15 pCi/gm of Ra-226 averaged over any subsequent 15 cm depth of soil.
- (3) 3×10^{-5} uCi/gm of U-nat.

Final Radiological Sampling and Measurement:

The final radiation survey will be conducted to permit detection of alpha, beta and gamma radiation. A grid method of survey blocks will be established in an identification system for the various buildings and equipment. Certain buildings may be dismantled prior to final survey because of obstacles to removing process equipment and decontaminating surfaces. Where this is necessary, the building components and/or process equipment will be moved to a staging area for final radiological surveys prior to disposal.

Grids will be sized as follows:

- (1) 1 m x 1 m blocks will be used for building surfaces and process equipment which were likely to have been contaminated in the past (e.g., concrete floor pads).
- (2) 3 m x 3 m blocks will be used for walls and ceilings of buildings which were not likely to have been contaminated in the past.
- (3) 10 m x 10 m blocks will be used for general areas outside of the buildings for soil sampling.

The survey protocol will be used in measurements of building and equipment surfaces. A sufficient number of grid blocks will be randomly selected for establishing a statistical basis to determine that the survey results meet the acceptance criteria prior to release. When an item does not lend itself to the grid system, a statistically sufficient number of individual sampling points will be established, measurements taken, and data recorded.

Survey Protocol:

Each grid block designated for radiological analysis will be surveyed and the results documented as follows:

a. Buildings and Equipment:

- (1) There will be five direct measurements of fixed alpha contamination levels at the surface of each grid block, using an Eberline Model RM-19 with an AC-3 probe or equivalent.
- (2) There will be five smear surveys taken from each grid block using standard radiological swipe techniques to analyze for removable alpha surface contamination. These smears will be counted in a bench-top alpha counter Eberline Model SAC-R5 detector with an Eberline MS-2 mini-scaler or equivalent.
- (30) There will be one total external beta/gamma survey of each grid using an Eberline Model E-120 with a Model HP-210 probe or equivalent.

b. Soil:

- (1) There will be five samples taken in each grid block ing to a depth of 15 cm.
- (2) There will be one micro-R measurement taken in each block at a height of one meter with a Ludlum Model 19 instrument or equivalent.

Enclosure 3



TEXAS DEPARTMENT OF HEALTH

MEMO

TO: GENE FORRER
LICENSE FILE L02537

THRU: ROBERT FREE *RF*
ARTHUR TATE *as*
RUTH MCBURNEY *REM*

FROM: OSCAR LESSARD *OL*

SUBJECT: RELEASE FOR UNRESTRICTED USE
WESTINGHOUSE BRUNI FACILITY

DATE: MARCH 16, 1998

The confirmatory close-out survey and analytical results for Westinghouse Bruni facility are attached (dated December 6, 1993, prepared by Thomas Cardwell). The surveys and sampling were accomplished in May and August 1993 by TDH.

Recommend Westinghouse Bruni facility be released for unrestricted use.

**TEXAS DEPARTMENT OF HEALTH
AUSTIN, TEXAS
INTER-OFFICE MEMORANDUM**

DECEMBER 6, 1993

TO: RICHARD RATLIFF *RR*
FROM: THOMAS CARDWELL *Thomas Cardwell*
SUBJ: RELEASE OF WESTINGHOUSE BRUNI URANIUM RECOVERY FACILITY
FOR UNRESTRICTED USE

On May 5 and 6, 1993, Robin Cooksey, Eric Skotak, Karan Raines, and I performed a survey of the wellfields at the Westinghouse Bruni facility near Bruni, Texas. The survey was performed on a ten-meter grid using one-by-one sodium iodide probes. The results of the survey are included as attachments #1, #2, and #3 to this memo. The readings are indicated in thousands of counts per minute (cpm). The meter readings were observed along the entire survey lines with readings recorded each 10 meters. The background readings were approximately 1200 counts per minute. The readings were fairly uniform across the wellfield ranging from 3000 to 5000 cpm.

After completing the wellfield survey, the data was reviewed to determine sampling areas. A total of four areas were sampled as indicated in the attachments. Samples were collected at five locations from 0 - 15 centimeter and from 15 - 30 centimeter depths from each sampling area. At the request of Westinghouse the samples were transported to the Austin Headquarters and submitted to Jordan Laboratories for analyses. The analyses have been completed and forwarded to the Agency for review. Although the samples indicate that the wellfields have slightly elevated concentrations of radium, the average concentrations appear to be below the five picocurie per gram (pCi/gm) and 15 pci/gm limit for release for unrestricted use. The radium concentration in sample area number 1 averaged over 5 pCi/gm radium in the first 15 cm layer of soil. Westinghouse performed further decontamination in the elevated area. Robin Cooksey performed sampling of the area on September 13, 1993. The sample analyses indicates an average concentration of 5.5 pCi/gm of radium-226. Westinghouse has established the natural background of one pCi/gm for the area and has indicated that the area is below 5 pCi/gm above background. The sample results are included in this memo as attachment #4.

On August 3 - 4, 1993, Robin Cooksey, Muhammad Zareabbaszadehk, Victor Whadford, Erick Conard, Rick Munoz, and I surveyed and sampled the plant area at the Westinghouse Bruni facility. The plant area was surveyed on a 10-meter grid basis with readings recorded every 10 meters. The results of the survey are included as attachment #5 to this memo. The readings are indicated in thousands of cpm. The background was approximately 1200 cpm. The readings generally ranged from 1000 cpm to 5000 cpm. One area in the center of the plant pad area was chosen for a sampling location. Five samples from a 0 - 15 cm depth were collected from a 100 square meter area in the plant pad area. We were unable to collect samples from the 15 - 30 cm depth due to the ground being compacted caliche. The samples were submitted to Jordan Laboratories for analyses. The analyses results indicate that the area has elevated uranium concentrations. However, the average concentration of uranium is 30 pCi/gm which is the release limit. The results, included as attachment #6, indicated the average radium concentration was 2.7 pCi/gm.

The buildings and storage areas were surveyed with one-by-one sodium iodide probes and no levels above background were indicated inside the buildings. Wipe samples were also collected from the buildings. The wipe samples were submitted to the Bureau of Laboratories for analyses. Copies of the sample results are included in this memo as attachment #7. The analyses indicated that the buildings meet the release requirements for unrestricted use. The Licensee has agreed with the landowner to leave the warehouse and laboratory building on the property.

Several ponds were previously released for backfilling and a portion of a wellfield was previously released for unrestricted use. The documentation of the surveys and sample analyses results are in the main file transferred to and maintained by the Texas Natural Resource and Conservation Commission.

Westinghouse requested and received an amendment to the License to allow a pilot project for soil washing to remove radium and natural uranium contamination from the soil. The top soil was removed from the wellfields and taken to a central location on the Bruni site for washing. The soil was processed and spread on the wellfields. Although the project may have met with some success, the surveys and soil analyses indicate that the wellfields are somewhat uniformly contaminated above background but within release limits. The process appears to have mixed the contamination to some degree and may not have been successful in actually removing the radium and natural uranium from the soil.

A plot map of the Westinghouse Bruni facility is included as attachment #8.