

9708

JAN 19 1990
DOCKETED
USNRC

'90 JAN 22 P4:37

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of
KERR-MCGEE CHEMICAL CORPORATION
(West Chicago Rare Earths
Facility)

}
}
}

Docket No. 40-2061-ML
ASLBP No. 83-495-01-ML

NRC STAFF RESPONSE IN SUPPORT OF KERR-MCGEE MOTION
FOR SUMMARY DISPOSITION OF THE REMAINING CONTENTIONS

I. INTRODUCTION

On December 22, 1989, Kerr-McGee filed a Motion for Summary Disposition of the Remaining Contentions. This Motion addressed contentions not addressed in Kerr-McGee's Cross-Motion filed on August 22, 1989.

For the reasons discussed below, the NRC staff supports Kerr-McGee's Motion for Summary Disposition of the Remaining Contentions.

II. BACKGROUND

The history of this proceeding has been set out at length in previous NRC staff responses and it will not be repeated here. The State of Illinois filed for summary disposition of most of its contentions that allegedly relate to the NRC staff's Supplement to the Final Environmental Statement (SFES). Both the NRC staff and Kerr-McGee filed responses opposing Illinois' motion. Also, Kerr-McGee filed a Cross-Motion seeking summary disposition or dismissal of all of the Illinois contentions that allegedly relate to the SFES. Kerr-McGee also sought dismissal of some

9001260067 900119
PDR ADOCK 04002061
C PDR

DS07

portions of Contention 2 relating to Kerr-McGee's license amendment application prior to that application's being amended by the West Chicago Project Engineering Report submitted in the spring of 1986. The NRC staff supported Kerr-McGee's Cross-Motion in its response dated September 20, 1989. In an unpublished Memorandum and Order of November 14, 1989, the Licensing Board denied summary disposition of Contentions 4(a) and 3(g)(2). Aspects of those contentions were addressed in a hearing held on December 14 and 15, 1989, in Chicago. On November 22, 1989, the Licensing Board ruled on all contentions on which Kerr-McGee had sought summary disposition other than those reserved for hearing.

III. DISCUSSION

The contentions subject to Kerr-McGee's motion were originally filed by the State of Illinois on the 1979 Stabilization Plan submitted by Kerr-McGee as a part of its license amendment application and the Final Environmental Statement (FES) issued by the Staff in 1983. Since that time, Kerr-McGee has filed a 12 volume Engineering Report that replaced the Stabilization Plan. ^{1/} The Engineering Report contains much of the information that the State maintains is lacking. Further, the Staff has issued a Supplement to the Final Environmental Statement (SFES) in which Kerr-McGee's plan as detailed in the Engineering Report is reviewed. ^{2/}

^{1/} Kerr-McGee Chemical Corp., "West Chicago Project Engineering Report" (April 1986).

^{2/} NUREG-0904, Supp. No. 1, "Supplement to the Final Environmental Statement Related to the Decommissioning of the Rare Earths Facility, West Chicago, Illinois" (1989).

The standards for summary disposition were discussed at length in the NRC Staff's Response to Illinois' Motion for Summary Disposition, dated August 22, 1989. The Staff incorporates that discussion by reference.

A. Contention 2(a)(1)

With respect to levels of inorganic containments [sic] in the onsite wastes, the applicant has conceded (Stabilization Plan 3.43) that because the sludge and tailings piles are nonhomogeneous, averaging the results of the samples does not yield numbers which are necessarily representative of the mass of the wastes. The applicant did, however, use averages in calculating the concentrations of inorganic contaminants released from the disposal cell. In order to provide conservative and reliable estimates of dispersion and dilution effects, the applicant should base its calculation on the hot spots in the wastes.

As support for its motion for summary disposition of Contention 2(a)(1), Kerr-McGee cites the Engineering Report to show that it has conducted extensive random sampling and offers the affidavit of James L. Grant to counter the contention's suggestion that calculations should be based on the hot spots in the wastes. Further, Kerr-McGee supports its motion with Dr. Grant's analysis showing that any impact on groundwater will result from the average properties of the wastes rather than from hot spots. Grant Affidavit at ¶ 5. Kerr-McGee also buttresses its argument in support of the motion with citations to the Engineering Report, testimony at the hearing and Dr. Grant's affidavit to show that Kerr-McGee's modeling did not rely solely on the average properties of the waste.

Kerr-McGee has shown that Contention 2(a)(1) fails to raise a genuine issue of material fact. The Staff believes that Kerr-McGee has shown that summary disposition on its behalf of Contention 2(a)(1) is warranted.

B. Contention 2(a)(ii)

The applicant's dispersion model assumes uniform dispersion of leachate from the disposal cell and does not take into account the possibility of channelized flow. Given the historical experience concerning channelized flow at the Sheffield, Illinois low-level radioactive waste disposal site, and given the inhomogeneous character of the West Chicago Kerr-McGee site subsurface, the possibility and impact of channelized flow must be addressed.

In support of its motion for summary disposition of Contention 2(a)(ii), Kerr-McGee offers the affidavit of Charles W. Fetter, Jr. Dr. Fetter's affidavit delineates and explains the significant differences between the Sheffield site and the West Chicago site and further shows how channelized flow, a problem at Sheffield, does not exist at the West Chicago site.

Kerr-McGee has amply demonstrated that Contention 2(a)(ii) does not raise any issue of material fact; Kerr-McGee has thus shown that summary disposition in its favor should be granted on Contention 2(a)(ii).

C. Contention 2(d)

The applicant's proposed groundwater monitoring system is insufficient to detect the kind and quantity of contaminant migration. Among other things, the stabilization plan does not describe the methods for sample collection, preservation, analysis, and custody; the plan unhelpfully states only that "standard procedures will be followed for sampling and analysis." Plan, 7-3. Similarly, the plan does not describe how groundwater data obtained from the samples will be statistically analyzed; without proper statistical analysis, significant changes in groundwater quality can go undetected. (The plan states only that "Results will be examined for trends by a professional hydrologist." Id.) Nor does the plan specifically indicate the depths, locations, and screen lengths of monitoring wells; without this information the applicant cannot show that screen settings are related to the probable path contaminants would take as they migrated offsite. Nor is the number of wells certain.

Furthermore, the proposed systems does not include analysis for organic waste constituents or indicators of

organic waste constituents. Such analysis must be undertaken because residuals of organic solvents used in the industrial process may be present in leachate.

The applicant has not shown that it will install a background groundwater monitoring system capable of establishing the quality of groundwater which has not already been contaminated by leachate from the site. Groundwater contamination maps in the FES indicate that pollution originating at the Kerr-McGee site spreads offsite in all directions. Samples from improperly located background wells may yield water that has been contaminated by site pollutants rather than water that is representative of the general area.

The applicant does not propose to monitor groundwater for an adequate length of time following closure. Regulations under the Resource Conservation and Recovery Act, 42 U.S.C. §§ 6901 et seq. ("RCRA"), require, in this case, post-closure monitoring for around 60 years. However, given the fact that the proposed disposal site is located above, and has already seriously degraded, the major groundwater source in the area, RCRA's monitoring requirements should be treated as a minimum only.

The contention, as currently worded, reflects Illinois' failure to review Kerr-McGee's Engineering Report. As Kerr-McGee shows in its motion, the Engineering Report provides the information on sample analysis the contention alleges to be lacking and references the procedures to be used. See Engineering Report, Volume XI, Table 11-1. The Staff reviewed Kerr-McGee's plan in the SFES, found the plan to be adequate but recommended some additional sampling. See SFES at 7-2 to 7-4.

As for the length of time Kerr-McGee will be required to monitor the ground water at the site, Kerr-McGee has correctly pointed out that the RCRA regulations do not apply to the site. Motion at 10. Kerr-McGee has proposed a frequency of monitoring for the first ten years which the Staff has found adequate. Monitoring in future years would depend on the results of the monitoring for the first ten years. Kerr-McGee would be

responsible for any monitoring in accordance with the license until the company's license is terminated.

Kerr-McGee has shown that no genuine issue of material fact is raised by contention 2(d) and that it is entitled to summary disposition of Contention 2(d).

C. Contention 2(h)

The decommissioning proposal does not include specific and adequate measures for excluding human beings from the site over the long-term. Given the 14-billion-year half-life of thorium, the NRC's acknowledgement that perpetual care of the site will be necessary, and the site's proximity to residences, commercial establishments, and public schools, discussion of such measures is crucial to evaluating the feasibility of onsite disposal.

This contention appears to be related to contentions 4(e) and 4(g) on which the Board has already ruled. The Licensing Board noted "that some human intrusion onto the site is likely. However, we do not believe that the site would constitute an attractive nuisance, so as to make such intrusion probable." Memorandum and Order, November 22, 1989, at 24-25. Kerr-McGee argues that the issues raised in Contention 2(h) have been decided in LBP-89-35. Motion at 11-12.

Kerr-McGee's argument establishes that no issue of material fact is raised by Contention 2(h) and that it is entitled to summary disposition on that contention.

D. Contention 2(1)

The applicant has not demonstrated that it will adequately control radioactive dust releases from both mobile and stationary sources during stabilization activities, or that the applicant's dust control measures will achieve NRC's ALARA requirement.

Kerr-McGee supports its motion for summary disposition of Contention 2(1) by showing that it has provided its dust control program

of the Engineering Report, Section 9.7. Kerr-McGee will monitor the workers and will maintain air samplers for the site area. Additionally, this is an area that will be subject to NRC inspection to assure compliance with the requirements of 10 C.F.R. Part 20. Kerr-McGee is entitled to summary disposition of Contention 2(1).

E. Contention 2(m)

The applicant has not demonstrated that radiological air hazards will be adequately monitored after closure. Type and model of instrumentation, location of monitoring points, and frequency of reading or sample collection are not discussed. Because of the demographic setting of the proposed site, adequate post-closure radiological air monitoring for an appropriate time period must be carried out.

The NRC regulations in 10 C.F.R. Part 40, Appendix A do not contain any requirements for post closure air monitoring. 10 C.F.R. Part 40, Appendix A, Criterion 6, n. 1 (1989); see, also, 40 C.F.R. § 192.32(b)(1), n. 1 (1989). It is unclear what the State of Illinois wants monitored, as the contention addresses post closure radiological air monitoring without specifying exactly what is to be monitored. Once closure is complete, there should be no particulates present because everything will be in the cell. Although the licensee is not required to do so, Kerr-McGee has committed to monitoring for radon-222. See, Engineering Report, Vol. XII, at 12-2. The Staff believes that summary disposition in favor of Kerr-McGee is warranted.

E. Contention 2(o)

The applicant has not demonstrated that the disposal onsite of 11,000 cubic feet of rare earth compounds will not harm the environment. The applicant must address the toxicity and mobility of these compounds as well as their potential effect on the clay liner.

Dr. Paul A. Benioff of Argonne National Laboratory, Project Manager for the SFES, has addressed Contention 2(o) in an affidavit, which is attached to this response. Dr. Benioff states that the SFES, Table 2.2 shows that the total amount of rare earth compounds under consideration is an insignificant fraction of the total waste volume, specifically, less than 0.1% of the total 376,000 cubic meters of waste. Dr. Benioff states that the recommended literature values of the distribution coefficient (Kd values) for the rare earths is high, 1000 ml/g, indicating that the rare earths are less mobile than other chemical species for which peak concentrations were calculated in the SFES.

Based on data summarized in the NIOSH Registry of Toxic Effects of Chemical Substances, the toxicity of the rare earths is also quite low or nonexistent, especially compared to other parameters listed in Table E.7 of the SFES. See Benioff Affidavit at ¶ 6. There is no reason to expect that rare earth compounds would have a deleterious effect on the clay liner, specifically because these compounds would be present in such low concentrations in the aqueous phase. This is a result of the small amount of rare earths disposed of and the low mobility of those compounds. Therefore, there is no reason to address the toxicity and mobility of the rare earth compounds stored at the site. Id. at ¶ 5. The State of Illinois' contention has no basis and summary disposition in favor of Kerr-McGee is warranted.

F. Contention 2(q)

Based on the calculations in the FES (Table 5.5), the applicant has not shown that during stabilization activities it will meet applicable radiological exposure and emission standards, because unjustifiable assumptions have been made which effectively minimize the calculated dose. Specifically:

(1) The FES assumes that the individual at the nearest residence will spend only 10 percent of his time outdoors. However, since the applicant's earth-moving activities are planned for the warm months, it is unlikely that individuals, especially children, will spend 10 percent of their time outdoors. Underestimating of outdoor time results in underestimation of dose received.

(ii) The FES assumes that radon and thoron will be uniformly released over eight weeks of earth-moving operations. To the contrary, releases will most likely occur as puffs of high concentrations when crusted waste materials are breached. The assumption of uniform release serves to minimize the calculation of dose received.

This contention is based on the FES, which is based on Kerr-McGee's original stabilization plan. The Engineering Report reflects Kerr-McGee's present plans and the SFES reflects the Staff's review of those plans. Dr. YuChien Yuan, an expert at Argonne National Laboratories who prepared the section of the SFES that addresses this matter, has written an affidavit addressing this contention. As Dr. Yuan states in his affidavit, the SFES conservatively assumed that the nearest resident would spend 100% of his time outdoors. See Yuan Affidavit at ¶ 4. Further, the assumptions that radon and thoron will be uniformly released during earth-moving operations will not minimize the calculated doses. For the reasons discussed in Dr. Yuan's affidavit, the use of annual average concentrations to estimate the annual doses received by an individual is appropriate and is believed to be conservative. Yuan Affidavit at ¶ 4.

Illinois' contention is without basis and summary disposition of this contention in favor of Kerr-McGee is warranted.

G. Contention 2(r)

The applicant did not conduct any tests utilizing representative tailings solutions and representative clay

materials to determine whether significant deterioration of permeability or stability properties will occur in the proposed clay liner. Indeed, the applicant has not yet decided what type of clay to use at the site, thus making such tests impossible.

Kerr-McGee has provided some information on the clay liner.

Engineering Report, Vol. 4, Section 4.2.2.1. Contrary to allegations made in the contention, the coefficient of permeability for the clay liner has been specified. Id. at 4-1 through 4-2. It will not matter if some degradation does occur because the liner is not designed to prevent infiltration into the ground water over the long term.

No material fact is at issue with respect to the proposed clay liner and, therefore, Kerr-McGee is entitled to summary disposition of Contention 2(r).

IV. CONCLUSION

As discussed above, Kerr-McGee has established that Illinois' Contentions 2(a)(1), (a)(11), (d), (h), (l), (m), (o), (q) and (r) do not raise a genuine issue of material fact. Kerr-McGee has shown that it is entitled to summary disposition of these contentions as a matter of law.

Respectfully submitted,

Ann P Hodgdon

Ann P. Hodgdon
Counsel for NRC Staff

Dated at Rockville, Maryland
this 19th day of January, 1990

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of

KERR-MCGEE CHEMICAL CORPORATION

(West Chicago Rare Earths
Facility)

}
Docket No. 40-2061-ML

}
ASLBP No. 83-495-01-ML

AFFIDAVIT OF PAUL A. BENIOFF
CONCERNING CONTENTION 2(o)

I, Paul Benioff, being duly sworn, do depose and state:

1. My name is Paul A. Benioff. I am employed by Argonne National Laboratory, Division of Environmental Assessment and Information Systems, as an environmental chemist. I have a Bachelor of Science degree in botany and a Ph.D. in chemistry. A statement of my professional qualifications may be found in the record of the hearing, ff. Tr. 688.

2. In the preparation of the Supplement to the Final Environmental Statement related to the decommissioning of the Rare Earths Facility, West Chicago, Illinois (NUREG-0904 Supplement No. 1, Volumes I and II, hereinafter referred to as the SFES), I authored the sections on: Source Characteristics; EPA Standards; State of Illinois Standards; Water Quality in the Affected Environment; the Chemical Impacts on Surface and Groundwater Quality; and the cost-benefit analysis. I also provided the distribution coefficients for chemical species for hydrogeological modeling.

3. The purpose of this affidavit is to address Contention 2(o).

4. The total amount of rare earth compounds under consideration is about 310 cubic meters. This volume is less than 0.1% of the total 376,000 cubic meters of waste (Table 2.2 of the SFES) and as such is an insignificant fraction of the total waste volume. Moreover, the mobility of the rare earths is quite low. This is supported by the recommended literature values of the distribution coefficient (Kd values) of 1,000 ml/g for the rare earths (Sheppard et al, 1984; Baes and Sharp 1983). This high value shows that rare earths are less mobile than any of the chemical species for which peak concentrations were calculated for the SFES (Table E.7).

5. There is no reason to expect that rare earth compounds would have a deleterious effect on the clay liner, especially because they would be present in such low concentrations in the aqueous phase. This is a result of the small amount of rare earths disposed of and the low mobility.

6. Based on data summarized in the NIOSH Registry of Toxic Effects of Chemical Substances, the toxicity of the rare earths is also quite low or nonexistent, especially compared to other parameters listed in Table E.7 of the SFES.

The foregoing statements are true and correct to the best of my knowledge and belief.

Paul A. Benloff

Subscribed and sworn to before me
this 19th day of January, 1990

Notary Public

My commission expires: _____

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of

KERR-MCGEE CHEMICAL CORPORATION

(West Chicago Rare Earths
Facility)

}
Docket No. 40-2061-ML

}
ASLBP No. 83-495-01-ML

AFFIDAVIT OF YUCHIEN YUAN
CONCERNING CONTENTION 2(q)

I, YuChien Yuan, being duly sworn, do depose and state:

1. My business address is Dames & Moore, 6549 West Quaker Street, Orchard Park, New York, 14127. During the preparation of the Supplement to the Final Environmental Statement related to the decommissioning of the Rare Earths Facility, West Chicago, Illinois (NUREG-0904 Supplement No. 1 Volumes I and II, hereinafter referred to as the SFES), I was employed by Argonne National Laboratory. I led the team in radiological assessment to assist the NRC in the preparation of the Supplement and was also a principal technical reviewer and contributor to the radiological sections of the SFES. I have Bachelor's and Master's degrees in Chemical Engineering and a Ph.D. in Nuclear Engineering. Since 1975 I have worked in environmental assessment and radiological safety related to the nuclear industry. A statement of my professional qualifications was filed with my affidavit filed with the NRC Staff Response of August 22, 1989.

2. The purpose of this affidavit is to address contention 2(q).

3. The radiological analysis in the SFES is intended and believed to be conservative. Dose calculation results (Table 5.11, SFES) for the maximally exposed individual for the Proposed Action are within the limits of the EPA regulation (40 CFR 192.40). Conservative assumptions have been used consistently in the SFES, which tend to maximize, rather than minimize the doses.

4. The dose calculations in the SFES are based on the following conservative assumptions:

- (i) With the exception of calculating doses from radon-222 and its decay products, the SFES assumes that the individual at the nearest residence will spend 100 percent of his time outdoors. For radon-222, because the short-lived decay products rather than radon itself are of primary concern relative to the inhalation pathway, doses to the critical lung tissue, the bronchial epithelium from inhalation of short-lived radon daughters are conservatively calculated on the basis of 100 percent indoor exposure. In a normally ventilated residence, the indoor Rn-222 concentration will be approximately the same as that in the air immediately outside. However, the concentrations of the short-lived decay products (Po-218, Pb-214, and Bi-214) will be higher than they are outdoors due to the additional time allowed for the ingrowth of radon decay products indoors.

- (ii) The assumption that radon and thoron will be uniformly released

during earth-moving operations will not minimize the calculated doses. In the SFES, the airborne radioactivity concentrations have been analyzed using the five year meteorological data collected at O'Hare Airport to determine the annual average air concentrations at offsite locations arising from atmospheric releases. The meteorological data used includes wind direction, wind speed and atmospheric stability. The use of annual average air concentrations is believed to be conservative, because the earth-moving operations will be carried out during the daytime when the atmospheric conditions are mostly unstable, and the annual average concentrations are calculated based on not only the daytime meteorology but also the night time meteorology when the atmospheric conditions are mostly stable.

The use of puffs to calculate concentrations at a receptor location may result in concentrations higher than the annual average concentration when the receptor is in the downwind direction during the release. However, when the receptor is not in the downwind direction, the puffs will not result in any concentration to the receptor.

Because meteorological conditions at a site vary and because the annual concentrations is calculated based on all meteorological conditions experienced, the use of annual average concentration to estimate the annual dose received by an individual is appropriate and is believed to be conservative.

Annex

Note on "Statement of Material Facts"

The NRC Staff states its disagreement with some of the factual statements set out in the Annex to Kerr-McGee's Motion and indicates the basis for its disagreement. The Staff supports the factual statements except where it has indicated a disagreement.

5. The second word in Statement 5 should be "inhomogeneity," as Dr. Grant's affidavit, from which the statement is taken, reads "inhomogeneity."

14-20. Although the Staff does not generally disagree with Statements 14-20, the staff notes that the plan has not yet been submitted to the staff and that the staff's only knowledge of the plan per se is through the copy submitted by Kerr-McGee with its Motion. However, most of the information in the plan is in the Engineering Report and has been approved by the Staff in the SFES. The Staff made certain recommendations, some of which are reflected in the instant response.