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JAN 24 1977

PRIVACY ACT MATERIAL REMOVED

Leon Silverstrom
 Chief Counsel

IGAN, ET AL. V. REECO, ET AL., U.S.D.C., D. NEV., [REDACTED]

These lawsuits had their genesis in the events which occurred at the Nevada Test Site (NTS) on December 18, 1970. On that date at 7:30 a.m., an underground nuclear weapons test, designated by the code name Baneberry, was conducted at the Site in the U8d emplacement hole, Area 8. The test device was buried at a depth of 912 feet. The test proceeded normally until approximately 3-1/2 minutes after the detonation, at which time a release of radioactivity commenced from a fissure which opened up after the detonation, about 300 feet in a southwesterly direction from the emplacement hole.

At approximately 7:45 a.m., the effluent cloud carrying radioactive material emitted from this fissure began to move in a north/northeasterly direction. When it became apparent that this effluent cloud would pass over the NTS Area 12 camp and adjacent areas, and some of the debris would be deposited upon these areas, a decision was made to evacuate all persons from these areas. Evacuation of the Area 12 camp was begun at approximately 8:05 a.m. WSI guards were directed into the camp to insure that all of the people therein were evacuated. Since the southbound route from this area, the Rainier Mesa Road, had been contaminated from the debris from the Baneberry venting, cars and personnel were routed over an alternate evacuation route, the Stockade Wash Road to the Area 17 camp. At this point, cars and personnel were formed into convoys and escorted down the Pahute Mesa Road and Mercury Highway to the decontamination facility located at CP-2. By 2:30 in the afternoon, approximately 900 personnel had been surveyed for contamination. Of these, 86 were decontaminated at CP-2 and 66 were sent to Mercury for thyroid activity measurements. Finally, 18 were transported to the Southwestern Radiological Health Laboratory for a whole body count.

1/ This memorandum represents lawyer's work product prepared solely in connection with trial preparations and evaluation of litigation strategy and should be used only in that vein.



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REPOSITORY DOE-FORRESTAL
 COLLECTION MARKEY FILES
 BOX No. 5 of 6
 FOLDER 2.33 BANE BERRY

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could be classified

The conduct of a nuclear test/as an extra-hazardous, abnormally dangerous activity. Accordingly, it is incumbent upon individuals who conduct such tests to insure that all aspects thereof are performed in a manner to insure that the high duty of care owed to a foreseeable plaintiff, as a result of the conduct of this activity, is not breached. During the discovery phase of this litigation (which extended from February 1972 to July 16, 1976), the plaintiffs challenged the efficacy of the procedures which the defendants used in selecting the Baneberry site, the drilling and stemming activities prior to the event, and the subsequent evacuation. Plaintiffs contend that abnormal geologic and lithologic conditions, which were present at the site of prior, adjacent shots, particularly those conducted in emplacement hole U8a (Discus Thrower) and U2ca (Stutz), should have alerted the defendants to the presence of similar unstable conditions at the U8d location. As a result of the defendants' gross negligence, plaintiffs contend that venting occurred, resulting in plaintiffs' exposure to radiation. (The Board appointed to investigate the Baneberry venting concluded that the venting resulted from the unexpected presence of a high water content in montmorillonite clay.)

The Court presiding over this case has already held, in [REDACTED] v. United States, 370 F.Supp. 525 (D. Nev., 1973), that an extra-hazardous or inherently dangerous activity imposes a non-delegable duty upon the United States to insure that these activities are conducted in a safe manner. On the day of the Baneberry venting, all NTS activities relating thereto were under the control of a Test Manager who was a Government employee. The decision to evacuate the Area 12 camp was his decision. Pre-Baneberry activities, such as the selection of the site for drilling activities, were under the direction of the Lawrence Radiation Laboratory (now known as Lawrence Livermore Laboratory (LLL)); nevertheless, the Government, as an active participant in the proceedings which occurred during this period - such as the meeting of the Test Evaluation Panel - was fully aware of these events and, under the [REDACTED] decision, had a non-delegable duty to insure that all pre-Baneberry activities were conducted in a safe manner so as to insure the containment of this event. If the [REDACTED] decision, as affirmed by the 9th Circuit Court of Appeals, is not challenged, then it is clear that the Government will be held to have had a non-delegable duty to assure that all of the participants in the Baneberry event took proper safety measures and precautions to insure that accidents would not occur and to insure the safety of individuals who might be exposed to radiation. Judge Foley's aforementioned denial of the Government's Motion to Dismiss, although issued without elaboration, presumably was based on [REDACTED]-type reasoning, since much of the Government's Motion was premised on arguments similar to those rejected in [REDACTED].

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The liability of the other defendants (LLL, REECo, WSI) will hinge upon a determination by the Court as to whether these entities breached the duty of care owed to the plaintiffs. This issue will involve a detailed analysis of these defendants' actions in selecting the site and conducting drilling and stemming operations. Thorough exploration of the manner in which post-shot activities were conducted should also be expected (e.g., were plaintiffs provided adequate radiological protective clothing under the circumstances).

SPECIFIC NEGLIGENCE ISSUES

Plaintiffs' negligence arguments are expected to fall into four broad categories:

1. Site Selection
2. Drilling and Related Activities
3. Evacuation Procedures and Radiation Protection Measures
4. Decontamination Measures

Site Selection

Items under this category include the presence of faults, particularly the so-called Baneberry fault near the U8d work point, and the presence of montmorillonite clay at the test location.

During the discovery phase of this location, plaintiffs were given voluminous documents pertaining to all aspects of both the pre- and post-Baneberry activities. Plaintiffs are aware of the procedures which were followed in the selection of an emplacement site and the individuals (i.e., Phil Coyle, Fred Beane, and Richard McArthur) who had the prime responsibility for selecting the Baneberry test location.

Plaintiffs allege that the defendants knew, or should have known, of the existence of the extremely unstable conditions which existed at Baneberry due to the information which had been gathered from two nearby shots (Stutz and Discus Thrower). Plaintiffs indicate that clay was present in both of these holes, particularly the Discus Thrower event. As subsequently shown, the percentage of clay present in the Stutz location (70%) was similar to that which existed at the working point of U8d. Although it meant that we were aware of the presence of clay in U8d, we assert that the evidence of such clay was unknown. In retrospect, and based upon the information which was developed after the Baneberry event concerning the actual amount of clay present both in the pre-Baneberry and in the Baneberry holes, it appears that the selection of this site was in error and that plaintiffs may have a reasonable chance of prevailing on the negligence issue as it pertains to site selection.

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Plaintiffs assert that a fault was present at or near the working point of U8d and that the presence of this fault was another major contributing cause of the Baneberry venting. Again, the presence of a fault was known, but at the time of the Baneberry activities was assumed to be 2100 feet from the working point. The presence of the fault, now named the Baneberry fault, was not determined until after the Baneberry event.

Drilling and Related Activities

Plaintiffs contend that the abnormal amount of water used in the drilling of the U8d emplacement hole indicated the presence of (1) abnormal lithological conditions (e.g., montmorillonite clay), and (2) the presence of a "void" which extended for an indeterminable distance to a fault. As shown by the official records, and as admitted in our answers to interrogatories, approximately 195,000 barrels of water were charged to the U8d location. This is an extremely large amount of water and a serious question exists as to why this did not alert those in charge of drilling that something was amiss. Plaintiffs, in their interrogatories, assert that during the 37 days of drilling U8d, an average of 5,000 barrels per day were used. The extremely high amount of water charged at the U8d location is a matter of record and our explanations for such-use appear to be weak. In retrospect, the tremendous amount of water usage, coupled with other factors, such as the presence of clay, sloughing and - as shown by the caliper logs - "voids," indicate an unstable environment in which to emplace and detonate a nuclear device. This is particularly critical when coupled with knowledge about the Discus Thrower event of May 27, 1966, from which, as we have admitted in answers to interrogatories, a measurable amount of radioactivity was released on the Nevada Test Site.

The caliper logs which were run in U8d indicate a hole enlargement at the 930 foot depth. The extent of this enlargement is not known, but the logs do indicate that its lateral extent is greater than 127 inches. The plaintiffs contend that this so-called "void" extends from the U8d hole to the adjacent fault, and that this provided the initial escape route for the venting gases.

Another factor indicating difficulties in drilling of U8d and of the unstable environment relates to the initial depth (982 feet) as contrasted with the working point depth of 912 feet. We have acknowledged that sloughing problems were encountered during the drilling of this hole, and that the material which had been sloughed fell into the hole filling it with debris between the 982 and 942 foot levels. After it was decided to place the device at 910 feet, stemming material (sand) was placed from 942 feet to 910 feet. From the amount of sand and gravel which was used to stem this hole, it appears that "bridging" did occur, which would be evidence of a noncontinuous stemming operation.

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When all of the foregoing factors concerning drilling-related difficulties and stemming problems are considered, together with knowledge of pre-existing lithologic and geologic conditions, and historical data relating to the Stutz and Discus Thrower events, a judicial determination of negligence would not be surprising.

Evacuation Procedures and Radiation Protection Measures

As shown in the record, the Baneberry guards were not given formal training relating to radiation or radiation protection. The WSI guards, who are the plaintiffs in this action, were ordered or directed to go into the cloud of radioactivity without the benefit of any type of radiation protective clothing. Unquestionably, plaintiffs will rely upon these two factors as primary evidence of negligence on the part of the defendants.

Deficiencies in radiation monitoring activities include the absence of entries in radiation monitor log books on December 18, 1970, the absence of monitors in the Area 12 camp, and the discrepancy in the record readings taken on [REDACTED] or his clothing. Unquestionably, the entries in the handwritten log books and notes kept by the radiation monitors, for December 18, 1970, were deficient. Although the absence of entries was due to the frantic efforts being exerted by those individuals on that date to insure that everyone in the forward area and their vehicles were thoroughly and carefully monitored, the plaintiffs have seized upon this fact as an effort on the part of defendants to minimize the true extent of radiation contamination at the Nevada Test Site on December 18, 1970.

Our explanation for not having monitors in the Area 12 camp is that they were not needed at that location since there was adequate monitoring representation between the camp and the U8d location. Due to the proximity of the Area 12 camp to the U8d location (3.69 miles), the presence of approximately 900 people in this area, and the occurrence of the Baneberry venting, the failure to have monitors in this camp could be construed as negligence.

As already noted, the guards who were ordered into the contaminated area following the venting were not provided with anti-contamination clothing or equipment. In addition, one of these individuals ([REDACTED]) was unaccountably allowed to remain in the forward area for a prolonged period of time, thereby increasing his exposure to radiation from his clothing and vehicle which had been contaminated while he was in the Area 12 camp. These two factors are highly detrimental to the Government's case on the negligence issue.

One of the principal points stressed by the plaintiffs as evidence of negligence relates to the manner in which the Area 12 camp was evacuated. As shown in the record and in our answer to plaintiffs' interrogatories, there is a logical, valid explanation as to why this camp was not evacuated

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at an earlier time and why the fire siren at the fire station in this camp was not activated at an earlier time. The records indicate that evacuation proceedings were initiated as soon as it became apparent that radioactive material from the Baneberry venting would pass over and through the Area 12 camp. The reason for not activating the siren at an earlier time was to prevent the possibility of panic on the part of the inhabitants of this camp, and also to insure that evacuation from this camp proceeded in the alternate route, westerly over the Stockade Wash Road, rather than the normal evacuation route, down the Rainier Mesa Road, which would have passed through the heavily contaminated areas. Although these explanations are logical, they may not be accepted by the Court as adequate, especially in view of the proximity of this camp to the U8d emplacement hole and the venting site.

Decontamination Measures

All of the plaintiffs in this lawsuit were surveyed for contamination at CP-2 and were determined to have, in varying degrees, permissible amounts of radioactivity on either their clothing or their persons. Sixty-six of the individuals evacuated from the forward area on December 18, 1970 were determined to have levels of radioactivity such as to warrant a further decontamination effort and thyroid activity measurements at the Mercury medical facility. Eighteen of these individuals were transported to the Southwestern Radiological Health Laboratory for a whole body count on the afternoon of December 18, 1970. Plaintiffs have stressed the fact that, notwithstanding [REDACTED] high readings of radioactive contamination, he was not among the group transported to Las Vegas for a whole body count. Again, the explanation for this fact is logical - i.e., his whole body count would not have disclosed any further information than previously disclosed by the thyroid activity measurements and other radioactive measurements which had been taken at CP-2 and at the Mercury medical facility. In retrospect, however, it appears that an effort should have been made to transport [REDACTED] to Las Vegas for a whole body count.

DAMAGES

The radiation exposure records for all of the plaintiffs indicate an exposure which is well below the radiation protection guidelines.

[REDACTED]

Admittedly, [REDACTED] was exposed to radiation from the Baneberry event of December 18, 1970. He subsequently contacted leukemia, and died on April 17, 1974. After [REDACTED] became ill, he was sent to the Oak Ridge Medical Facility for examination and treatment. He was also treated at the Loma Linda Medical Facility in Loma Linda, California. An autopsy performed on [REDACTED] confirmed the fact that he had a chromosomal abnormality.

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It appears that [REDACTED] illness, a bone-marrow disease described as acute myelogenous leukemia, started to develop approximately 10 to 13 months after the Baneberry incident. As shown in the literature on this subject, the symptoms for this type of disease usually occur approximately four to seven years after exposure to radiation. Therefore, the possibility of [REDACTED] illness resulting from his exposure to radiation from the Baneberry event is highly improbable.

One of the points in controversy relates to the amount of radiation received by [REDACTED]. Seven readings were taken of [REDACTED] clothing, beginning at 11:00 a.m. and extending through 6:00 p.m. on December 18, 1970. Six of these readings (Beta plus Gamma) range from a high of 200 mrad/hour down to 50 mrad/hour, and exhibit a classic time-decay relationship or pattern. One reading, taken at 4:00 p.m. this date by REECO radiation monitor Mr. Bill Earnest, is recorded as 1 R/hour.

Based on this latter figure, Dr. Shields Warren, a medical doctor/Radiation Pathologist (a participant in the surveys conducted at Nagasaki and Hiroshima, the Bikini and Enewetok tests and in numerous other university and governmental related activities pertaining to radiation), has assumed that the Area 12 camp dose rate was 11 R/hr an hour after detonation, and that [REDACTED] received a dose of 15 R (15 rem?). This reading, and Dr. Warren's extrapolation therefrom, are not supported either by independent, direct maximum dose rate measurements recorded on the radiation probes located at permanent telemetry stations on the roof of the old Area 12 cafeteria or at the E tunnel portal, or from readings taken by other radiation monitors in this area both before and after 4:00 p.m. Although this one reading can be shown to be an abnormality and in error, Dr. Warren relies upon this reading as a basis for his challenge both to the radiological procedures which were in effect at the Nevada Test Site on December 18, 1970, and as a challenge as to the actual amount of radiation received by [REDACTED]. Even if the one reading taken by Mr. Earnest at 4:00 p.m. on December 18, 1970 is rejected, Dr. Warren still asserts that the smaller amounts of radiation received by [REDACTED] could have been the cause of his leukemia.

In this connection, it appears that the chromosomal aberration theory will be one of the principal scientific bases for the plaintiffs' case. We have been advised that Dr. Warren will be one of the plaintiffs' expert witnesses. In his June 9, 1975 deposition, Dr. Warren stated that [REDACTED], subsequent to his exposure, developed a very unusual blood dyscrasia that this abnormality was characterized by the absence of a C group chromosome, as was established both at Loma Linda and at the Oak Ridge National Laboratory." According to Dr. Warren, a radiation exposure of 1 rem or over was enough to produce chromosomal change, and even "a small amount of radiation (such as that received by [REDACTED] on December 18, 1970) could induce leukemia." Four individuals with expertise in disciplines related to radiation and radiation exposure reviewed Dr. Warren's

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deposition and his opinion concerning [REDACTED] (Mr. William J. Brady, Senior Health Physicist, REECO; Dr. R. Evans, an expert in the field of dosimetry; Dr. C. C. Lushbaugh, an expert in the field of radiation injury; and Dr. Neil Wald, an expert in the field of cytogenetics and hematology). It is the consensus of all of these individuals that the disease of acute myelocytic leukemia has never been suspected as being related to radiation exposure; that [REDACTED] radiation exposure was well within tolerable maximum permissible occupational radiation exposure limits; and that his leukemia occurred or developed so soon after the exposure to radiation that this illness could only be coincidental with his radiation exposure.

The history of the survivors of the Japanese atomic detonations and other scientific studies indicates that there has to be a gamma radiation exposure in the order of 100 times greater than that received by [REDACTED] or any of the other IGAN plaintiffs, in order to observe an increase in the incidence of leukemia. To the extent such evidence is accepted in the present case, we could expect to convince the Court that there was no direct causal relationship between [REDACTED] exposure to radiation and his subsequent illness and death.

We have been advised that the issue of causal relationship between exposure to radiation and resulting injury was adversely decided against defendant in the [REDACTED] v. Phillips Petroleum Co. case. It appears that one of the factors considered by the jury was the testimony of a witness that plaintiff had been exposed to 200 rem of radiation rather than the less than 1.5 rem shown on Idaho's radiation records. Since Dr. Shields Warren has already questioned the validity of the REECO radiation exposure records pertaining to [REDACTED], it appears that this will be one of the principal issues raised at the trial of this case.

From the information which has been provided to us, [REDACTED] incurred approximately [REDACTED] of medical bills for treatment he received at the Loma Linda Medical Facility.

[REDACTED], at the time of his death, was 54 years old. He was survived by a widow and one adult son, [REDACTED]. Information in the file indicates that [REDACTED] was 21 years old at the time of the Baneberry event. At the time of his death, [REDACTED] was earning approximately [REDACTED] a year. This amount included base pay, overtime, pay for vacation and holidays and subsistence. According to WSI's personnel records and procedures, an individual of [REDACTED] age and seniority would have been eligible for retirement on March 9, 1985. Based upon the salary he was receiving during the year of his death (1974), the amount he would have received in total compensation from Wackenhut through a period of his anticipated retirement in 1985 would have been [REDACTED].

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Plaintiffs Other Than [REDACTED]

The other 12 plaintiffs are in a different category than [REDACTED] (1) none has suffered a recognizable illness or injury (e.g., leukemia); (2) all of these individuals are alive; (3) there is nothing in our records or in the information available to us which would substantiate, either from a medical or legal standpoint, their claims of injury or damage from the exposure to radiation on December 18, 1970; (4) there is no causal relationship between this exposure and the alleged injuries of these individuals; and (5) plaintiff's "injuries" consist of physical complaints which are normal to a person of comparable age. Therefore, insofar as the other 12 plaintiffs are concerned, they have suffered no damage to exposure from the Baneberry event. A possible exception is Plaintiff Cupples, who has complained of pre-leukemia type symptoms (i.e., tiredness, listlessness and weakness). However, physical examinations, including a study conducted at the Loma Linda Medical Center, fail to disclose the presence of leukemia or any other radiation induced illness or injury.^{3/}

PROGRAMMATIC AND LEGAL ASPECTS OF A SETTLEMENT OR AN ADVERSE DECISION IN THE IGAN CASE

In the event that a decision is made to settle this case, or in the event an adverse decision is rendered following a trial, then it is the opinion of our radiological safety personnel and medical personnel that certain adverse effects might result therefrom. One of their primary concerns involves the established maximum permissible radiation exposure guidelines which up to now have been accepted as a basis for determining the limits to which an individual may be exposed without harm. As shown in the records, the dosage received by all of the IGAN plaintiffs is well within these guidelines or limits. If the apparent thrust of Dr. Warren's position is accepted, then the present radiation standards and guidelines may have to be reevaluated, despite the weight of scientific opinion in their favor.

As indicated above, the primary concept being advanced by the plaintiffs is the C group chromosomal aberration theory. According to scientific experts retained by this office, this theory is at best questionable and appears to be subject to severe challenge on a scientific basis. Nevertheless, this theory was advanced by the plaintiffs' expert witness in the above mentioned radiation case in Boise, Idaho, [REDACTED] v. Phillips Petroleum Co., as a basis for plaintiff's illness and death.

Therefore, if the concept of chromosomal abnormality or deletion resulting from exposure to radiation is established, even on a tentative basis, as a basis for leukemia, or as a factor to be considered in radiation exposure and injuries, then the cost and policy considerations relating to the conduct of physical examinations of individuals who might be exposed to radiation would be considerable. It appears that the testing of present and future employees for chromosomal abnormalities or deletion would cost approximately \$200 a test. Such tests would also raise serious questions

^{3/} Of course if Mr. Cupples does eventually develop more significant pre-leukemia type of symptoms, supported by medical testimony, the laws of probability would present a serious obstacle to our whole position of causation.

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concerning the basis for hiring or firing of a future or present employee. It might also become necessary to consider whether such chromosomal deletions could be a reasonable and valid basis for denial of employment at the Nevada Test Site.

As a result of an analysis of the maximum permissible dosage, coupled with an appreciable decrease in the amount of allowable exposure to radiation, there would be a question as to whether the present dosimetry methods, that is the film badges, would be adequate for recording radiation dosage. It is my understanding that there are more sensitive and sophisticated dosimetry methods, although there are numerous problems associated with their use. Up to the present time, it has not been determined feasible to utilize this system at the Nevada Test Site. However, if the standards for permissible exposure and for imposition of liability are appreciably decreased, then consideration should be given in the adoption of more costly dosimetry methods.

Concern has often been expressed as to whether settlement in this case would establish a precedent. Suit has been instituted by another individual for injuries allegedly received resulting from exposure to radiation on December 18, 1970. In addition, we have recently received two formal administrative claims relating to Baneberry. The view has been expressed that settlement of this case, particularly with the 12 plaintiffs other than [REDACTED], could result in a "flood" of new suits.^{2/}

CONCLUSION

In deciding whether to litigate this case further, we should also consider the question of trial cost and the potential effects of any adverse decision. Cost of defense provided by private counsel, Mr. John Thorndal, for all of the defendants other than the United States for the period through June 30, 1976, is [REDACTED]. In addition, Mr. Thorndal has incurred actual costs in the amount of [REDACTED]. Depending upon the length and complexity of the trial, and the time required in preparation and in arguing in appellate proceedings, additional legal fees of at least [REDACTED] could be expected. There will be other costs, such as payment to expert witnesses and preparation of exhibits. None of the foregoing amounts include the in-house cost to the Government and to the corporate defendants in the preparation of material for use in litigation, such as preparation of answers to interrogatories and compilation of data and documents.

^{2/} With regard to the potential programmatic impact of either settlement or an adverse judicial decision in this case, see also the attached notes prepared by Roger Ray and the NV Bioenvironmental Sciences Division, dated January 13 and January 7, 1977, respectively, which were prepared at Chief Counsel's Office request.

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As indicated above, the weight of the evidence developed to date does not appear to demonstrate any causal relationship between any of the plaintiffs' exposure to radiation on December 18, 1970, and their alleged injuries, although plaintiffs are likely to present several witnesses with impressive credentials to testify to the contrary (e.g., Dr. Warren). This is especially true in the case of the plaintiffs other than [REDACTED]. Nevertheless, in view of certain facts relating to [REDACTED] activities on December 18, 1970, and his subsequent leukemia and death, it would appear that a counteroffer to Mr. Johns to settle with [REDACTED] in the range of [REDACTED] - [REDACTED] would be appropriate. We have been informally advised that [REDACTED] is in ill health and is in need of financial assistance; therefore, it would seem that an offer of settlement at an amount appreciably less than asserted by her counsel, Mr. Larry Johns, might be accepted by [REDACTED].

It is still my opinion that none of the other 12 plaintiffs have any medical symptoms resulting from the exposure to radiation on December 18, 1970. Admittedly, there is always the risk that upon trial the Court might adopt the classic assault and battery concepts asserted by plaintiffs and render a judgment in their favor. However, in view of the medical and policy considerations, as outlined above, and in view of the overwhelming scientific evidence which controverts their claim, it is my opinion that no settlement offer should be made to these plaintiffs.


 Buford L. Allen
 Attorney

CC:BLA

Enclosures:

1. Memo, R. Ray to L. Silverstrom, dated 1/13/77
2. Memo, BSD to R. Ray, dated 1/7/77