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OFFICE MEMORANDUM

LOS ALAMOS SCIENTIFIC LABORATORY
Los Alamos, New Mexico 87545

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DATE: August 2, 1979

1 R. D. Baker, ADW

IECT THE LASL POSITION ON FUTURE AVAILABILITY OF BERYLLIUM AND BERYLLIUM OXIDE (U)

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The past nine months or so have presented a somewhat perturbing problem for us with respect to the use of beryllium and beryllium oxide in our weapon designs. The variety of opinions and views expressed may have enough of us confused to warrant an explanation of what I believe to be our current position.

The Occupational Safety and Health Administration (OSHA) of the United States Department of Labor (DOL) published, on October 17, 1975, in 40 Federal Register 48814, a "Proposed Occupational Safety and Health Standard for Exposure to Beryllium", which drastically reduced the amount of beryllium products permitted in the air in the workplaces throughout the beryllium industry. This proposed standard was amended twice and was then submitted to the public for comments.

Neither the Department of Energy (DOE) nor the Department of Defense (DOD) was represented at the public hearings on the proposed standard, which were held in Washington in August and September of 1977. The primary beryllium industry was represented, and the difficulties of meeting the proposed standard were pointed out somewhat ineffectively. Briefly, the industry claimed they would be unable to continue production of beryllium (Be) metal and, perhaps, beryllium oxide (BeO). This point was later brought out more emphatically in the press and other media.

In January 1978, the Albuquerque Operations Office (ALO) of the Office of Military Application (MA) of DOE formed a Beryllium Task Group to define the impact of the proposed standard on the Be industry, and to evaluate options available to DOE to minimize the effects of the proposed

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standard on DOE programs, primarily those involving weapons. Lawrence Livermore Laboratory (LLL), Rockwell International, Atomics International Division at Rocky Flats (AIRF), Union Carbide's Y-12 Plant (Y-12), and LASL were represented on the Task Group that was chaired by a member of the ALO staff. The Task Group, after visiting the plants of the primary Be industry and meeting with their managements, submitted a comprehensive report to MA in May 1978. The Group continued meeting and continued its investigations up to the present. This report painted a gloomy, expensive picture.

The LASL representative on the DOE/ALO Beryllium Task Group, John E. Hockett, has made some observations that we believe may be quite helpful in keeping the Be availability situation in realistic perspective. He points out that we, of the DOE weapons complex, may be over-reacting to the proposed Occupational Safety and Health Administration (OSHA) standard, or the beryllium industry reaction to it. A careful reading of the proposed standard and, in particular, section f, "Methods of Compliance", reveals that a program of compliance must be prepared, submitted to OSHA, instituted, and revised and reviewed at 6-month intervals. However, where engineering controls and administrative controls cannot meet the standard, work practices, such as personnel rotation and use of respirators, may be used. Thus the threat to availability may not be as serious as it was first thought to be. This is particularly true in the light of the action of the Fifth Circuit Court of Appeals that threw out OSHA's Benzene Standard. This will be reviewed by the U. S. Supreme Court, but regardless of the outcome, this Appeals Court action surely will affect standards in the beryllium, asbestos, lead, and other industries.

Also, the LASL representative notes that the primary beryllium industry, viz., Kawecki-Berylco Industries (KBI) and Brush-Wellman, Inc. (BWI), is presently operating some dirty plants. These plants could be cleaned up and both engineering and administrative controls might be instituted at government expense in a serious concerted effort to meet the proposed (OSHA)

standard. Both KBI and BWI repeatedly informed the DOE/ALO Beryllium Task Group that they cannot meet the proposed new OSHA standard, regardless of how much time, effort, and money they spend; this appears to be questionable. However, even if the industry believed they could meet or closely approach the standard, the small volume of Be metal business does not warrant their investing the necessary amounts of money in new equipment to attempt to meet it. Hence, any such activities would probably require government funding. We now understand that KBI is going to get out of the Be metal business, leaving BWI as the sole source (and in the driver's seat as they pointed out to OMA).

Further he suggests that the government should support research and development programs to find new, nonhazardous, or less-hazardous, processing techniques to produce Be and BeO from the beryllium hydroxide ($Be(OH)_2$) currently produced from the ores by BWI at their Delta, Utah mill. Instituting such techniques in the industry as soon as possible clearly would be a major step toward meeting the proposed standard in the primary beryllium industry, or toward improving the workplace environment even if the standard is not promulgated.

In view of the foregoing, it was deemed worthwhile to state the LASL position on the future availability and uses of Be and BeO. That position follows:

It does not appear that preserving the availability of either beryllium metal (Be) or beryllium oxide (BeO) is mandatory to the Department of Energy (DOE) for the long term, although such preservation may be desirable if it can be achieved by reasonable expenditures of both effort and money. Preserving this availability may well be mandatory, for the short term, to complete production of such current weapons and systems as do utilize these materials, where redesign and testing are impractical.

LASL presently has six weapon types in stockpile (W25, B28, W31, B33, B53, W53) and two entering production (B61-3, B61-4) that contain neither Be nor BeO. We had offered to provide a redesigned W80 without these

materials, pointing out that a complete modification of the production schedule would be required if this option were to to be exercised. We believe that a variation on the W76 could also be provided without these materials. Changes of this nature would require full-scale testing and additional development and production funding. We have informed DOE of such other penalties as might possibly be incurred by eliminating Be and BeO, e.g., possible lower yields, possible greater use of Special Nuclear Materials (SNM), possible greater weight, and probable additional nuclear tests.

Because the Be and BeO availability is uncertain and may remain so for months or even years of hearings and of litigation, we believe that it is extremely important that the nuclear design laboratories design future weapons to use either a minimum of, or no Be and BeO. The DOE/ALO Beryllium Task Group was informed that this is the position of the British Ministry of Defense (MOD). Also, the U. S. Air Force-sponsored Joint Aeronautical Materials Activity Committee (JAMAC) has officially notified Space and Missile Systems Organization (SAMSO) of the Air Force that: "... If beryllium substitutes are available or contemplated, it is strongly urged that their implementation be sought as soon as possible. Unless absolutely necessary, beryllium usage should be avoided in all new systems."

Consistent with the above outlined position, we are working with the Integrated Contractors and within our own materials development organization to perfect and test substitute and alternate materials for the Be and BeO applications in all of our contemplated weapons systems.

We also believe that such beryllium as is determined to be "absolutely necessary" for optimal weapon performance should be ingot-sheet beryllium wherever feasible. The ingot-sheet facility at Rocky Flats could be reconstituted and expanded as necessary, and the design laboratories should attempt to use this material in preference to powder-metallurgy beryllium. There is a substantial quantity of beryllium scrap presently on hand in the DOE complex which could be recycled through Rocky Flats.

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We contend that drastically reducing the Be and BeO requirements of DOE; funding, at least partially, a serious cleanup of the Be industry, including R & D into new processing techniques; and utilizing the Rocky Flats Ingot Sheet Facility to the utmost would greatly reduce, or even eliminate the anticipated shortage of these materials and the probable attendant curtailment of weapons production. Current proposals to purchase and stockpile Be and BeO would increase the amount of these materials in the air at the various plants of the industry; the proposed purchases would also drive the prices of both products higher and higher. We understand that the current quotes for commercially fabricated beryllium blanks are already significantly greater than they were two years ago. The above proposals would eliminate both of these disadvantages and would enable the current primary Be industry to produce the reduced DOE requirements in compliance with the proposed OSHA standards.

Further, we believe that the foregoing measures could eliminate the need for a Government-owned, Company-operated (GOCO) plant, at an estimated cost of at least $150M. These actions would also keep the government out of the beryllium products supply business, certainly a worthwhile endeavor, and would result in rather minor disruption to the "design-test-production" cycle of the DOE weapons complex.

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