



SHIELDALLOY METALLURGICAL CORPORATION

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March 6, 2001

Mr. Theodore S. Sherr, Chief
Licensing and International Safeguards Branch
Division of Fuel Cycle Safety and Safeguards, NMSS
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

**Re: Decommissioning Funding Plan for Source Material License No. SMB-743
(TAC No. L31338)**

Dear Mr. Sherr:

On October 19, 1999, in accordance with Provision No. 15 of Source Material License No. SMB-743, Shieldalloy Metallurgical Corporation (SMC) forwarded to you Report No. 94005/G-9194, "Decommissioning Funding Plan for the Newfield, New Jersey Facility (Revision 0)". In a letter dated February 11, 2000, you informed SMC that our Plan was denied. On April 20, 2000, SMC provided responses to the denial, along with Revision 1 of the referenced Plan. In a letter dated December 7, 2000, the USNRC requested additional information be provided before final action is taken on our Plan.

The purpose of this letter is to provide you with that information. Attached is a listing of the additional information items requested, our response to each request, and the action that SMC intends to take. Once USNRC concurrence on these responses is received, SMC will incorporate the necessary changes into Revision 1 of the Plan, and forward it to you, along with all applicable documentation. In the meantime, please call me at 856-692-4200, extension 226 if I can answer any questions, or provide you with additional information to facilitate your review.

Sincerely,

David R. Smith
Radiation Safety Officer

cc (w/enc.): Nigel C. Morrison, SMC
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RESPONSE TO REQUEST FOR INFORMATION
Shieldalloy Metallurgical Corporation - License No. SMB-743

(1) Provide Certification of Financial Assurance and Signed Original Financial Instruments (10 CFR 40.36(d)): Shieldalloy stated it intends to provide financial assurance instruments after the DFP is approved. However, 10 CFR 40.36(d) requires that the DFP contain a certification by the Licensee that financial assurance for decommissioning has been provided in the amount of the cost estimate for decommissioning and a signed original of the financial instrument obtained to satisfy the requirements 10 CFR 40.36(e). *The Licensee should submit the required certification and signed original financial instruments with its revised DFP.*

SMC Response: Concur.

Action Taken: The required certification and the signed original financial instrument will be included with Revision 1 of the DFP.

(2) Clarify the Release Criteria that will be used for License Termination (10 CFR Part 20): Page 9 of the DFP states, "The criteria for allowing release of sites for unrestricted use are shown in 10 CFR 20.1402". However, on page 10, the DFP states, "...an analysis must be conducted to verify that exposure to members of the public is limited to less than 100 mrem per year in the event that land use controls fail". The 100 mrem per year criterion applies to license termination under restricted conditions as defined in 10 CFR 20.1403. The DFP does not specifically state which set of criteria will be applied to the site. *The cost of decommissioning is significantly affected by the choice of criteria. The licensee should state which set of criteria it intends to use to decommission the site.*

SMC Response: The statements the USNRC references in Section 3.3 of the DFP that refer to the criteria for release of sites for restricted and unrestricted use, were intended to provide a description of the options available. In the last sentence of Section 3.3, SMC states "Because the goal of decommissioning the Newfield site is to ensure that members of the general population do not incur radiation doses in excess of 25 millirem per year after the license is terminated, this objective forms the basis for the level of effort necessary for decommissioning and for this decommissioning funding plan". Thus it is clear that SMC intends to release the site for unrestricted use once all decommissioning actions are complete.

Action Taken: None required.

(3) Verify that the DFP Cost Estimate Provides for Removal of Residual Radioactivity Adequate to Decommission the Facility to Meet Applicable Dose Limits and ALARA Goals (10 CFR Part 20): Page 10 of the DFP states, "The maximally-exposed individual, after licensed operations have ceased, would not receive an annual radiation dose above 25 millirem total effective dose equivalent (TEDE)". In contrast, both 10 CFR 20.1402 (unrestricted use criteria) and 10 CFR 20.1403 (restricted conditions) require that the annual dose limits be applied to the "average member of the critical group". The applicable regulations further require that residual radioactivity be reduced to levels that are as low as reasonably achievable (ALARA), as well as other public and environmental considerations. The information submitted with the DFP is not sufficient to determine whether the stated exposure goals are equivalent to the regulatory requirements. The definition of dose used in the DFP is important because it can significantly affect the cost of decommissioning. *The Licensee should verify that the*

DFP cost estimate provides for removal of residual radioactivity adequate to decommission its facility to meet the dose limits and ALARA goals defined in 10 CFR 20.1402 or 20.1403, as applicable.

SMC Response: As stated in Section 3.3, SMC is committed to removing residual radioactivity such that the site may be released for unrestricted use pursuant to 10 CFR 20.1402, and applicable ALARA provisions.

Action Taken: For clarity, the last sentence in Section 3.3 of the DFP will be modified to read as follows: "Because the goal of decommissioning the Newfield site is to ensure that members of the general population do not incur radiation doses in excess of 25 millirem per year after the license is terminated, these two objectives (i.e., the dose limit contained in 10 CFR 20.1402 and the ALARA provisions) form the basis for the level of effort necessary for decommissioning and for this decommissioning funding plan."

(4) Submit Additional Detail to Support the Cost Estimate (Draft Regulatory Guide DG-3014, pages 24 through 33, and NUREG/CR-6744, Appendices A and E): The cost estimate does not include sufficient detail to allow an adequate evaluation of decontamination and/or dismantling costs and long-term surveillance costs. In particular, the submission does not include the following information:

- Characterization of excavated soils from previous remedial activities currently stored on site (pages 3 and 11 of the DFP refer to previously excavated soils stored in the Storage Yard);
- Detailed description of the method for estimating the volume of slag used as fill material on site (mentioned on pages 7 and 8 of the DFP);
- Detailed breakout of the cost of the engineered waste disposal cap, including costs of labor, equipment/supplies, the shielding layer, the geotextile liner, the drainage layer, the frost protection layer, the vegetative layer, and the proposed drainage controls;
- Detailed breakout of the labor and equipment/supply costs for each activity related to site stabilization and long-term surveillance (listed on page 8 of Appendix C to the DFP);
- Detailed breakout of the labor and equipment/supply costs for scabbling floor spaces requiring decontamination; and
- Types of radiological survey equipment required.

In order to support an evaluation of the estimated decommissioning costs, the Licensee should revise its cost estimate to include the information listed above and to increase the level of detail, especially for decontamination and/or dismantling costs and long-term surveillance costs. The revised cost estimate should be consistent with the cost estimating tables on pages 24 through 33 of Draft Regulatory Guide DG 3014 (see tables 3.10, 3.15, 3.16, and 3.17). The Licensee should use the tables found in Appendices A and E of NUREG/CR-6477, "Revised Analyses of Decommissioning Reference Non-Fuel Cycle Facilities", July 1998, as a guide to the costs normally encountered in decommissioning projects.

SMC Response: Concur.

Action Taken: SMC will update the cost estimate to be consistent with the requirements in USNRC Draft Regulatory Guide DG 3014 (Tables 3.10, 3.15, 3.16, and 3.17). In addition, more detail will be provided for the level of effort for the previous remedial work, the assumptions to estimate the volume of slag, the assumptions to install the engineered cap, stabilization tasks as well as long term surveillance. SMC will describe the level of effort and costs associated with scabbling floors during the decontamination phase. SMC will expand on the description of the radiation survey equipment that will be used during the final status survey.

(5) Revise the Engineered Cap Cost Estimate to Include Surface Area Driven Costs: In response to a February 11, 2000 letter from NRC to the Licensee, the Licensee describes the use of a ratio/scaling factor for the cost of capping the residual radioactivity in the Storage Yard after site-wide decommissioning. The response describes this factor as the volumetric ratio of the Newfield-to-Cambridge disposal areas. However, the estimated costs for the engineered cap based on this volumetric method do not account for the volume of process equipment and construction debris that cannot be decontaminated for unrestricted use, which, according to page 11 of the DFP, will also be placed under the cap.

In addition, some costs associated with the engineered cap should be calculated as a function of the surface area of the cap rather than the volume of material under the cap. For example, page 11 of the DFP states that the pile will be covered with a shielding layer, a geotextile liner, a drainage layer, a frost protection layer, and a final vegetative layer. The costs associated with these layers will be driven by the surface area to be capped, not the volume of disposed waste. *The Licensee should adjust the engineered cap cost estimate to consider surface area driven costs. The estimate should include costs for disposing the volume of all equipment/wastes which will be placed under the cap.*

SMC Response: A fundamental assumption in the preparation of this DFP is that the approach and costs for in-situ disposal of residual radioactive materials at Newfield would be similar to that already approved by the USNRC for SMC's Cambridge, Ohio facility. Therefore, SMC assumed the volume of material to be placed under the engineered cap, *to include all process equipment and construction debris*, would be 42% of the volume contained under the West Slag Pile cap at SMC's facility in Cambridge, Ohio. Inherent in that assumption is that each dimension of the impoundment (i.e., length, width and height) would be 42% of the West Slag Pile dimensions. Similarly, the cap volumes/dimensions would also be 42% of the volumes/dimensions of the West Slag Pile cap.

Action Taken: None required.

(6) Clarify Inconsistencies in Information Used to Support the Cost Estimate: The dimensions of facility areas provided in the cost estimating tables on pages 19 through 22 of the DFP are inconsistent with the text descriptions of these same areas on pages 4 through 6 of the DFP. In particular, the following inconsistencies have been noted:

- Page 4 of the DFP lists a total surface area of 8,710 m² for Building D111, whereas page 19 provides a total surface area for floors, walls, and ceilings in D111 of 6,689 m². Page 19 contains small errors that should be corrected: Line 9, column 3 states the surface area of the floors is 930 m², while column 4 of that line states the area as 929

m². Line 11, column 3 incorrectly states the total wall area as 2973 m², rather than 2974 m².

- Page 5 of the DFP lists a total surface area of 375 m² for the Flex-Kleen Baghouse, whereas page 19 provides a volume of 5,574 m³ for the Flex-Kleen Baghouse and associated ducting. Furthermore, page 6 of Appendix C implies that this volume of 5,574 m³ is filter bags and residual dust.
- Page 5 of the DFP lists a total surface area of 7,950 m² for Building D102, whereas page 22 provides a total surface area for walls and ceilings in D102/d111 of 4,645 m² and a volume of 18 m³ or 19 m³ for the floor. The discrepancy between the floor volume values listed in columns 3 and 4 on page 22 should also be corrected.
- Section 2.4 of the DFP discusses the Storage Yard. The section lists 20,000 m³ of slag and 20,000 m³ of baghouse dust as stored in the Storage Yard, whereas page 20 lists 43,000 m³ slag and 10,000 m³ of baghouse dust. Furthermore, footnotes 14 and 16 on page 6 indicate that a 1991 fly-overestimated 17,840 m³ of slag and 15,100 m³ of baghouse dust in the Storage Yard.
- Section 2.4 of the DFP does not mention excavated soils stored in the Storage Yard, whereas page 20 lists 6,500 m³ of excavated soils. Page 11 of the DFP states that the excavated soils will be placed under the engineered cap.
- Table 3.11 of Attachment B incorrectly transcribes the number of workers estimated for restoration of contaminated areas on facility grounds from Table 3.8.

The font size used in the tables included in Attachment B of the submittal results in very small superscripts for the abbreviations of area and volume, such that the exponents (2 and 3) are difficult to distinguish. The Licensee should revise the tables to clearly distinguish units of area and volume.

Inaccurate estimates of surface areas and volumes in the cost estimating tables may result in an understatement of decontamination and dismantling costs as well as waste disposal costs. therefore, in order to allow an adequate evaluation of the estimated decommissioning costs, the Licensee should clarify the inconsistencies noted above.

SMC Response: Concur.

Action Taken: SMC will review the dimensions for each of the buildings/areas subject to decommissioning to ensure round-off error does not result in slightly different values in the various listings within the DFP. Modifications will be made accordingly to the DFP. In addition, the dimensions of both the slag piles and the baghouse dust piles currently in the Storage Yard, along with the formerly-excavated soils, will be confirmed and documented. Finally, Table 3.11 will be corrected, and larger font sizes will be used for Attachment B in Revision 1 of the DFP.

(7) Substantiate Assumptions Regarding the Extent of Contamination at the Facility: The Licensee has not adequately supported its assumptions regarding the surfaces that require decontamination at the facility. The cost estimate assumes a relatively small proportion of the surface areas will require decontamination. The assumptions may lead to an understatement of the cost of

decontamination. Cost calculations on pages 4 through 6 of Appendix C to the DFP are based on the following assumptions:

- On page 4 of Appendix C to the DFP, the Licensee states that "For the purposes of cost estimating, it was assumed ~450 m² of D111 floor space requires decontamination, ~370 m² of Flex Kleen Baghouse pad, [and] 110 m² of the AAF pad require decon." However, the Licensee has not explained why these surface area assumptions are reasonable. In addition, the DFP does not identify the quantity of contaminated floor space associated with building D102/D112.
- On page 5 of Appendix C to the DFP, the Licensee states that "It is assumed based on quarterly surveillance surveys that the [wall] panels are not contaminated greater than the release criteria, but steel beams are contaminated (covered with accumulated dust from plant operations)". A similar statement is made with regard to the ceiling panels. However, the Licensee does not explain why steel support beams would be covered with accumulated dust from plant operations (and thus contaminated sufficiently to require decontamination), but walls and ceiling panels held up by the beams would not be contaminated to the extent that decontamination is needed.
- On page 6 of Appendix C to the DFP, in regard to the ventilation and ductwork associated with Building D111 and the Flex Kleen Baghouse, the Licensee states that "Based on the radiological condition of the AAF Baghouse when it was disassembled, it can be assumed that the majority of the metal will not be contaminated at levels greater than the release criteria". However, the Licensee does not explain what the radiological condition of the AAF Baghouse was before disassembly. Nor does the Licensee discuss changes to the manufacturing process or operating conditions of the baghouse, if any, after the Flex Kleen air handling system was installed. the Licensee should discuss the radiological process, and operating parameters before and after the installation of the Flex Kleen system in order to establish the likely radiological condition of the Flex Kleen Baghouse.

Underestimation of areas that require decontamination may result in a significant understatement of the decontamination costs. The Licensee should revise its cost estimate to account for all surface areas that may require decontamination and provide additional support for the assumptions given in Appendix C to the DFP.

SMC Response: SMC has performed extensive radiation surveys in the buildings subject to decommissioning. The USNRC, in previous inspections, has confirmed many of the surveillance findings. The results demonstrate that many of the building surfaces are free of contamination above nominal release criteria.

In regard to the comment about Page 4, Appendix C, the actual dimensions of D111 are provided in the DFP rather than the dimensions of the area to be decontaminated.

In regard to the comment about Page 5, Appendix C, the support beams allow dust to collect on the flat horizontal surfaces. Consequently, a build-up of removable radioactivity exists in these locations. No such problem is likely on the walls or ceiling panels since they are vertical, rather than horizontal structures. This assumption is confirmed by radiological survey data acquired during quarterly surveillance activities.

In regard to the comment about Page 6, Appendix C, the two ventilation systems formerly in use at D111 (i.e., the FlexKleen and the AAF systems) operated in tandem. As such, materials moving through each were similar in nature. Also, since the demolition of the AAF baghouse, there have been only occasional uses made of the D111 furnace, and none of these involved the smelting of source material. Consequently, it is reasonable to assume that the radiological conditions within each are also similar. The radiological conditions of the AAF baghouse, both before and after its decommissioning, were reported to the USNRC previously. The description of the FlexKleen baghouse provided in Section 2.1 of the DFP uses this report as one of its bases.

Action Taken: Additional support for the assumptions made in Appendix C will be provided. In addition, Section 2.1 will be modified to more thoroughly describe the operation of the D111 air handling system over the years.

(8) Revise the Cost Estimate to Include Contractor Profit (Draft Regulatory Guide DG-3014, page 21, and NUREG/CR-6477, Appendix A): The Licensee's cost estimate assumes that the decommissioning work will be performed by a contractor. Although the estimate includes contractor overhead, the estimate does not appear to account for 15 percent profit on labor and overhead, as recommended for estimating the costs of contractor staff on page 21 of Draft Regulatory Guide DG-3014 and in Appendix A of NUREG/CR-6477: [Comparison shown]. Unless contractor profit is fully included, the cost estimate may not be adequate to cover all decommissioning costs. For example, adding 15 percent profit to the labor rates reported in the cost estimate would increase the Licensee's estimated decommissioning costs by over \$100,000. the Licensee should revise its estimated labor rates as necessary to reflect all contractor profit, or provide justification for the rates used.

SMC Response: The labor rates used to develop the cost estimates shown in the DFP are fully burdened rates, which includes the overhead costs.

Action Taken: None required.

(9) Revise or Justify Estimates for Waste Disposal (NUREG/CR-6477): The cost estimate submitted by the Licensee did not include several cost items that normally are included in waste disposal costs:

- Pages 5 and 6 of Appendix C to the DFP discuss HEPA vacuuming and pressure washing of walls, ceilings, and equipment, but the cost estimate does not include costs for treatment and disposal of wastewater generated by these decontamination activities and disposal of personal protective equipment used by workers.
- Tables 3.14(a) through (c) of the DFP assume zero cost for packaging, shipping, and off-site disposal of waste radioactive material.
- Table 3.15 in the DFP cost estimate does not include any non-labor costs (e.g., packaging materials, containers, etc.) for on-site disposal of facility building components, equipment, certain decontamination wastes, slag, baghouse dust, and contaminated soil.

Based on these observations, the Licensee's cost estimate may understate the costs of waste disposal. The Licensee should:

- Include costs for treatment and disposal of wastewater generated by decontamination activities and disposal of personal protective equipment used by workers.
- Justify the assumption that no offsite radioactive waste disposal will be necessary.
- Include any non-labor costs for on-site waste disposal.

Tables provided in NUREG-CR/6477 may prove helpful for estimating the quantity of waste generated in decontaminating individual facility components.

SMC Response: SMC assumes that offsite disposal of waste will not be required. Personal protective equipment and equipment used during decontamination efforts will be disposed of under the engineered cap. Minimal volumes of water will be generated during the decontamination efforts. However, all water collected for this purposes will be used for dust control during material placement in the storage yard.

Action Taken: SMC will modify the DFP to include additional support for the "no off-site disposal" assumption, and will confirm that any non-labor costs for on-site disposal are included in Revision 1 of the DFP.

(10) Revise the Estimate of Site Stabilization and Long-Term Surveillance Costs: The decommissioning cost estimate submitted by the Licensee includes an estimate of \$358,050 for site stabilization and long-term surveillance of the engineered disposal cap. This estimate should be revised to address the following observations:

- Draft Regulatory Guide DG-4006, "Demonstrating Compliance with the Radiological Criteria for License Termination" (August 1998), page 33, states that it is acceptable to assume up to a 2 percent real rate of return on funds set aside for site control and maintenance. However, the cost estimate submitted by the Licensee applies a discount rate of 7 percent to all site stabilization and long-term surveillance costs. (As implemented in the Licensee's cost estimate, this 7 percent rate is effectively a real rate, rather than a nominal one.)
- The Licensee applies the discount rate incorrectly to the total estimated costs for site stabilization and long-term surveillance. Specifically, to calculate the figure used for site stabilization and long-term surveillance costs in the cost estimate, the Licensee multiplies the sum of all site stabilization and long-term surveillance costs over a 1,000-year period by the discount rate of 7 percent (i.e., $\$5,115,000 \times 0.07 = \$358,050$). This calculation, which is not consistent with generally applied discounting methods, results in an estimate that is probably higher than would result if an assumed 2 percent real rate of return had been applied correctly. To arrive at an appropriate amount, the estimate should determine annual site stabilization and long-term surveillance cost and divide that figure by 2 percent. For example, if we assume the cost of site stabilization and long-term surveillance cost is \$5,115 ($\$5,115,000 \div 1000 \text{ yr.}$) annually, then this figure should be divided by 2 percent to yield a present value estimate of \$255,750 (i.e., $\$5,115 \div 0.02 = \$255,750$). (If this amount of money were invested to provide a real

rate of return of 2 percent, the annual earnings of the fund would be just enough to pay the annual cost of \$5,115 (i.e., $\$255,750 \times 0.02$.)

- The annual cost assumed for long term surveillance may be understated in the DFP. The Licensee relied on costs documented in NUREG-1543 ("Draft Environmental Impact Statement Decommissioning of the Shieldalloy Metallurgical Corporation Cambridge, Ohio Facility"), which was issued in July 1996. However, those costs may no longer be appropriate due to new regulations (Federal Register, July 21, 1997, pages 39058 through 39092, Radiological Criteria for License Termination, Final Rule) issued on July 21, 1997 that define the radiological criteria for license termination. Estimates of decommissioning costs made after issuance of the new rules indicate higher amounts are needed for long term surveillance of sites released under restricted conditions. For example, in NUREG/CR-6477 (page E.7 and Table E.6, page E.9), the cost of long term surveillance for a tailings pile/evaporation pond (100 m long by 50 m wide) capped with asphalt and covered with grass is about \$17,000 annually. NUREG/CR-6477 was issued in July 1998 to update decommissioning costs for non-fuel cycle facilities, such as the one operated by the Licensee. The amount estimated by NUREG/CR-6477 would require a fund of \$850,000 to provide financial assurance for an annual cost of \$17,000, using a 2 percent annual rate of return.

To ensure that the cost estimate is adequate, the Licensee should revise the estimate of site stabilization and long-term surveillance costs. Specifically, the Licensee should determine and specify the annual site stabilization and long-term surveillance cost, and then should divide that figure by 2 percent to determine the appropriate funding amount.

SMC Response: Concur.

Action Taken: SMC will revise the estimate of site stabilization and long-term surveillance costs consistent with the criteria established in NUREG/CR-6477. In addition, a two (2) percent discount rate will be applied. These changes will be captured in Revision 1 of the DFP.

(11) Revise or Justify Estimates for Radiological Survey Equipment (NUREG/CR-6477): The Equipment/Supply Costs schedule included in the cost estimate lists a \$500 unit cost for radiological survey equipment. Appendix A of NUREG CR-6477, however, recommends a unit cost ranging from \$240 to \$10,800, depending on the type of detector used. *To ensure that the cost estimate accurately reflects radiological survey equipment costs, the Licensee should modify its radiological survey equipment unit cost or justify the cost provided in the cost estimate.*

SMC Response: Concur.

Action Taken: Additional justification for the cost of survey equipment shown in the DFP will be captured in Revision 1.

(12) Adjust the Cost Estimate as Necessary to Reflect Current Dollars (Draft Regulatory Guide DG-3014, pages 22 and 23): It is not clear whether the overall cost estimate submitted by the Licensee has been adjusted to reflect current dollars. For example, according to page 9 of Appendix C to the DFP, the estimated cost of the waste disposal cap is based on the 1996 costs for construction of a similar waste disposal cap at another facility. Pages 22 and 23 of Draft Regulatory Guide 3014 state that cost estimates should be adjusted for inflation and other changes in the price of goods and services.

To ensure that the cost estimate is adequate, the Licensee should adjust all costs as necessary to reflect current dollars.

SMC Response: The cost estimate contained in the DFP submitted to the USNRC previously were based upon the price of goods and services in 1999.

Action Taken: When Revision 1 is prepared, wording demonstrating that today's cost of goods and services was used for the DFP cost estimates will be included. In addition, changes will be made, as necessary, to ensure consistency with 2001 dollars.