

From: Marjorie McLaughlin *RY*
To: Orysia Masnyk Bailey
Date: 10/31/2007 2:15:53 PM
Subject: Whittaker SER

Orysia,

I found the SER for Whittaker. I remember now how this happened. Marie had wanted me to do one for a license amendment. I started to do it, but then successfully convinced her that it was not required. I got about halfway through. So, I attached what there is. I hope this helps,

Marjey

Marjorie McLaughlin

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Subject: Whittaker SER
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From: Marjorie McLaughlin

Created By: MMM3@nrc.gov

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nrc.gov kp1_po.KP_DO PM	Delivered	10/31/2007 2:15:53
OMM (Orysia Masnyk Bailey) PM	Opened	10/31/2007 2:16:15
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kp1_po.KP_DO	10/31/2007 2:15:53 PM	nrc.gov

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FROM: Marjorie McLaughlin, Project manager, Decommissioning Branch

THRU: Marie Miller, Chief, Decommissioning Branch

SUBJECT: WHITTAKER CORPORATION, LICENSE RENEWAL AND AMENDMENT
SAFETY EVALUATION REPORT

Section 1.0 Executive Summary

In a letter dated May 20, 2004, Region I received a request for an amendment to NRC License No. SMA-1018 to allow for the excavation, crushing, and blending of licensed material to meet the Waste Acceptance Criteria for disposal at a waste facility (Waste Control Specialists, in Andrews, Texas). In an letter dated May 28, 2004, Region I received an application for renewal of License No. SMA-1018. In the renewal application, the licensee requested replacement of three documents tied down to the license with revised versions of the documents. The licensee requested replacing the Groundwater Monitoring Plan with a revised version that was submitted with the application. The licensee also requested replacing the "Surveillance, Maintenance, and Control Plan" with the specific controls documented in the renewal package (i.e. these controls are no longer included as a separate procedure). Finally, the licensee requested replacing the "Soil Erosion Control Plan" with a revised plan, named "Erosion and Sediment Pollution Control Plan for Phase I and Phase 2 Activities at the Whittaker Remediation Site".

The amendment and the renewal of this license are being processed simultaneously. An Environmental Assessment and Finding of No Significant Impact has been prepared for these actions. The NRC staff has determined that Whittaker Corporation (Whittaker) has provided sufficient information to aid NRC staff in evaluating their planned activities to ensure they can be conducted in accordance with NRC requirements. This SER has been prepared to document the evaluation of amendment and renewal of this license.

Section 2.0 Facility Operating History

License No. SMA-1018 was issued in 1969 to Mercer Alloys Corporation, which performed the processing of ferro-columbium, ferro-nickel, and ferro-molybdenum. Some of the raw materials and feedstock used in these processes contained licensable quantities of natural thorium or uranium. Most of these materials contained quantities that were less than licensable, or trace quantities. The thorium and uranium were concentrated in the waste and slag materials that were a byproduct of the metal processing. In 1973, Mercer Alloys was purchased by Whittaker Corporation. Processing operations utilizing licensable materials ceased in 1975, and decommissioning activities began. A portion of the facility was decontaminated and released for unrestricted use in 1985, and is presently occupied by the Greenville Metals plant. The remaining site was placed on the NRC Site Decommissioning Management Plan (SDMP) list for sites that exceed the criteria for release for unrestricted use, but do not present an immediate threat to the health and safety of the public. Whittaker Corporation has been maintaining control over the radioactive materials at the site while developing a plan for remediation.

Section 3.0 Facility Description

The current Whittaker site is a irregularly-shaped, 5.9 acre strip of land located approximately 3.5 miles south of Greenville, PA, between the Greenville Metals Plant and the Shenango River. Slag byproducts from processing operations were disposed in areas encompassed by the present site. The land has been built up over time through repeated disposal of foundry slag, scrap metal, building rubble, and debris from general operations. The present surfaces are not level with the general elevations ranging from approximately 945-955 ft above mean sea level. The tops of the slopes are approximately 20-30 ft above the adjoining river floodplain, and there are piles of slag that reach an elevation of more than 957 ft. There are no remaining buildings, and the surrounding area of the site is primarily rural, although the site itself is located within a small industrial facility (Reynold Industrial Park). Adjoining property owners include Greenville Metals, the Reynolds Water Company, and the US Army Corps of Engineers. A fourth adjoining property is a privately-owned parcel, although the township cannot locate the owner. The site is entered from the access road for the Greenville Metals Plant. The entire Whittaker site is surrounded with fencing.

There are four main sections of the site:

Section 1 is the southern portion, bordered by a ravine on the north, Greenville Metals on the west and south, and floodplain on the east. It consists primarily of gravelly-slag and numerous pieces of metal scrap (the slag-covered portion is approximately 3020 m²). Section 1 is sparsely vegetated, with no structures, fixed equipment, or paved areas.

Section 2 is the central portion of the site, bordered by Section 3 to the north, Greenville Metals to the west, the ravine to the south, and floodplain on the east. Approximately 5050 m² of Section 2 contains slag in several piles at heights 6-10 m above the floodplain. One pile of gray slag material in the northern area of this section exhibit the highest dose rates of any material on site. Section 2 is similarly vegetated to Section 1. There are no structures or fixed equipment, and a small area in the west-central portion is covered by a concrete pad.

Section 3 is the largest area (6200 m²) and is the northernmost section of the waste and slag storage. It is bounded by the water company property to the northeast, Greenville Metals to the north and west, Section 2 to the south, and floodplain to the east. This section varies in height from 6-8 m above the floodplain. The eastern half of Section 3 is a large flat plateau that ends in a steep embankment down to the river floodplain. It is mostly soil with numerous small pieces of metal scrap on the surface. Corroded steel drums, building materials, and wood are scattered on the embankments. The western half consists of a large pile of slag and soil mixture, storage bins, rows of full 55-gallon drums, and bins containing radioactive slag. A larger concrete slab that was used to stage and store materials covers this area. The vegetation is more extensive than in other sections, with the upper areas containing weeds, grasses, and small trees, and the embankments containing larger trees and more vegetation.

Section 4 is a narrow strip of steep embankment connecting Section 1 in the south to the southwest tip of Section 2. The embankment averages about 15m wide and 6m above the ravine, and encompasses approximately 500 m². It is bordered on the north and west with the Greenville Metals property and its eastern edge is at the bottom of the slope in the ravine. It is similarly vegetated to the other embankments, and there are scattered slag, metal, and debris.

In addition to the four sections, there is a large triangular shaped ravine area within the

Whittaker boundary. It is located between Section 2 to the north, Section 4 to the west, and Section 1 to the south. There are two small discharge ponds, their drainage streams, and a small ridge of land separating the streams that rises to 6m above them. The vegetation consists of heavy undergrowth in the lower floodplain and trees along the upper elevations. There are no structures, paved areas, or fixed equipment, other than two large concrete culverts that discharge from the Industrial Park to the two streams. The majority of the river floodplain is outside the Whittaker site boundaries. The floodplain forms a border between the site and the Shenango River, and varies in width from less than 3m in the central portion of the site to 46m at the southern and northern ends. Vegetation is moderate to dense, with weeds, grasses, and trees. The site contains wetlands between the base of the slopes and the river.

The soil makeup of the site varies from natural soil types to slag and other materials deposited over the years. Soils range from well to very-poorly drained, gently-sloping to steep, and sandy to gravelly deposits. Quarterly site inspections have identified no signs of significant erosion, although some slopes outside the excavation area containing only native soil have shown signs of some erosion.

The Shenango River receives most of the runoff from the Whittaker site, along with the two unnamed streams (which discharge into the river).

Final disposition of the Whittaker site is currently unknown. Due to its location and the surrounding properties, future residential use seems unlikely.

Section 4.0 Radiological Status of the Facility

There is contaminated soil and slag, and also 20 storage bins containing contaminated materials. This material includes scrap from the licensed operations and also from the cleanup of the portion of the site that was released in 1985. Residual radioactivity exists in varying concentrations and depths throughout the site, although the vast majority of the slag and radioactive material is contained in the central and southern portions, and in an area in the northeast corner. There are indications of the subsurface disposal of contaminated waste slag and other materials to depths as deep as 5 meters. The concrete pad portion of the site, site embankments, and areas at the bases of embankments contain primarily surface debris. The radiological contaminants consist of natural thorium and uranium, and their daughter products in approximate secular equilibrium. Analysis of slag materials also shows that uranium-238 exists in some materials in disequilibrium with its decay products.

Samples from characterization and routine sampling of the radiological status of surface water and groundwater, and routine site surveillance activities, have not detected the presence of residual radioactivity.

The requested license amendment is to allow the excavation, crushing, and blending of currently licensed slag and slag-like wastes. The operation will blend materials with uranium and/or thorium concentration greater than 0.05% by weight with lower activity materials to create a homogenous mixture of waste containing unimportant quantities of source material in accordance with 10 CFR 40.13. This material will be shipped to a non-NRC-licensed facility (WCS) for disposal. WCS is licensed by the State of Texas to accept radioactive material. In addition, WCS is Resource Conservation and Recovery Act (RCRA)-permitted to accept hazardous waste.

Site waste materials fall into one of three broad categories: Type I, Type II, and Type III materials. The categories are defined in the amendment request as:

- Type I: Material containing > 0.05% by weight uranium and/or thorium
- Type II: Material containing < 0.05% by weight uranium and/or thorium, but with concentrations above the criteria that would be acceptable for unconditional release
- Type III: Material containing concentrations of uranium and/or thorium below the criteria that would be acceptable for unconditional release.

Whittaker's proposal is to blend the Type I and Type II materials to meet the WAC for disposal at the WCS facility. On June 22, 2004, Whittaker Corporation submitted proposed derived concentration guideline levels (DCGLs) to be used both for defining the Type II and Type III material and for releasing the site for unrestricted use.

Section 5 Dose Modeling

NRC evaluated the proposed DCGLs in a Technical Assistance Request, dated March 2, 2005 (ADAMS Accession No. ML050600412). The DCGLs were derived for the Industrial Land Use Scenario, and are:

- U-238- 166.5 pCi/g,
- U-238 + Daughters - 9.7 pCi/g, and
- Th-232 + Daughters - 7.0 pCi/g

The evaluation documented in the TAR determined that the proposed DCGLs are acceptable.

Section 6 Environmental Information

The Whittaker proposal of blending licensed materials includes excavation and staging of radioactive materials, segregated by type. After the material has been staged, the licensee will utilize a portable onsite crusher, feeding a ratio of Type I to Type II material to achieve the blend required to meet the WAC. The crusher has an internal water spray to control dust. Additionally, Whittaker will utilize external water sprays and will monitor airborne contamination levels. The blended material will be stored and then loaded into end-dump transport vehicles, and shipped to WCS for disposal. Based on its review, the staff has determined that the activities associated with the excavation, crushing, and blending at the Whittaker Corporation's facilities will have no significant environmental impact. The NRC has found no other activities in the area that could result in cumulative impacts.

Section 7 ALARA Analysis

NRC evaluated the Whittaker Dose Analysis for the amendment to the license to perform crushing and blending activities. The evaluation is contained in a Technical Assistance Request, dated November 10, 2004 (ADAMS Accession No. ML042940681). The evaluation specifically considers the exposure that will be received by WCS RP Technicians and an onsite and an offsite truck driver, and a railroad crew member and rail station employees. The TAR determined that the estimated doses to be received by all above individuals (< 1 mrem for all but the offsite truck driver, whose estimated exposure was 3.7 mrem) are reasonable and acceptable. For Whittaker's onsite workers, exposure monitoring will be performed, and the licensee will utilize standard dose reduction methods.

Section 8 Planned Activities

Renewal and amendment of the Whittaker license will permit the following activities: Decontamination and Decommissioning of site; packaging stock material and radwaste and storing it prior to shipment; and crushing and blending of radwaste for disposal at an offsite facility. The specific activities that will be taking place are:

Identification of Radioactive Materials: Last year, Whittaker's contractor, SCIENTECH performed a site characterization, which was a walkover gamma survey of Sections 1 and 2, and some exploratory excavations. This was done to estimate the locations of Types 1, 2, and 3 material. The locations of each type were flagged and mapped.

Excavation and Staging: This past spring, Whittaker began excavating the material identified in the characterization survey. As the material is excavated, a portion of it is sampled to verify that the material is of the type expected from the walkover survey. The excavated material is then staged in segregated piles according to material type. SCIENTECH will then determine the average activity of each pile to determine the blending ratios needed to lower the average bulk container activity to the WCS WAC.

Crushing and Blending: Because space at the site is limited, some crushing and blending may occur before all material has been excavated. When it does take place, SCIENTECH will feed the Type 1 and Type 2 material in the determined ratio into a track-mounted crusher. Passing the material into the crusher this way will result in both size reduction and blending of the material. The resulting material will be sampled and analyzed using an onsite gamma spectroscopy system.

Waste Loading, Transportation, and Disposal: Material will be loaded onto end-dump transport vehicles directly from the crusher, with the quantitative analysis described above serving as the data of record for the waste shipment. The material will be transferred to rail cars and shipped to WCS.

Section 9 Project Management and Organization

Whittaker Corporation is the licensee, and has retained the services of SCIENTECH, Inc. for oversight of this site. SCIENTECH has performed the Radiation Safety functions at the Whittaker site since 2002. An Organization Chart was submitted with the renewal request. There is a Whittaker Project Manager, a SCIENTECH Project Manager, the SCIENTECH RSO, a SCIENTECH Site Supervisor, and approximately 7 technicians and contractors (HPs, Rad Engineer, Operators, and Laborers).

The site supervisor and technicians and contractors are working at the site 6 days per week, 10 hours per day. The RSO and SCIENTECH Project manager visit the site regularly. The SCIENTECH PM provides monthly updates to the Whittaker PM. All personnel and contractors entering the Whittaker restricted area receive both classroom and practical Radiation Worker Training

Section 10 Health and Safety Program

Rad Safety Controls and Worker Monitoring: SCIENTECH utilizes a Radiation Safety Program that is described in the Rad Safety Manual they included with the renewal application. The radiation dose limits for workers are administratively set below the limits in 10 CFR 20 (e.g., TEDE limit is 2 Rem, LDE is 5 Rem).

One extension beyond the admin limits per year may be granted to a worker, but not above the regulatory limits. Minors are not permitted to enter SCIENTECH-controlled facilities at all. Pregnant workers are limited to 0.05 rem/month during the declared pregnancy.

Section 11 Environmental Monitoring and Control

Section 12 Radioactive Waste Management

Section 13 Quality Assurance

Section 14 Radiation Surveys

Section 15 Financial Assurance

Section 16 Restricted Use/Alternate Criteria