

Rocky Mountain Arsenal (RMA) occupies more than 17,000 acres (approximately 27 square miles) in Adams County, directly northeast of metropolitan Denver, Colorado (Figure 2-1). The property was purchased by the US government in 1942 for use in World War II to manufacture and assemble chemical warfare materials, such as mustard and lewisite, and incendiary munitions. Starting in the 1950s, Rocky Mountain Arsenal produced the nerve agent GB (isopropyl methylphosphonofluoridate) until late 1969. A significant amount of chemical warfare materials destruction took place during the 1950s and 1960s. Since 1970, RMA has primarily been involved with the destruction of chemical warfare materials. In addition to these military activities, major portions of the plant facilities were leased to private industries, including Shell Oil Company, between 1947 and 1982, for the manufacture of various insecticides and herbicides.

The M-1 Settling Basins are located in the South Plants area, just south of December 7th Avenue along the northern edge of the northwest quarter of Section 1. The basins and the berms surrounding them, all of which are now buried and partially built upon, occupy an area of approximately 34,500 square feet (Figure 2-2).

The M-1 Settling Basins were constructed to treat waste fluids from the lewisite facility. Two basins were constructed in 1942, and a third basin was constructed in 1943 when the original two filled with solids. All three were unlined, and each measured approximately 90 feet wide, 115 feet long, and 7 feet deep. In addition to the waste fluids from the lewisite disposal facility, the basins may have contained lesser amounts of waste materials from alleged spills within the acetylene generation building, the thionylchloride plant, and the arsenic trichloride plant, which may have been routed through floor drains and the connecting piping to the basins (Ebasco 1987). The basins also received a considerable amount of mercuric chloride catalyst, possibly from a spill (Ebasco 1988).

The liquids discharged into the basins first passed through a set of reactor towers where calcium carbonate was added, then through a wood trough into the M-1 Settling Basins where the arsenic precipitated out of solution. The elutriate was decanted through an 18-inch-diameter pipe to the Lime Settling Basins in Section 36 where final treatment occurred, prior to being routed to Basin A (Ebasco 1987).

The M-1 Settling Basins were backfilled, probably in 1947, and are now covered with soil. Portions of the basins are covered with structures. These structures would need to be removed before implementation of most IRA alternatives. For the purpose of the alternatives assessment it was estimated that approximately 6,400 yd<sup>3</sup> of sludge plus 2,600 yd<sup>3</sup> of soil overburden would be addressed by this IRA.

Based on several investigations, the contaminants in the waste material in the M-1 Settling Basins are primarily arsenic (about 8 percent) and mercury (about 0.5 percent), with the bulk of the material being oxides or carbonates of calcium. Organochlorine pesticides and other organics have also been found in the near-surface soils (Ebasco 1988). The M-1 Settling Basins are a direct source of arsenic contamination to the groundwater (RMA data base and WCC 1989).

On February 1, 1988, a proposed Consent Decree was lodged in the case of United States v. Shell Oil Company with the US District Court in Denver, Colorado. The proposed Consent Decree was revised after public comments were received, and a modified proposed Consent Decree was lodged with the Court on June 7, 1988. In February 1989, a Federal Facility Agreement was entered into between five federal agencies: the Environmental Protection Agency, the Army, the Department of the Interior, the Department of Health and Human Services, and the Department of Justice, which established procedures for implementing the Arsenal cleanup program as specified in the Technical Program Plan and incorporates the modified proposed Consent Decree. The Army and Shell Oil Company agreed to share certain costs of the remediation to be developed and performed under the oversight of the US Environmental Protection Agency, with opportunities for participation by the State of Colorado. The long-term remediation is a complex task that will take several years to complete. The Federal Facility Agreement specifies 13 Interim Response Actions (IRAs) determined to be necessary and appropriate. The Remediation of Other Contamination Sources is one of the 13 IRAs. The M-1 Settling Basins area is one of the other contamination sources.

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