UMTRA Ground Water Project

Ground Water Compliance Action Plan for the Canonsburg, Pennsylvania, UMTRA Project Site

February 2000

Prepared by
U.S. Department of Energy
Grand Junction Office
Grand Junction, Colorado

Project Number UGW–511–0005–01–000
Document Number U0035901

Work Performed under DOE Contract No. DE–AC13–96GJ87335

Contents

1.0 Introduction 1
2.0 Ground Water Compliance 1
2.1 Assessment of Environmental Data 3
2.2 Ground Water Contaminants 3
2.3 Applicability of Alternate Concentration Limits 3
2.4 Compliance Strategy Selection 4
3.0 Implementation 4
4.0 Environmental Considerations 7
5.0 References 9

Figures

Figure 1. Compliance Selection Framework, Canonsburg, Pennsylvania, Site 2
Figure 2. Monitoring Locations at the Canonsburg, Pennsylvania, Site 5

Attachment

Application for Alternate Concentration Limits for the Canonsburg, Pennsylvania, UMTRA Project Site

1.0 Introduction

This Ground Water Compliance Action Plan (GCAP) along with the attached Application for Alternate Concentration Limits will serve as a stand-alone modification to the *Remedial Action Plan for Stabilization of the Inactive Uranium Mill Tailings Site at Canonsburg, Pennsylvania* (DOE 1983) and is the concurrence document for compliance with Subpart B of 40 CFR 192 for the Canonsburg site. No section in the Remedial Action Plan refers specifically to ground water restoration and the deferral of Subpart B compliance. The initial standards were released by the U.S. Environmental Protection Agency (EPA) in January 1983, just before the Remedial Action Plan was issued, and at that time the focus was primarily on compliance with Subpart A at the disposal site. In the preamble to the final rule for 40 CFR 192 (published in the Federal Register of 11 January 1995 [60 FR 2854]), the EPA considered the Canonsburg site separately in the regulations because the disposal design was based on standards remanded in part in September 1985. Also, the EPA indicated that the Canonsburg site qualifies for an alternate concentration limit (ACL) under 40 CFR 192.02(c)(3)(ii) because any contamination that might seep from the encapsulated tailings will reach the surface within the site boundary, and will then be diluted by water in Chartiers Creek to insignificant levels.

The proposed compliance strategy for the Canonsburg site is based on the "compliance strategy selection framework" following the steps prescribed in Section 2.1 of the *Final Programmatic Environmental Impact Statement for the Uranium Mill Tailings Remedial Action Ground Water Project* (PEIS) (DOE 1996) (Figure 1). The proposed action is presented in the GCAP because a Site Observational Work Plan (SOWP) was not prepared for the site. National Environmental Policy Act (NEPA) issues and environmental concerns are also addressed in the GCAP and this information has been made available to citizens and public officials in the Canonsburg area.

2.0 Ground Water Compliance

To achieve compliance with Subpart B of 40 CFR 192 at the Canonsburg site, the U.S. Department of Energy (DOE) proposed action is no remediation in conjunction with the application of ACLs (see the attached ACL Application). The compliance strategy will include ground water monitoring and institutional controls to ensure that the application of ACLs will continue to be protective of human health and the environment. This determination uses a consistent and objective strategy selection framework developed in the PEIS (Figure 1). This strategy is based on site investigation data and computer modeling predictions indicating that natural ground water movement and geochemical attenuation processes will reduce uranium concentrations in ground water to less than the maximum concentration limit (MCL) or background levels within 30 years. Ground water in the uppermost aquifer in the vicinity of the site is not currently and is not projected to become a source for a public water system subject to provisions of the Safe Drinking Water Act.

In applying the decision framework developed in the PEIS as the strategy selection process, DOE has determined that ground water in the uppermost aquifer was contaminated by processing of radioactive materials at the Canonsburg site. The uppermost aquifer qualifies for no remediation in conjunction with the application of ACLs based on (1) water quality results from

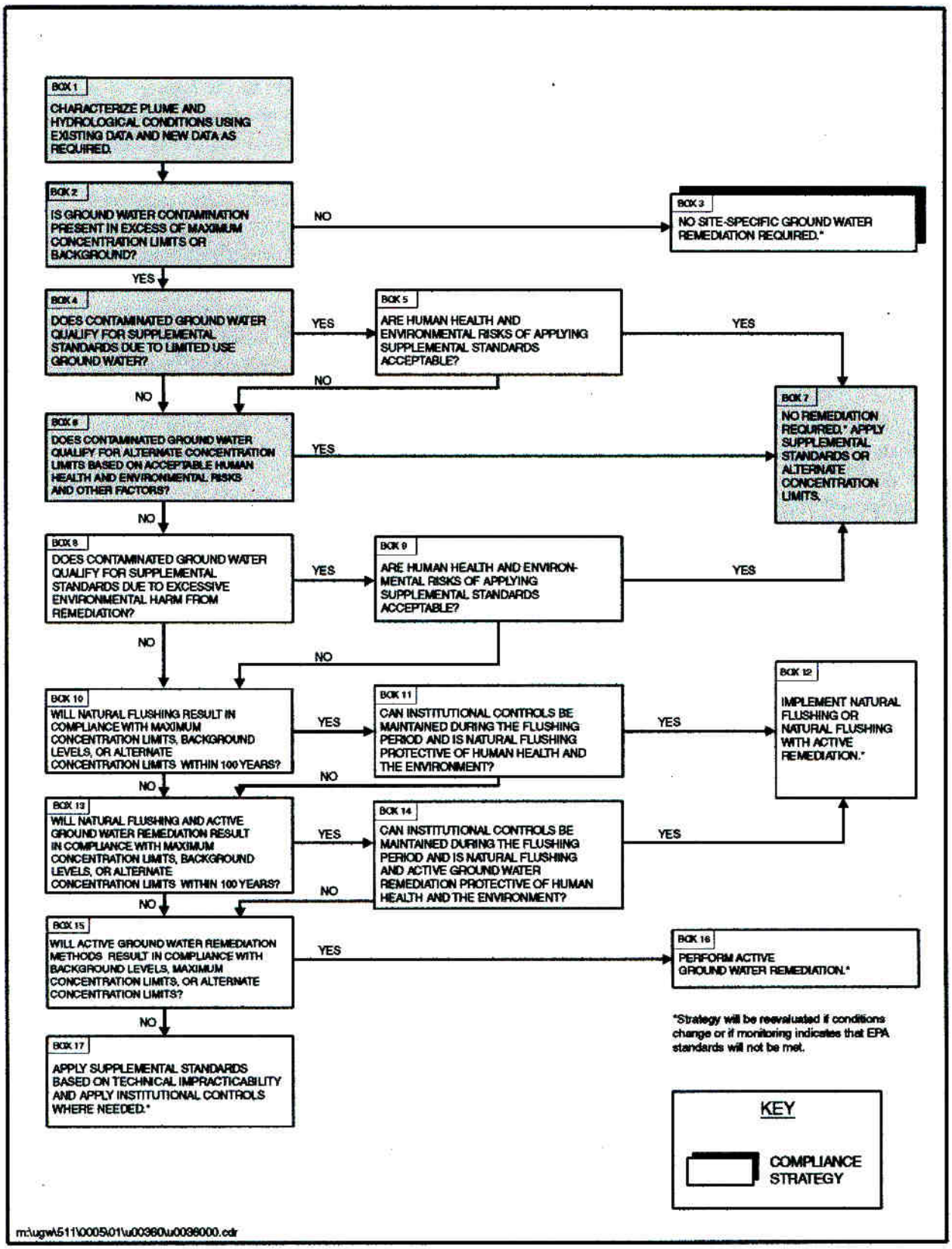

Figure 1. Compliance Selection Framework, Canonsburg, Pennsylvania, Site

approximately 17 years of data collection at the site, (2) probabilistic flow and solute transport modeling depicting contaminant concentrations to the year 2027, (3) viability of enforceable institutional controls that will prevent inappropriate uses of contaminated ground water during the period of ACL application, and that will ensure protection of human health and the environment, and (4) compliance monitoring that will verify the decrease in contaminant concentrations as predicted. The framework as applied to the Canonsburg site consists of several evaluative steps that are discussed below.

2.1 Assessment of Environmental Data

The first step in the decision process was an assessment of both historical and new environmental data collected to characterize hydrogeological conditions and the extent of ground water contamination related to processing activities at the site. The uppermost aquifer consists of unconsolidated materials, which overlie bedrock of the Pennsylvanian Casselman Formation. Although some ground water is present in the unconsolidated materials and shallow bedrock beneath the site, neither unit is considered a viable aquifer from a water resource perspective. Processing of radioactive materials at the Canonsburg site since the early 1900s has resulted in contamination of ground water in the uppermost aquifer beneath the main site, as well as in Area C (east of the main site). Constituents of potential concern (COPC) in ground water include manganese, molybdenum, and uranium. A number of other constituents have at times been identified in concentrations above MCLs or other benchmark concentrations in ground water since monitoring activities started. Distribution of contaminants in the unconsolidated materials is sporadic, and no well-defined contaminant plumes are apparent. Ground water from the uppermost aquifer discharges to Chartiers Creek, which is adjacent to the site on the west, north, and east sides. COPCs have not exceeded the MCLs or background levels in Chartiers Creek near the site. Evaluation of existing site data and predictive flow and solute transport modeling indicate that sufficient data exist to make an appropriate compliance strategy selection.

2.2 Ground Water Contaminants

The second step compares the list of ground water contaminants with MCLs or background levels. Manganese, molybdenum, and uranium are the site-related COPCs that are present in concentrations that exceed MCLs or background in ground water downgradient from the disposal cell and in Area C (DOE 1995). Manganese does not have an MCL in Table 1 to Subpart A of 40 CFR 192 but has a secondary drinking water standard (40 CFR 143) that has been exceeded at the site. An ACL is not required for manganese because it does not pose human health or ecological risks from ground water or surface water. In addition, manganese is elevated in background ground water as a result of regional activities unassociated with processing of radioactive materials at the Canonsburg site. Concentrations of molybdenum in ground water have been slightly elevated above the MCL in the past but are currently below the MCL. Uranium is the only constituent that is present at concentrations above the MCL in ground water and that clearly can be attributed to site activities. Therefore, uranium is the COPC at the Canonsburg site and is the focus of ground water modeling and compliance monitoring.

2.3 Applicability of Alternate Concentration Limits

The third step determines whether the contaminated ground water qualifies for ACLs based on acceptable human health and environmental risks. A site-specific ACL for a hazardous

constituent may be established if the constituent will not pose a substantial present or potential hazard to human health or the environment as long as the ACL is not exceeded, and if the proposed ACL value is as low as reasonably achievable, after considering practicable corrective actions. At the Canonsburg site, ground water monitoring and institutional controls will be implemented to ensure that the application of ACLs will continue to be protective of human health and the environment.

On the basis of periodic ground water sampling, it is anticipated that concentrations of the COPC (uranium) will be below the ACL and MCL within a limited period of time. Site-related contaminants have not been detected in Chartiers Creek adjacent to the site. Also, numerical modeling of ground water and surface water flow and transport at the site have predicted that concentrations at the point of compliance (POC) wells will be below the MCL in less than 30 years, and concentrations in surface water at the point of exposure (POE) are already well within acceptable concentrations with respect to human health and the environment.

Ground water in the vicinity of the Canonsburg site is not currently used as a drinking water source, nor is it projected to become one. Although limited ground water is present in the unconsolidated materials and shallow bedrock beneath the site, neither unit is considered a viable aquifer from a water resource perspective. Because the materials are not ideal for aquifer formation and the source of recharge to the shallow units is minimal, sustained yield from a well in these units is limited. Also, potable water near the site is available from a municipal water supply.

2.4 Compliance Strategy Selection

The fourth and final step in the framework is the selection of an appropriate compliance strategy to meet the EPA ground water protection standards. The selection is to perform no remediation in conjunction with an ACL for uranium (see the attached ACL Application). This strategy will include compliance monitoring and institutional controls to ensure protection of human health and the environment. The uppermost aquifer is not currently and is not projected to be a drinking water source in the vicinity of the site.

3.0 Implementation

To demonstrate compliance with the standards, DOE will monitor ground water in the POC wells (412, 413, and 414), monitor well 406, and at the POE (602), to ensure that the ACL for uranium of 1.0 mg/L at the POC and 0.010 mg/L at the POE are not exceeded and that uranium concentrations are decreasing with time (Figure 2). Ground water samples will be collected and analyzed for uranium, molybdenum, and manganese annually for a period no less than 5 years and up to 30 years. Re-evaluation of site conditions will be conducted after the 5 year period. If the compliance strategy is not proceeding as predicted, the site will be re-evaluated and the strategy will be modified as necessary. Termination of ground water monitoring or modification of the ground water compliance action plan strategy will not be made prior to NRC approval. Details of the ground water monitoring program will be incorporated into the revised Long-Term Surveillance Plan (LTSP) for the Canonsburg disposal site (DOE 2000).

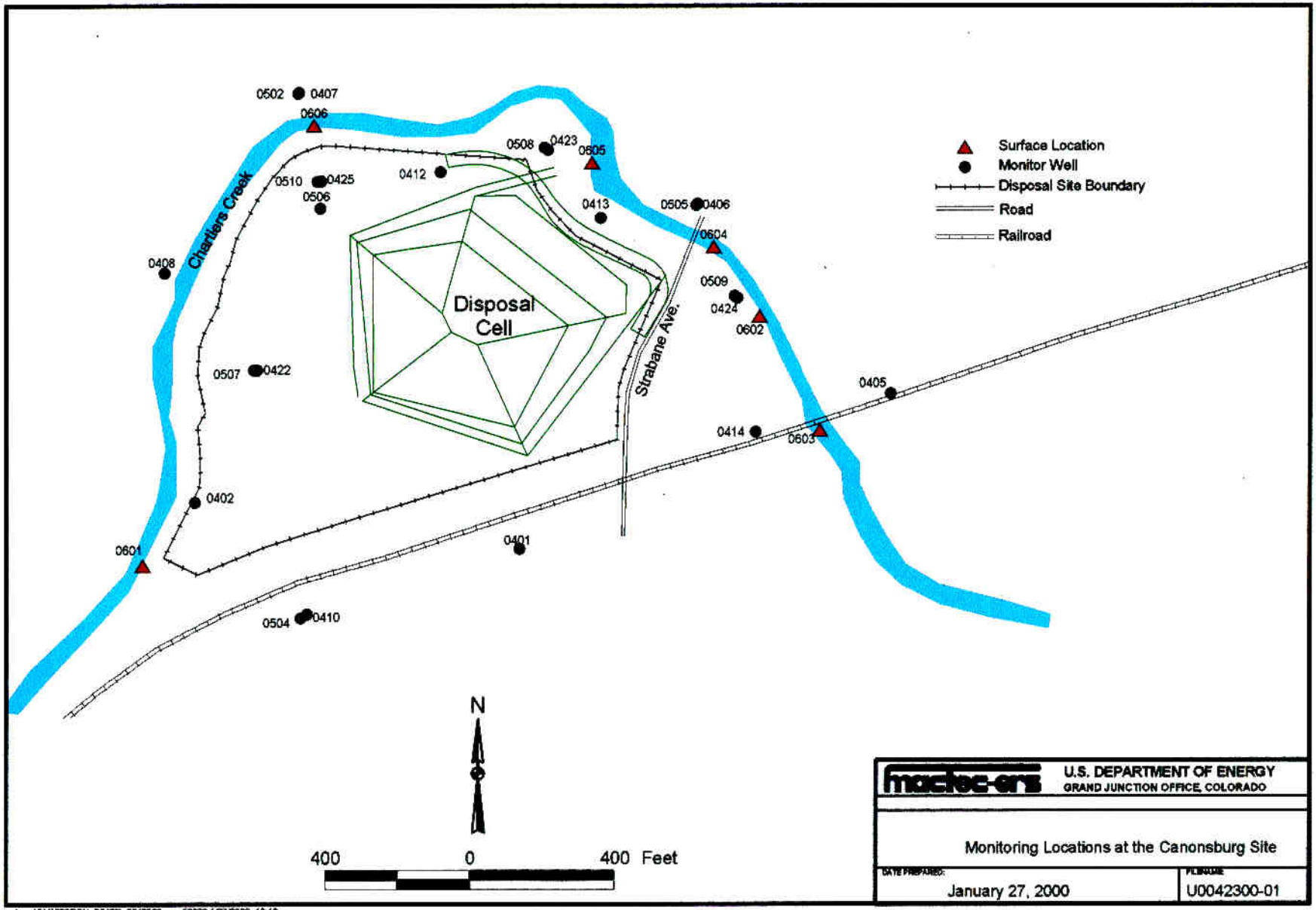

Figure 2. Monitoring Locations at the Canonsburg, Pennsylvania, Site

DOE and the Commonwealth of of Pennsylvania will ensure that appropriate institutional controls are put in place to prevent future use of ground water from the uppermost aquifer for whatever period is deemed necessary. These controls will also ensure that no unacceptable risks to human health and the environment are present during the period of ACL application.

4.0 Environmental Considerations

To comply with NEPA requirements DOE prepared the PEIS, which was issued in October 1996. A Record of Decision for the PEIS was issued in April 1997. The PEIS assesses the potential programmatic effects of conducting the ground water project, provides a method for determining the site-specific ground water compliance strategies, and provides data and information that can be used to prepare site-specific environmental impact analyses more efficiently. In the proposed action (preferred alternative), ground water compliance strategies are tailored to each site to achieve conditions that protect human health and the environment. The selection framework for determining an appropriate compliance strategy at each site is presented in Section 2.1 of the PEIS and is discussed in Section 2.0 of this GCAP. Relevant areas of environmental concern are discussed below.

Environmental issues and resources potentially affected by the proposed action may include the following:

- Risk to human health and the environment.
- Ground water use.
- Surface water use.
- Land use.
- Cultural resources.
- Socioeconomic and environment justice.

Environmental impacts from the proposed action on these issues and resources have been assessed in several of the referenced documents (DOE 1983, 1995, and 1996). Results are summarized below.

- The potential risk to human health is primarily through ingestion of ground water or surface water. Ground water use will be restricted through the implementation of institutional controls in the disposal area and in Area C. Analytical results have shown that concentrations of the COPC (uranium) have always been substantially below the MCL in surface water because of the significant dilution by Chartiers Creek. Therefore, surface water quality at the POE is not affected by site-related contamination. (See Sections 6 and 8 of DOE 1995 and Section 2.3 of the ACL Application).

- Based on available data, site-related contamination does not appear to pose a risk to ecological receptors from ground water, surface water, or sediments. (See Sections 7 and 8 of DOE 1995 and Section 2.3 of the ACL Application).

- DOE controls land and ground water use at the disposal site and the Commonwealth of Pennsylvania controls Area C. Institutional controls will be in place to restrict land and ground water use in Area C to perpetuate protection of human health and the environment.

- Cultural resources in the vicinity of the Canonsburg site have been inventoried, and there will be no impacts related to the application of ACLs. (See Section 6 of DOE 1995).

- There are no anticipated impacts to human populations. Therefore, there are no disproportionate affects to minority and low income populations. There are no impacts to the socioeconomic base of the neighborhoods in the vicinity of the site, since the contaminated surficial aquifer is not currently nor projected to be used by any population within a mile radius of the site. (See Section 6 of DOE 1995).

The cumulative effects analysis for the proposed compliance strategy is as follows:

- Based on the use of institutional controls, the presence of a small incremental effect to the ground water resulting from no remediation would not contribute to impacts resulting from other past, present, or reasonably foreseeable actions taken by the public and private entities in the area of the contamination. Contaminated ground water is not used for agriculture, irrigation, or drinking water (DOE 1995). Therefore, there would be no human health risks. There will be a long-term beneficial effect through natural attenuation processes that will result in acceptable ground water quality.

- Similarly, the presence of a small incremental effect to the surface water quality resulting from no ground water remediation would not significantly contribute to impacts from other past, present, or reasonably foreseeable actions taken by the public and private entities in the area of the reclaimed site. Acid mine drainage has contributed most of the surface water contamination in the region. Existing contaminated ground water is expected to migrate to Chartiers Creek. Surface water concentrations would remain below detection limits due to mixing, dilution, and dispersion (DOE 1995).

- The effects of no ground water remediation, when combined with those effects of other actions in the neighborhood of the reclaimed site do not result in cumulatively significant impacts (DOE 1996 and Section 5.0 of the ACL Application).

To accommodate the NEPA obligation to make relevant environmental information available to public officials and citizens before decisions are made and before actions are implemented, DOE has distributed relevant environmental documents, which are available for review in Pennsylvania and the Canonsburg area. Interaction with the stakeholders on the DOE ground water compliance strategy decision for the Canonsburg site was undertaken in the fall of 1998 in the Canonsburg area.

5.0 References

U.S. Department of Energy (DOE), 1983. *Remedial Action Plan for Stabilization of the Inactive Uranium Mill Tailings Site at Canonsburg, Pennsylvania*, UMTRA–DOE/AL–140, prepared by Jacobs Engineering Group, Inc.

———, 1995. *Baseline Risk Assessment of Ground Water Contamination at the Uranium Mill Tailings Site Near Canonsburg, Pennsylvania*, DOE/AL/62350–149, Rev. 1, prepared by Jacobs Engineering Group, Inc.

———, 1996. *Final Programmatic Environmental Impact Statement for the Uranium Mill Tailings Remedial Action Ground Water Project*, DOE/EIS–0198, prepared by the U.S. Department of Energy Grand Junction Projects Office, October.

———, 2000 (in progress). *Long-Term Surveillance Plan for the U.S. Department of Energy Canonsburg Uranium Mill Tailings Disposal Site, Canonsburg, Pennsylvania*.

End of current text