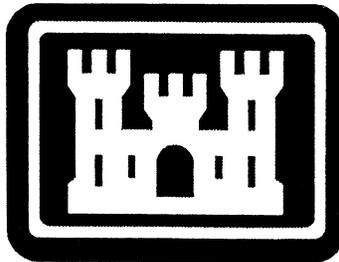
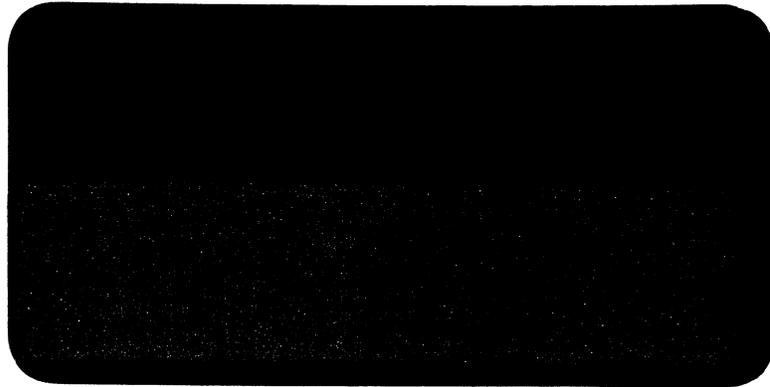


# US Army Corps of Engineers



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**AR-520**

## **EXPLANATION OF SIGNIFICANT DIFFERENCES**

### ***Marsh Run Park (former landfill) New Cumberland Army Depot New Cumberland Pennsylvania***

Marsh Run Park is the former landfill for the New Cumberland Army Depot, Fairview Township, New Cumberland, Pennsylvania. Beginning in 1987 the United States Army Corps of Engineers (USACE) has been leading the effort to address the environmental contamination present at this site.

In accordance with Section 117 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Federal Regulation 40 CFR 300.435(c)(2)(i) of the National Oil and Hazardous Substances Pollution Plan (NCP) an explanation of significant differences must be generated and made available to the public when there are significant differences between the remedial action to be taken and the remedy selected in the Record of Decision (ROD). This explanation of significant differences (ESD) will be contained in its entirety in the Administrative Record File for Marsh Run Park, in compliance with 40 CFR 300.825(a)(2). Locations for this Administrative Record File are given later in this ESD. In addition, the Administrative Record File contains previous documents with full technical details of remediation processes.

### **Site History, Contamination Problems, and Selected Remedy**

Marsh Run Park site was previously owned by the Army, who used it as a disposal of installation-derived waste materials from Defense Distribution Restoration Program (DDRE) starting in the early 1900s and ceasing in the late 1950s. The waste materials were deposited in a marshy area to a height of several feet above the water level of the swampy areas. The landfill material has subsequently been covered with soil excavated from a borrow area directly adjacent to and north of the site.

After the Marsh Run park site was sold to Fairview Township. The site was purchased by Fairview Township as a soccer field. The Township graded the site and brought in topsoil from an offsite location to make a suitable playing surface.

In August 1986, DDRE identified Marsh Run Park as an excess federal property under the Defense Environmental Restoration Program, and in April 1987, the Army commenced testing of the site. In August 1987, the Army received and shared preliminary test results with Fairview Township, and closed the park. In April 1988, preliminary test results were received and shared with Fairview Township.

Results showed that low levels of volatile organic compounds (VOCs) and metals existed in the subsurface soil and groundwater. On 9 May 1988, results confirmed that the wells were not contaminated. As a result of the low levels of VOCs and metals found by the preliminary Marsh Run Park investigation, the Army recommended that a follow-up study be performed to determine the extent of the VOCs and metals. On 11 May 1988, the Army released funds to perform the follow-up environmental studies of Marsh Run Park.

A Remedial Investigation/Feasibility Study (RI/FS) was conducted by USACE-Omaha District between 1988 and 1990 at the site. A Record of Decision (ROD) dated June 1991 was signed by the Pennsylvania Department of Environmental Protection (PADEP) in November 1991 and by the Department of the Army in July 1992. The ROD selected a remedy consisting of a groundwater pumping and treatment system for bedrock aquifer remediation, and soil venting for source area remediation. As stipulated by the ROD, a Groundwater Treatment Facility was designed. The design of the Marsh Run Park GWTF, also known as Operable Unit No. 1, was completed on 30 July 1994. Plant construction was completed on 30 July 1995.

This integrated system operated in the following manner. Initially, the shallow saturated zone within the source area was de-watered by pumping. Then, an extraction well system pumped out the water remaining in the bedrock aquifer for treatment in a two-stage ground-water treatment system. The extraction well system was located along the northern portion of the site to intercept contaminated bedrock aquifer water flowing towards the Susquehanna River. Concurrently, the soil venting system was to remove organic contamination from the source area using vacuum extraction. Once extracted, the contaminants were to be treated using the vapor treatment system. This soil venting system was never implemented beyond a pilot stage, due to the fire that destroyed the treatment plant. In addition, a long-term monitoring program was implemented to characterize the bedrock aquifer contamination over time, to measure the effects of contaminant treatment.

The GWTF operated for approximately 1 year and 4 months when, on 28 November 1996, it was destroyed by fire. Consequently, assessments were made as to whether to construct a new GWTF or to allow natural attenuation to complete the remediation of groundwater within the bedrock aquifer, while still treating the source area.

### Description of Significant Differences & the Basis for these Differences

On 28 November 1996, after operating for approximately one year and four months, the GWTF was destroyed by fire. By that time, numerous advances had been made in treatment technology. Additionally, USACE had accumulated sufficient monitoring data to conclude that the operation of Operable Unit No. 1 had been less effective than expected in removing contaminants from the ground water. Consequently, USACE re-evaluated the treatment design, and found that design changes to improve the remedy would be both desirable and cost-effective.

The original treatment system at the Marsh Run Park site had one major problem associated with it. The groundwater pump & treatment system was unable to control contaminant levels. This was due to several factors. The wells were not of sufficient diameter to extract the required groundwater for treating the contaminants effectively. Second, additional wells were needed to sufficiently lower the groundwater table. Therefore, contaminants reached the groundwater aquifer at a higher rate than anticipated. This overloaded the treatment system even further, resulting in a treatment system that was not meeting the remediation standards.

Between the time of the original design for the treatment system and the present, several advances have been made in the area of groundwater remediation. These include vacuum enhanced soil vapor extraction, and improved monitoring and sampling capability for groundwater. Soil vapor extraction (SVE) wells can now handle two phase extraction, meaning that drawdown of the water table with other wells is not necessary, as the enhanced SVE wells will perform this task. New technology also makes monitored natural attenuation a feasible remediation alternative, because site conditions can be sampled in a timely and cost efficient manner. Combining these two technological advances makes Monitored Natural Attenuation (MNA) a suitable remediation alternative for the site at Marsh Run Park. A comparison of the major aspects of the two treatment systems is presented in the following table:

ITEM	MODIFIED SYSTEM	ORIGINAL SYSTEM
Treatment Streams	Soil Vapor, Groundwater	Soil Vapor, Groundwater
Soil Vapor Treatment Method	Enhanced Soil Vapor Extraction	Soil Vapor Extraction
Soil Vapor Treatment Period	Two years	One year
Geosynthetic Cap	Placed over Source Area	None Present
Extracted Groundwater Treatment Method	Air Stripping plus Activated Carbon	Air Stripping plus Activated Carbon
Design Approach: Soil Vapor	Source Treatment	Source Treatment
Design Approach: Groundwater	Natural Attenuation	Containment

As the table indicates, the two systems are essentially the same. The modified system takes advantage of advances in soil vapor extraction technology. The natural attenuation process works by allowing geochemical conditions in the site area to break down chemical contamination in the groundwater. Through naturally occurring chemical processes, carbon based contaminants will change their composition in

several steps, eventually becoming harmless chemical species such as carbon dioxide. This process is monitored at several points using wells to measure the rate at which this breakdown is occurring. Due to favorable geochemical conditions at Marsh Run Park, analysis shows that chemical contaminants will break down so only trace amounts will be leaving the site boundaries. This makes MNA an effective treatment. The chemical and biological mechanisms by which this is accomplished are described in detail in the 1997 EA Engineering, Science, and Technology, Inc. report entitled: *Final Evaluation of Groundwater Treatment System Alternatives for the Remedial Design Activities at Marsh Run Park (former landfill) Defense Distribution East, New Cumberland, Pennsylvania.* This report describes the technical details of both the monitored natural attenuation process and the source area treatment by vacuum enhanced soil vapor extraction.

Details of the original remedy are more thoroughly covered in the Record of Decision. Both the ROD and the 1997 EA Engineering report are contained in the Administrative Record File for this site.

#### **Affirmation of the Statutory Determinations**

Considering the new information that has been developed and the changes that have been made to the selected remedy, the United States Army Corps of Engineers believes that the current remediation process remains highly protective of both human health and the environment. This remediation will attain Federal and State applicable or relevant and appropriate requirements (ARARs) for this remedial action, and is cost-effective. In addition, the revised remedy utilizes permanent solutions and alternatives treatment technologies to the maximum extent possible for this site.

**Public Notification Activities**

The explanation of significant differences is contained in the Administrative Record File for the remediation efforts at Marsh Run Park. Locations for viewing of this ESD as well as the Administrative Record for this remediation effort can be seen following this paragraph. In addition, a summary of this ESD was published in the Harrisburg Patriot News on 3 February 2002.

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