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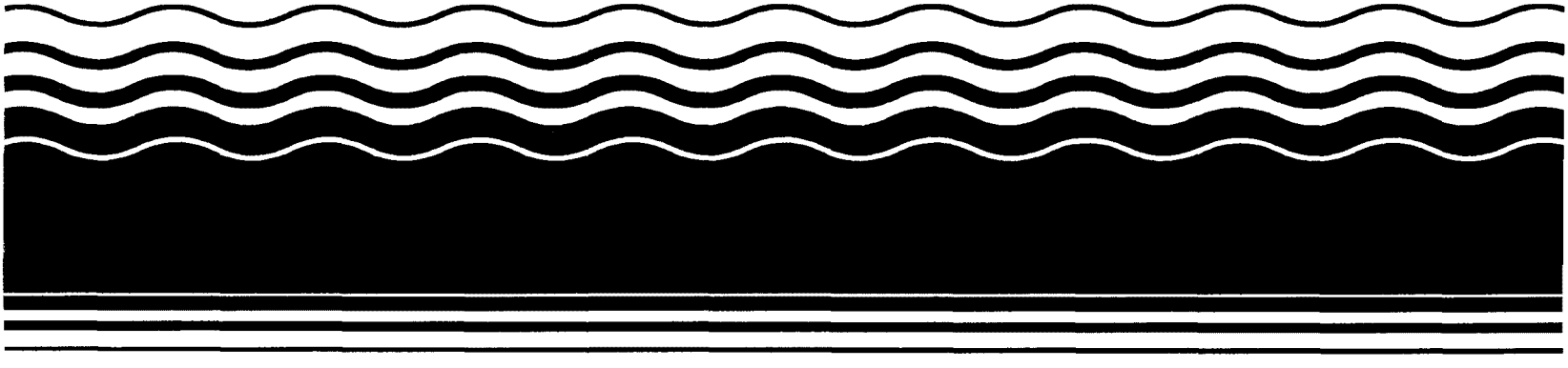
February 1996

EPA Superfund Record of Decision:

USDOE Oak Ridge Reservation, Kerr Hollow Quarry, Oak Ridge, TN 9/29/1995



DOE/OR/02-1398&D2

Record of Decision
for
Kerr Hollow Quarry at the Oak Ridge Y-12 Plant, Oak Ridge, Tennessee

PREFACE

This record of decision for Kerr Hollow Quarry (DOE/OR/02-1398&D2) was prepared in accordance with requirements under the Comprehensive Environmental Response, Compensation, and Liability Act to present the selected remedy to the public. The approved Resource Conservation and Recovery Act closure has been accepted as being protective of human health and the environment. This work was performed under Work Breakdown Structure 1.4.12.1 (Activity Data 2306 "Kerr Hollow Quarry"). This document provides the Environmental Restoration Program with information about the selected remedy for Kerr Hollow Quarry, which involves no further action to achieve protection of human health and the environment at the Kerr Hollow Quarry.

ACRONYMS AND ABBREVIATIONS

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	*Code of Federal Regulations*
DOE	U.S. Department of Energy
Energy Systems	Lockheed Martin Energy Systems
EPA	U.S. Environmental Protection Agency
ft	foot
gal	gallon
ha	hectare
kg	kilogram
km	kilometer
L	liter
m	meter
NPDES	National Pollutant Discharge Elimination System
ORO	Oak Ridge Operations
RCRA	Resource Conservation and Recovery Act
ROD	record of decision
TDEC	Tennessee Department of Environment and Conservation
Y-12 Plant	Oak Ridge Y-12 Plant
yd	yard

PART 1. DECLARATION

SITE NAME AND LOCATION

U.S. Department of Energy
Kerr Hollow Quarry at the Oak Ridge Y-12 Plant
Oak Ridge Reservation
Oak Ridge, Tennessee

STATEMENT OF BASIS AND PURPOSE

This document presents the decision for no further action at the Oak Ridge Y-12 Plant (Y-12 Plant) Kerr Hollow Quarry in Oak Ridge, Tennessee. The U.S. Environmental Protection Agency (EPA) has accepted the approved Resource Conservation and Recovery Act (RCRA) closure as being protective of human health and the environment. The closure also satisfies the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, and to the extent practicable, the National Oil and Hazardous Substances Contingency Plan. This record of decision (ROD) provides the public with a consolidated source of information about Kerr Hollow Quarry.

The state of Tennessee and EPA concur with the U.S. Department of Energy (DOE) in this decision for no further action at Kerr Hollow Quarry.

DESCRIPTION OF SELECTED REMEDY

Previous action taken was under an approved RCRA closure plan and approved by the Tennessee Department of Environment and Conservation (TDEC), and is protective of human health and the environment. Therefore, no further action is necessary under CERCLA. These closure activities were conducted as part of the RCRA closure, which fits with DOE's cleanup strategy to perform all response actions at the Oak Ridge site in accordance with federal and state laws, standards, limitations, and criteria.

DECLARATION STATEMENT

Kerr Hollow Quarry was closed according to RCRA regulatory guidance. Restricted access provides the necessary protection of human health and the environment, thus no further

remedial action is necessary under CERCLA to ensure adequate protection of human health and the environment. The status of this site under CERCLA will be reviewed every 5 years. Also, the status of this site will be reviewed as a part of the RCRA postclosure permit process at least every 10 years. Groundwater will be monitored as part of the RCRA postclosure permit requirements. Surface water contamination will be periodically monitored at the surface water discharge point from the quarry as a best management practice. If statistically significant contamination is detected in groundwater or surface water at the site, any remediation, if necessary, will be addressed under CERCLA.

APPROVALS

James Hall, Manager
U.S. Department of Energy
Oak Ridge Field Office

9-25-95
Date

Earl C. Leming, Director
U.S. Department of Energy Oversight Division
Tennessee Department of Environment and Conservation

9-25-95
Date

for John Hankinson, Regional Administrator
Region IV
U.S. Environmental Protection Agency

9-29-95
Date

PART 2. DECISION SUMMARY

SITE NAME, LOCATION, AND DESCRIPTION

The Y-12 Plant occupies approximately 320 ha (800 acres) of the DOE reservation and was built for the U.S. Army Corps of Engineers in the 1940s to support the Manhattan Project. Figure 2.1 shows a map of the site.

Kerr Hollow Quarry is a 1.2 ha (3-acre), flooded limestone rock quarry on the Oak Ridge Reservation about 2.5 km (1.5 miles) south of the Y-12 Plant and approximately 320 m (350 yd) north of Bethel Valley Road. Kerr Hollow Quarry is approximately 16.8 m (55 ft) deep and sheltered on three sides by 18.3-m (60-ft)-high cliffs. It was operated during the 1940s as a rock and gravel quarry, but was abandoned in the late 1940s and allowed to fill with water.

SITE HISTORY

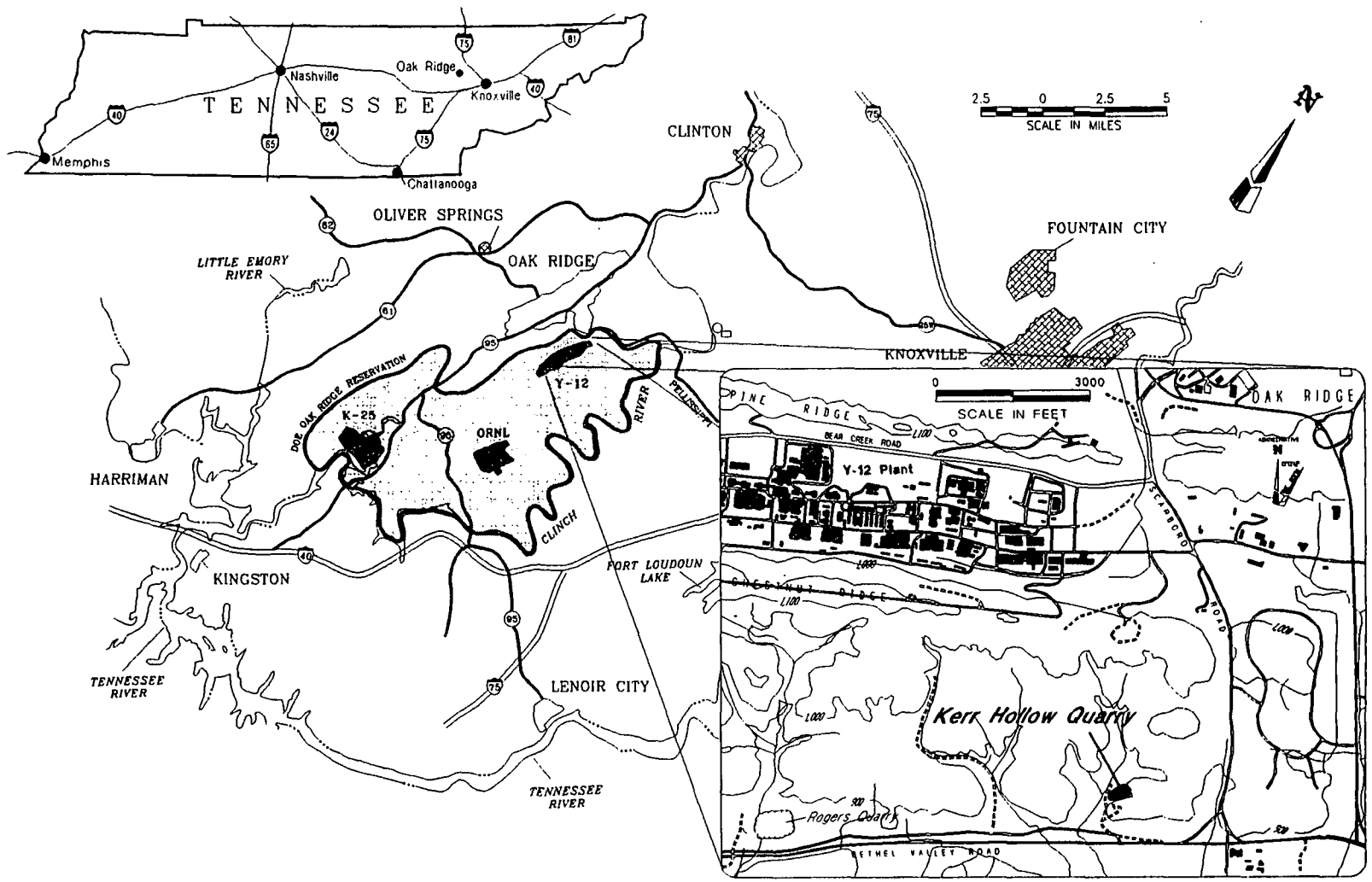
In the early 1940s, Clinton Engineering Works leased the Kerr Hollow Quarry site to Ralph Rogers Company, Inc., to provide rock and gravel for construction on the Manhattan Project. In the late 1940s, the quality of the stone degraded, the quarry was abandoned, and the quarry eventually filled with water.

The quarry was used as a treatment site for water-reactive, corrosive, or ignitable wastes from the Y-12 Plant and the Oak Ridge National Laboratory from 1951 until 1988. The site received containers of waste in various sizes consisting mainly of gas cylinders, drums, and buckets.

No disposal records are available for activities performed before 1957. Kerr Hollow Quarry was not intended for use as a hazardous waste storage or disposal facility. Instead, it was used to treat the wastes and effectively eliminate the hazardous characteristics of reactivity, corrosivity, and ignitability.

Records for Kerr Hollow Quarry, dating from 1957, show that approximately 45,450 kg (50 tons) of hazardous and nonhazardous waste were treated at the site. The estimated amount generally included the weight of the containers and the materials inside. There is no documented record of any enriched radiological material in the inventory.

Water-reactive materials such as lithium and sodium were normally packed in 20-, 120-, or 220-L (5-, 30-, 55-gal) containers. After arriving at the quarry, the containers were placed



JE	**Fig. 2.1**	**Regional location map** DOE - Y-12 Plant, Kerr Hollow Quarry - Oak Ridge, Tennessee	DOCUMENT ID: 35H830 7900-10 / ROD	DRAWING ID: 95-11781DWG	DRAWING DATE AUGUST 10, 1995 TR

on a chute and dropped into the water. Rifle fire from a protected location was used to puncture the containers, allowing water to enter and to react with the contents. A complete reaction of the metal was expected because of the violent nature of the explosion or violent burning that followed as the container sank below the surface of the water. Potentially explosive chemicals such as picric acid were suspended above the water surface, and their containers were punctured by rifle fire before being dropped into the water. Large pressurized vessels containing sodium were placed in the quarry with their valves and vent pipes in the open position, which allowed water to enter and react with the sodium as the vessel sank. Gas cylinders with frozen valves were vented on the bank of the quarry by puncturing the cylinder wall by rifle fire. After the early 1970s, the cylinders were returned to the Y-12 Plant for disposal; before then, the breached cylinders were discarded in the quarry.

Treatment activities at Kerr Hollow Quarry ceased on November 7, 1988. Effluent from Kerr Hollow Quarry has been monitored under the National Pollutant Discharge Elimination System (NPDES), Permit No. TN 0002968 - Outfall 301, as prescribed in the Clean Water Act.

During preparation for the RCRA closure in March 1989, a remotely operated underwater vehicle equipped with a camera surveyed the bottom of the quarry. Follow-up surveys were conducted in the spring and summer of 1990. From these surveys and inventory records, the containers, cylinders, and other materials viewed on the bottom of the quarry were documented as the baseline condition expected to be present. From 1991 through 1993, containers and materials at the bottom of Kerr Hollow Quarry were shredded, removed, evaluated by health physics personnel, and placed in B-25 boxes. Containers and other objects from the bottom of the quarry were shredded underwater to treat any reactive materials that might remain, thereby minimizing the hazardous effects from potential release of the residual material. Shredded debris from the quarry was placed in concrete vaults and placed adjacent to the Walk-in Pits in the Bear Creek Burial Grounds. The concrete vaults were subsequently covered with a RCRA cap according to the approved closure plans for both of those units.

Removal operations were stopped numerous times to evaluate and change operating procedures. Most of these procedural changes were for safety reasons. Because 10–15 percent of the gas cylinders in Kerr Hollow Quarry was still pressurized, a special procedure was developed for inspecting, breaching (if necessary), and removing cylinders.

Final removal and inspections began in January 1993, which required tracking the items removed and identifying the items that remained in Kerr Hollow Quarry. Items that could not shield reactive material from the water and prevent it from reacting (e.g., solid objects, metal and plastic sheets, container lids, broken glass, wire, and pieces of wood) and that were not

hazardous to human health and the environment were left in the quarry. Final waste removal and inspection were completed October 22, 1993. The last of the operating equipment was removed from the quarry November 11, 1993.

COMPLIANCE HISTORY

On October 11, 1987, in a letter to the deputy assistant manager for defense programs, the TDEC advised DOE-Oak Ridge Operations (ORO) that disposal into the quarry after November 7, 1988, could not be allowed under the Tennessee Water Quality Control Act. As determined by TDEC, Kerr Hollow Quarry was a surface impoundment subject to the 1984 Hazardous and Solid Waste Amendments of RCRA; consequently, the quarry either had to be retrofitted to meet technological requirements or be closed. In either case, further disposal was prohibited after November 7. DOE-ORO directed Lockheed Martin Energy Systems (Energy Systems) to submit a schedule of its closing by January 8, 1988, in a manner adequate to meet the closure requirements of a surface impoundment as specified in 40 *Code of Federal Regulations* (CFR) 265.

To comply with the TDEC directive, Energy Systems began a study of alternative methods of closure. An initial option of no action was eliminated after study. Lining the quarry was rejected on economic and technological bases. Removing all the water from the spring fed quarry was without precedent and immediately dismissed as a viable course of action. Some consideration was given to filling the quarry with rock, an alternative repudiated for cost and safety factors.

The original closure plan called for work to be performed in two phases: a survey (which would supplement the one done in 1987) to determine the extent of the debris in the quarry, and the subsequent removal, shredding, and disposal of the debris.

The closure plan for Kerr Hollow Quarry was submitted to TDEC and conditionally approved September 28, 1988, but was subsequently revised to reflect changes, as necessary. The changes were made and documented as R1. That document constitutes the base plan authorized by TDEC in 1988.

The D2 version of the Kerr Hollow Quarry closure plan was approved in April 1993 to clarify the short-term storage of shredded debris and to more clearly identify the partial closure

and final closure requirements. The closure classification was changed from "clean" to "dirty" due to the possibility that some contaminated material may remain buried in sediment at the bottom of the quarry.

The D3 version to the closure plan was approved July 6, 1993, which reflects the reclassification of the shredded debris from RCRA to non-RCRA status based on statutory interpretation and the disposition of the debris at the Walk-in Pits in the Bear Creek Burial Ground at the Y-12 Plant. Reclassification of the shredded debris was drawn from 40 CFR 268.42. From that interpretation, the shredded debris, having received water-reactive treatment through shredding, met the technology-based standard. Thus, it was not subject to further land disposal restrictions.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

The public comment period for the Kerr Hollow Quarry no further action proposed plan began June 12, 1995. This proposed plan was made available in the Administrative Record File maintained at the DOE Information Resource Center beginning the first day of the public comment period. The notice of availability was published in the *Knoxville News-Sentinel* June 19, 1995. The notice included a statement that a public meeting concerning the proposed plan would be arranged, if requested, by June 26, 1995. A public meeting was not requested. The public comment period was held from June 12 through July 18, 1995. No comments were received.

SCOPE AND ROLE OF THE SITE

The selected RCRA remedies involved removing the containers, cylinders, and other materials from the bottom of the quarry. The RCRA remedies prevent physical exposure to contaminants and mitigate further migration of contaminants from Kerr Hollow Quarry to groundwater or surface water runoff. These RCRA closure activities fit into DOE's cleanup strategy to undertake response actions at the Oak Ridge site in accordance with federal and state laws, standards, limitations, and criteria.

SUMMARY OF SITE CHARACTERISTICS

Containers and materials at the bottom of Kerr Hollow Quarry were shredded, removed, and evaluated by health physics personnel, and placed in B-25 boxes. Final removal and inspections were begun January 1993, which required tracking the items removed and identifying the items that remained in Kerr Hollow Quarry. Items that could not shield reactive material from the water and prevent it from reacting (e.g., solid objects, metal and plastic sheets, container lids, broken glass, wire, and pieces of wood), and that were not hazardous to human health and the environment, were left in the quarry.

Wells around Kerr Hollow Quarry were sampled before and during the removal operations as part of detection monitoring requirements. Results from monitoring the groundwater and quarry water have not shown contaminant concentrations in excess of regulatory standards. The surface water flowing from Kerr Hollow Quarry was also monitored adjacent to the quarry under an NPDES permit.

SUMMARY OF SITE RISKS

Kerr Hollow Quarry is within a remote, protected area of the Y-12 Plant across Chestnut Ridge from the main plant. Only designated and trained DOE or Energy Systems employees or subcontractors are allowed access to the quarry. Wildlife has access to the area and may use the water in and from Kerr Hollow Quarry.

Even though small quantities of contaminants may remain within Kerr Hollow Quarry, direct human exposure pathways do not exist and are not likely to exist in the foreseeable future because of the security fencing, locked gates, deed restrictions, and limited access that are part of the postclosure maintenance requirements (Rivera 1994). Some contaminants may be buried in sediments that are under 16.8 m (55 ft) of water, but making direct exposure to the public to such deep sediments is highly unlikely.

Data are insufficient to quantitatively document an ecological risk assessment for Kerr Hollow Quarry. However, a qualitative evaluation of potential ecological risks indicates no apparent ecological concern for Kerr Hollow Quarry, based on historical surface water analyses from NPDES Outfall No. 301. Because of its proximity to Kerr Hollow Quarry, this outfall was representative of Kerr Hollow Quarry surface and groundwater quality. To ensure continued protection of human health and the environment and to meet post-ROD requirements, DOE will

monitor groundwater and surface water quality. Groundwater monitoring will meet pertinent RCRA permit requirements and surface water monitoring will be conducted as a best management practice. The latest quarterly sampling results from monitoring indicate that groundwater contaminants are below levels of regulatory concern.

Beyond the potential risk from chronic exposure to contaminants in the Kerr Hollow Quarry sediments, there is also a potential acute risk from release of the contents from an unknown intact container that could remain in the quarry. The subsequent release of contaminants from such a cylinder or container degraded by rust could result in a significant, short-term release. Procedures required by the RCRA Closure Plan would not allow unacceptable risks to human health and the environment. A short-term release could result in a short duration ecological event, which is not anticipated because closeout activities indicate no such items were detected.

STATUTORY DETERMINATIONS

Kerr Hollow Quarry was closed according to RCRA regulatory guidance. Restricted access provides the necessary protection of human health and the environment to satisfy CERCLA requirements. Thus, no further remedial action is necessary under CERCLA to ensure adequate protection of human health and the environment. Under these circumstances, the statutory cleanup standards of CERCLA, Section 121, for example, are not triggered.

The status of this site under CERCLA will be reviewed every 5 years. Also, the status of this site will be reviewed as a part of the RCRA postclosure permit process at least every 10 years. Groundwater will be monitored under the RCRA postclosure permit requirements. Surface water will also be monitored at the surface water discharge point from the quarry periodically as a best management practice for contaminants. If statistically significant contamination is detected in groundwater or surface water at the site, any remediation will be addressed under CERCLA.

EXPLANATION OF SIGNIFICANT CHANGES

No significant changes have been made to the no further action decision selected in the proposed plan through the regulatory and public comment periods.

PART 3. RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY

DOE established a public comment period from June 12, 1995, through July 18, 1995, for interested parties to comment on DOE's proposed plan for Kerr Hollow Quarry. The proposed plan states that no further remedial action is necessary to protect human health and the environment at Kerr Hollow Quarry.

The 30-day comment period ended July 18, 1995. No comments on the Kerr Hollow Quarry proposed plan were available by that date and no comments were received by July 25, 1995, the latest date to accept mailed comments. In addition, no public meeting was requested; therefore, none was held.

REFERENCES

DOE (U.S. Department of Energy). 1995. *Proposed Plan for the Kerr Hollow Quarry at the Y-12 Plant, Oak Ridge, Tennessee*, DOE/OR/02-1352&D2. Oak Ridge, TN.

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Energy Systems (Martin Marietta Energy Systems, Inc.). December 1993. *Closure Certification Report for the Kerr Hollow Quarry Site at the Oak Ridge Y-12 Site, Oak Ridge, Tennessee*, Y/PF/01561. Oak Ridge, TN.