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OPERABLE UNIT DEFINITIONS, FERNALD RI/FS

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MEMORANDUM



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To: Distribution

Date: October 3, 1989

From: J. G. Yeasted JG4

Project No. 303317

Subject: OPERABLE UNIT DEFINITIONS, FERNALD RI/FS

The operable unit concept was developed as the remedial action management strategy for Fernald in August 1988. Since that time, some redefinition of operable units has occurred as a result of agency input and the progressive development of the sitewide strategy. This has caused some confusion in the current understanding of the operable units -- confusion that has been aggravated by the large number of new DOE, WMCO, and ASI/IT personnel involved in the RI/FS and ERA teams.

The purpose of this memo is to present the definition of operable units currently acknowledged by the RI/FS team. Some components of the operable units are apparent; others require specific justification and may be in disagreement with DOE's or WMCO's current understanding. Still other components can only be sorted out on a case-by-case basis in anticipation of the types of findings and remedial actions to be implemented. This memo will hopefully address all of these issues so that a definition of operable units mutually agreeable to all parties will be forthcoming. The anticipated revision to the FS Work Plan will serve as the formal mechanism to present this redefinition to the U.S. EPA and the OEPA.

It is important to note upfront that the selection of operable units was targeted toward the FS process and anticipated similarities in the nature and scope of the remedial action alternatives for each component of a given operable unit. This focus has caused and continues to cause some difficulties with several RI/FS activities such as data collection and analysis (in particular, the evaluation of complete source-pathway-receptor relationships in the risk assessment). These difficulties can usually be overcome, however, and any resultant task perturbations caused by a changing baseline appear to be worth the management and technical advantages being realized as a consequence of the operable unit strategy.

OPERABLE UNIT 1: WASTE STORAGE UNITS

Operable Unit 1 was established around the concept of source control for those facilities utilized for the storage/disposal of radiological and (to a lesser extent) chemical wastes from FMPC operations. Related facilities that now contain similar waste types are included. The intent was to recognize the waste units as source terms and to deal with stabilizing, isolating, or treating the waste and any associated cover

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materials so as to prevent the continuing or future release and migration of contaminants to the environment. Based on this intent, the following facilities are included in Operable Unit 1:

- Pits 1, 2, 3, 4, and 6
- Pit 5
- Burn Pit
- Clearwell

Areas surrounding these facilities may become part of a remedial action either directly (e.g., use as a staging area) or indirectly (e.g., a slurry wall may contain the entire area), but are not to be considered as part of the operable unit in terms of direct remediation since this would likely introduce a different series of remedial action alternatives. The exception would be if a given area (e.g., the berms) requires remediation and it becomes more efficient to include this action within the overall source control action.

Both the soils and the perched ground water in the waste storage area are best addressed under Operable Unit 3 along with similar media in the Production Area. In both cases, the media are within a controlled access area and the clean-up requirements will likely differ from those addressed in Operable Unit 5 for regional, uncontrolled areas.

The soils and ground water immediately underlying the waste storage units would, under this scenario, be better addressed under Operable Unit 3 as a threat of continuing or future releases to the underlying aquifer even if the source term (i.e., the waste unit) is eliminated. However, depending on the type of action being addressed and the physical setting involved, these media could be addressed under Operable Unit 1. For example, shallow contaminated ground water that lies adjacent to or immediately beneath a pit would likely be handled as part of a pit remedial action. Water control during remediation may also require collection and treatment of this water. On the other hand, a deeper lens may be better addressed by a separate, localized pumping action similar to those planned for the Production Area. A large perched zone would also be dealt with as a ground water remedial action within Operable Unit 3.

It is important to note that the data base from immediately below the pits may not be sufficient to completely resolve this issue. The remedial action may simply have to allow for the field determination of 'how deep to go' as the remediation proceeds. A final determination on such issues must at least await the compilation and analysis of all current and future data from the waste storage area.

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OPERABLE UNIT 2: SOLID WASTE UNITS

The concept for Operable Unit 2 is very similar to that just described for Operable Unit 1 in that solid waste materials that represent a potential source of contamination to the environment are being addressed. The principal difference in this case has its basis in an allowance by the U.S. EPA that special types of facilities are exempted from the SARA-based preference for remedial actions that reduce the toxicity, volume, or mobility of wastes. One type of exempted facility is a landfill involving a large volume of wastes but only a small percentage of hazardous chemicals. (A sanitary landfill in which small amounts of industrial wastes were disposed is a typical example.) At the FMPC, the following units were considered to fall into this category and are included in Operable Unit 2:

- North and South Lime Sludge Ponds
- Active Flyash Pile
- Abandoned Flyash Pile and Southfield Area
- Sanitary Landfill

It is expected that the remedial action alternatives for these units will involve more straightforward and widely practiced technologies compared to those associated with Operable Unit 1. Nonremoval actions are also more likely in this case. In the event that a solid waste unit is found to represent a major release point to ground water, the individual unit could be realigned with another operable unit to better account for the ground water issues and remedies.

OPERABLE UNIT 3: FACILITIES AND SUSPECT AREAS

The original intent of Operable Unit 3 was to include those facilities and suspect areas that would involve localized clean-up actions using straightforward technologies. Such actions would not influence the remedial action decision process at other operable units, and could involve relaxed clean-up criteria pending future decontamination and decommissioning activities.

Two recent events have both clarified and expanded the basis for Operable Unit 3. First, the introduction of removal actions into the remedial action process for the Production Area has brought into focus the types of problems and remedies being considered under Operable Unit 3. It is possible that Operable Unit 3 will eventually be limited to a series of removal actions rather than a formal Record of Decision process. Second, the initiation of FMPC strategies to deal with perched ground water contamination within the Production Area represents a formalization of the Operable Unit 3 process. That is, once a localized problem is found, the site-specific conditions are to be quickly addressed and an appropriate action is to be implemented through the removal action (and possibly EE/CA) process.

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These considerations are also what led to a recent decision by the RI/FS team to incorporate the overall soil and perched ground water problems within controlled site areas into Operable Unit 3. There appears to be no difference in the types of problems being addressed and the types of decision strategies to be formulated when compared to the current activities for the Production Area. Any contaminated soil or perched ground water conditions associated with suspect areas outside of the Production Area have always been considered to be part of Operable Unit 3 if the remedy is straightforward and limited to that specific area.

Specific areas within the Production Area will be identified as the facilities testing program proceeds. The following is a listing of the suspect areas currently being considered under Operable Unit 3:

- Fire Training Area
- Incinerator Area (East of the Production Area)
- Area near the Flag Pole
- K-65 Slurry Line Trench
- Plant 1 Shot Blaster Area
- Plant 6 Sump (South End of Building)
- Oil Burner Area
- Graphite Burner Area
- PCB Transformer Storage Area
- Several Rubble Mounds outside of Production Area
- Area southeast of Laboratory
- Former Drum Storage Area behind Laboratory
- Area southwest of Pilot Plant Warehouse
- Area near the Proposed D&D Building (RI complete)
- Trench adjacent to the Proposed D&D Building (RI complete)

The metal scrap piles have been deleted from Operable Unit 3 since they are already being dealt with under a separate WMCO project. The Southfield Area has been transferred to Operable Unit 2 since it is directly related to the inactive flyash pile and essentially represents a solid waste unit. As a result, the RI for the Southfield Area has become a critical scheduling factor.

OPERABLE UNIT 4: SPECIAL FACILITIES

Operable Unit 4 has been established to include those facilities that represent unique technical problems and will likely involve specialized technologies. Once the thorium inventory had been removed from this operable unit due to its separate consideration by WMCO, only the K-65 silos (Silos 1 and 2) and the metal oxides silo (Silo 3) remained for consideration.

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The recent discovery of contaminated water in the bottom of Silo 4 does not warrant the inclusion of this silo into the RI/FS process. The silo has never been used as a waste storage facility. The current understanding is that the water entered the silo as precipitation leakage through cracks in the dome roof; this water can be removed and handled through routine WMCO operations. To insert Silo 4 into the Operable Unit 4 RI/FS would: 1) represent an overstatement of the problem; 2) require the introduction of a mutually exclusive series of remedial action alternatives; and 3) mix a precipitation-based problem in with a waste source control problem. In short, the fact that the structure is a silo should not force a change in the decision criteria that initially established the components of Operable Unit 4 -- that is, that the units represent singular types of problems that will involve singular types of solutions.

Silo 4 will require consideration in the Operable Unit 4 FS since some alternatives require the removal or alteration of the silo for implementation. In this case, it should be assumed that the contaminated water inside the silo will have already been remedied. The cost of silo removal or alteration should, however, be accounted for in the FS since this activity would not necessarily have taken place otherwise. WMCO's standard procedures for building decontamination, dismantling, and debris disposal should be applied.

The presence of other suspect areas (e.g., rubble mounds) in the immediate vicinity of Operable Unit 4 should not influence the scope of the Operable Unit 4 work. The baseline condition for the Operable Unit 4 FS should assume that any such areas will be appropriately addressed and remedied under a separate operable unit or project.

OPERABLE UNIT 5: ENVIRONMENTAL MEDIA

Operable Unit 5 includes those environmental media that represent pathways and/or environmental receptors presently or potentially affected by FMPC contaminants. The remedial action decision process for this operable unit will likely center on contaminant-specific ARARs in terms of clean-up levels. Once set, the extent of the action will be defined and the type of action will likely be straightforward.

The Operable Unit 5 media are linked to the 'source control' operable units, but in and of themselves do not represent sources. It is for this reason that contaminated soils and perched ground water, which represent potential sources to the regional environment, are addressed in other operable units. Each of the environmental media are discussed separately below:

Soils: Includes all surface soils not specifically accounted for in other operable

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units. Surface soils would include those soils within the surficial zone of sampling under the Surface Soils Sampling Plan. This zone could go deeper if the sampling program showed increasing concentrations in the deepest sample. Contamination of deeper soils (i.e., subsurface soils) is unexpected except beneath the source units being studied under separate operable units.

Ground Water: Limited to the Great Miami Aquifer throughout the study area, with the exception of the south plume area (Operable Unit 6). Would require consideration of source terms, including perched ground water, but the latter are not an integral component of Operable Unit 5.

Great Miami River Since surface water itself cannot be remediated, this component will address the sediments in the Great Miami River and their role as a potential source of contaminants to the overlying water column and the aquatic community. Continuing sources of contaminants to the Great Miami River are the subject of other operable units or programs; assumptions as to future loading conditions will be required to complete the evaluation of the Great Miami River.

Paddy's Run: Similar to the Great Miami River, with the additional consideration of the effects of leakage from Paddy's Run into the regional aquifer.

Stormwater Outfall Ditch: Similar to Paddy's Run.

Flora and Fauna: Involves the evaluation of the overall flora and fauna in the regional area, including locally grown crops and cattle grazing on FMPC property. The evaluation of the aquatic community must be integrated into the analysis of the respective surface water courses due to the direct relationship with surface water and sediment quality. A similar situation occurs for terrestrial organisms and flora due to the relationship with concentrations of contaminants in soil and irrigation water.

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Ambient Air: The current intent is to eliminate ambient air from the RI/FS. To accomplish this, it will have to be demonstrated that the air pathway does not currently represent an unacceptable dose/health risk and that appropriate source controls will eliminate any potential for future exposures exceeding acceptable levels. The former will be argued on the basis of the CDC study, while the latter will be presented in terms of the NESHAPS program and the ongoing air pollution control projects. Note, however, that impacts on air quality associated with remedial actions for other operable units will still be evaluated as part of the FS for other operable units.

OPERABLE UNIT 6: SOUTH PLUME

The introduction of the south plume as a separate operable unit was originally triggered by the U.S. EPA due to the off-site ground water plume. However, during the progress of the RI/FS for this unit, Operable Unit 6 team expanded the study area for analytical convenience to include all areas of the Great Miami Aquifer south of the ground water divide (i.e., the region of southerly flow).

The recent completion of the EE/CA for the south plume removal action has confused this issue once again. The reason is that the proposed removal action is comprehensive enough that, in and of itself, it satisfies the U.S. EPA's original intent for Operable Unit 6 to a large extent. This intent could be fully satisfied with little additional effort if Operable Unit 6 was again limited to the 'historical' plume that is off site. However, as discovered by the Operable Unit 6 team, any attempt to segregate the south plume area from the 'regional picture' becomes problematical due to the links to the high concentration area near the flyash piles/southfield area, the related continuing releases from the site, and Paddys Run.

The recommendation at this time is to eliminate Operable Unit 6 from the CERCLA ROD process through an expansion of the south plume removal action. All remaining issues would be dealt with under Operable Unit 5. Under this management strategy, Operable Unit 6 would simply be considered as 'a piece of Operable Unit 5' that was pulled out to address, on an accelerated basis through a removal action, an unacceptable off-site condition caused by historic releases. This strategy would allow the Operable Unit 6 team to focus their attention on the 'big picture' of Operable Unit 5 and would eliminate all the existing problems with lack of data and unachievable schedules.

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This recommendation will be more fully developed in the coming weeks. The revised FS Work Plan, due at the end of this month, will provide the formal mechanism for proposing any such changes in management strategy.

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