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PUBLIC PARTICIPATION AT FERNALD: FERMCO'S EVOLVING ROLE

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ABSTRACT

The Fernald Environmental Management Project (FEMP) is a DOE facility near Fernald, Ohio, which operated from 1952 to 1989 to support United States defense programs. The FEMP occupies about 1050 acres, and is located about 18 miles northwest of downtown Cincinnati. The primary mission of the FEMP was to process, refine, and machine high-grade natural uranium ores into high-purity uranium metal. The storage and disposal of large quantities of wastes at the site and the potential for impacting human health led to the site being placed on the National Priorities (Superfund) List. Over 3 million cubic yards of contaminated material and a significant plume of uranium-contaminated groundwater must be managed at Fernald.

In an effort to improve public involvement in the site restoration decision making process, the DOE has established site specific advisory boards, of which the Fernald Citizens Task Force is one. The Fernald Task Force is focused on making recommendations in four areas: (1) What should be the future use of the site? (2) Determinations of cleanup levels (how clean is clean?) (3) Where should the wastes be disposed of? (4) What should be the cleanup priorities? Because these questions are being asked very early in the decision-making process, the answers are necessarily qualified, and are based on a combination of preliminary data, assumptions, and professional judgement. The requirement to make progress in the absence of accurate data has necessitated FERMCO and the Task Force to employ an approach similar to sensitivity analysis, in which a range of possible data values are evaluated and the relative importance of the various factors is assessed.

Because of its charter to provide recommendations of future site use, the Task Force has developed a sitewide perspective, compared to the more common operable unit specific focus of public participation under CERCLA. The sitewide focus and accelerated schedule for public involvement have resulted in the exploration of technical project management issues far in advance of their traditional project sequence. Due to the early consideration of key issues, coupled with the sitewide perspective and sensitivity analysis, there has been a rapid progression from the esoteric realm of the CERCLA process to the early identification of the important decisions to be made and their specific consequences.

The relationship between FERMCO and the Task Force is evolving toward one of partnership with DOE in managing the obstacles and hidden opportunities for success. The Task Force likely will continue to participate in the Fernald project long after its initial recommendations have been made. DOE already has made the commitment that the process of public participation will extend into the Remedial Design phase. There is substantial reason for optimism that continuing the Task Force process through the design phase will assist in developing the appropriate balance of cost and engineered protectiveness.

INTRODUCTION

This paper presents observations and preliminary conclusions on the unique and still evolving relationship between the Fernald Citizens Task Force and FERMCO, the U.S. Department of Energy's (DOE's) environmental restoration contractor at Fernald, Ohio. After a brief introduction to the site, specific examples are discussed of how the expanded public participation process at Fernald works and influences decision making.

THE PROJECT SETTING AND BACKGROUND

The Fernald Environmental Management Project (FEMP) is a DOE facility near Fernald, Ohio, which operated from 1952 to 1989 providing uranium metal products to support United States defense programs. In 1989 the mission of the facility was changed to one of environmental restoration. Also in 1989, the facility was placed on the National Priorities List ("Superfund List"). The FEMP is the subject of an Amended Consent Agreement between DOE and the U.S. Environmental Protection Agency (EPA), under authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and a Resource Conservation and Recovery Act (RCRA) Consent Decree from the Ohio Environmental Protection Agency (OEPA).

The FEMP occupies about 1050 acres, and is located about 18 miles northwest of downtown Cincinnati. The primary mission of the FEMP was to process, refine, and machine high-grade natural uranium ores into high-purity uranium metal. The metal was shipped to other DOE or U.S. Department of Defense facilities for use as "feed materials" in the nuclear weapons program. These uranium production activities generated large quantities of waste materials. The storage and disposal of wastes at the site and their potential for impacting human health led to the site being placed on the National Priorities List.

The CERCLA Remedial Investigation/Feasibility Study (RI/FS) process has found that at least 3 million cubic yards of contaminated material must be managed at the site, and that groundwater has been contaminated. The Fernald site is located above the Great Miami Aquifer, a sole source drinking water aquifer. Off-property drinking water wells in the area have been contaminated with uranium.

The CERCLA process has defined five operable units at the Fernald site, each with its own schedule for completion of the RI, FS, and Record of Decision (ROD), per the Amended Consent Agreement. Operable Unit 1 is comprised of the Waste Pit Area, which includes about 700,000 cubic yards of contaminated material, including process wastes. Operable Unit 2 is comprised of a landfill, two surface impoundments, a flyash pile, and two uncontrolled disposal areas. Operable Unit 2 includes about 300,000 cubic yards of contaminated material. Operable Unit 3 is comprised of the above-grade structures at the site, which are about 200 in number and range from large, former ore processing and manufacturing facilities to small outbuildings. Operable Unit 4 is comprised of four waste silos, which contain about 15,000 cubic yards of waste process sludges. Operable Unit 5 is comprised of the site media, which include contaminated groundwater, sediment, and approximately 2 million cubic yards of contaminated soil.

CERCLA AND THE FERNALD CITIZENS TASK FORCE

Under the CERCLA Amended Consent Agreement, the decisions on the cleanup of the five operable units are made individually and sequentially, with each operable unit's ROD following the previous one by a few months. This has necessitated that much of the RI/FS work for all operable units be done concurrently. In order for the individual operable unit studies and decisions to be consistent and protective of human health and the environment, a common set of assumptions regarding the future use of the site was needed. For example, will the cleanup need to be protective of future resident farming families or will people be excluded from the property? In addition to the obvious effects of alternate future site uses on contaminant cleanup levels, there are also impacts on the evaluation of remediation technologies. In-situ containment and certain engineered disposal facilities, to cite two examples, may be incompatible with some desired future land uses.

The CERCLA process provides for public involvement in remedial decision making. Under CERCLA, there are specific time periods set aside for public comment on the remediation plans that have been developed previously. Although all comments are considered, the fact that the comment period comes late in the decision making process limits their range and impact. In an effort to improve public involvement in the decision making process, the DOE has established site specific advisory boards, of which the Fernald Citizens Task Force is one. The Task Force is focused on making recommendations in four areas that are important to remedial decision-making for each operable unit:

1) What should be the future use of the site?
2) Determinations of cleanup levels (how clean is clean?)
3) Where should radioactive and hazardous wastes which are generated as a result of site restoration activities be disposed of?
4) What should be the cleanup priorities?

To be truly effective in assisting the decision-making process, the Task Force must make these recommendations relatively early in the CERCLA process. Therefore, the Fernald Citizens Task Force becomes involved much earlier than in the traditional public comment period under CERCLA, and hence needs to obtain information from DOE and more specifically DOE's contractor, FERMCO, far in advance of the customary public comment period.

FERMCO AND THE FERNALD CITIZENS TASK FORCE

A traditional relationship between the public and a government contractor usually is constrained by relatively formal processes. However, the Department of Energy has directed FERMCO to cooperate fully with the Task Force and that Task Force needs should be given immediate priority. This, combined with the Task Force's broad charter and accelerated schedule, has resulted in a relationship between the public and contractor that is unusually direct and comprehensive in scope.

One of the initial functional departures from the traditional relationship was the need for FERMCO to provide the Task Force with preliminary data, estimates, and conclusions, whereas

in a traditional relationship only final, carefully reviewed information would be released. For example, FERMCO was requested to provide its best guesses at final site cleanup levels and waste material volumes far in advance of our having the data to support definitive calculations. By responding with best, good faith efforts and honestly revealing the inaccuracies and uncertainties associated with the information being supplied, FERMCO has helped the Task Force focus on key site management issues, and equally importantly, gained a significant measure of mutual goodwill and trust.

The next phase of interactions went beyond the exchange of information into an exploration of indirect consequences of seemingly straightforward management decisions. One prominent example is the proposed on-property waste disposal facility. As discussed above, the cleanup of Fernald will result in the need to dispose of large quantities of contaminated materials. One alternative being considered for the less-contaminated fraction of material is construction of an on-site disposal facility. In order to carefully consider this alternative, the Task Force needed to know some basic facts. Why is on-site disposal needed? How large would the facility be? Where would it be located and what would it look like? How long would it be necessary and how long would it last?

Because these questions were being asked very early in the decision-making process, the answers were necessarily qualified, and were based on a combination of preliminary data, assumptions, and professional judgment. A good example is the question of the size of the potential on-property disposal facility. The size of the facility is a function of the quantity of contaminated material that meets the waste acceptance criteria for the disposal facility and the contaminant cleanup levels for the site. The necessary data normally are obtained through the CERCLA process: data on the nature and extent of contamination are developed through the Remedial Investigation and the cleanup levels are developed through the Feasibility Study and are finalized in the Record of Decision. However, at the time the Task Force needed the information, the relevant Remedial Investigation Reports, although on schedule, were not near completion. Feasibility Study and Record of Decision information was months to years away.

In order to make progress in the absence of accurate data, the Task Force, DOE, and FERMCO adopted an approach similar to sensitivity analysis. In the case of disposal facility size, the possible minimum and maximum sizes (material volumes) as well as the most probable size range were estimated from available data and the key assumptions for each estimate were documented. Naturally, the relatively high uncertainty led to a wide range of volume estimates. This very preliminary range was from 1.5 - 8.5 million cubic yards with a most probable volume of about 2.5 million cubic yards. The critical variable was found to be the cleanup levels (and hence volume) for the Operable Unit 5 soils in potentially contaminated, off-property locations.

The early estimation of a range of contaminated material volumes for potential on-property disposal enabled an evaluation of the required site area that would be dedicated for the facility within the context of the site's future use. The relative site space requirements or "footprints" for disposal facilities of 2.5 million and 8.5 million cubic yards are shown in Figure 1.

INSERT FIGURE 1 HERE

The Task Force's consideration of possible disposal facility locations at Fernald was interesting and indicative of the technical planning issues on complex remediation projects. One of the insights gained from the earliest Task Force activities, especially through the use of the *FutureSite* exercise (Applegate 1995), was that the public, and in particular those persons living near the site, were especially concerned about project activities and future site use commitments that would occur near the site borders, compared to the interior of the site.

Concern about the relatively undisturbed border areas of the site led to the initial and informal public perspective that the preferred location for a potential disposal facility would be in the central area of the site. Given that a substantial portion of the property's interior already had been developed as the former process area, this location was suggested to FERMCO as an area that should be carefully evaluated for the disposal site location.

Clearly, a suitable hydrogeologic setting is essential for locating a disposal facility, and Ohio EPA has set appropriate technical requirements. However, if a large enough area of suitable hydrogeology were available, then DOE and FERMCO would have some flexibility in selecting the specific footprint to accommodate the preferences of the public. Regardless of hydrogeological conditions, other important factors associated with different potential locations could be evaluated.

Two of the potential locations for a typical 2.5 million cubic yard disposal facility are shown in Figure 2. In the figure, Location A covers mostly unused land and is within 300 feet of the eastern property border and Location B is within the former process area, over 1,500 feet from any property border. At the integrated project level (as opposed to the operable unit level) the requirements for the sequencing of activities are very different for the two locations and have very different cost implications. For example, disposal facility construction is not physically constrained at Location A, whereas at Location B disposal facility construction cannot be implemented until the existing buildings are safely shutdown, decontaminated and demolished, and the contaminated foundations and soil beneath and around them are excavated. This would require the interim storage of any building debris to be disposed of on-site, as well as the stockpiling of the contaminated soil from the former process area and other site areas that would be remediated prior to the availability of the disposal facility.

INSERT FIGURE 2 HERE

The cost implications of the differences in project sequencing are significant. Additional costs are required for Location B due to double handling of the building debris; double handling of the process area soils and other site soils; construction of appropriate interim storage facilities for the soil and debris; monitoring and environmental control of the stored, contaminated material; and demolishing and disposing of the interim storage facilities. Given that over one million cubic yards of soil and debris would be stored and double-handled, the additional cost of locating the disposal facility in the central portion of the site would be on the order of $50-100 million. The Task Force will use this information in reaching its recommendations on future land use and waste disposition, which are due in the summer of 1995.

INITIAL CONCLUSIONS

Although the ultimate assessment of the utility of site specific advisory boards is years away, it is possible to draw initial observations and conclusions based on the experience at Fernald. The Fernald Citizens Task Force is providing input from the public to the decision making process far in advance of the traditional public participation process. Because of its charter to provide recommendations of future site use, the Task Force has developed a sitewide perspective, instead of the more common operable unit specific focus of public participation under CERCLA. The sitewide focus and accelerated schedule for public involvement have resulted in the Task Force's exploration of technical project management issues far in advance of the availability of accurate data.

The requirement to make progress in the absence of accurate data has necessitated an approach similar to sensitivity analysis, in which a range of possible data values are evaluated and the relative importance of the various factors is assessed. For example, in predicting the size of a potential on-site disposal facility it was determined that the key factor would be the final cleanup levels for the soils in Operable Unit 5, especially for the off-property areas that are under study.

Another way of looking at this particular case is that the sitewide long-term impacts of different cleanup levels for Operable Unit 5 were made tangible to the public at an early stage, and that FERMCO and DOE project managers obtained highly useful information months ahead of the time it would normally be developed. Similarly, in the case of evaluating different locations for an on-property disposal facility, the public and project planners were able to assess sitewide interactions and interferences far in advance of their traditional sequencing. In both cases, there was rapid progression from the esoteric realm of the CERCLA process to the early identification of the important decisions to be made and their specific consequences.

The Fernald Citizens Task Force is considering many more issues than the few that are discussed here, and to make informed recommendations the Task Force needs site data and cost and schedule information pertinent to each issue. Particularly helpful in this regard has been the use of state-of-the-art Geographical Information System (GIS) and three-dimensional, color imaging software to realistically depict possible future site conditions such as changes in site topography due to excavation of contaminants, or to simulate the appearance of a disposal facility from a public road. To quickly evaluate the cost and schedule impacts of several alternatives, an integrated site master schedule and cost model are essential.

The Task Force, DOE, and FERMCO must continue to be willing and able to develop, qualify, communicate, and accept the limitations of an information base that consists of preliminary data, assumptions, and professional judgment. One problem that has emerged as the result of doing so much, so fast, based on assumptions is that teams working on different specific issues may make different assumptions about the same site condition or assume different technical approaches for similar remediation tasks. These inconsistencies are best identified and corrected through regular integrated project planning meetings that result in a single set of documented management guidance for project personnel.

The relationship between FERMCO and the Task Force is evolving toward one of partnership with DOE in managing the obstacles and hidden opportunities for success. The enhanced public participation through the Fernald Citizens Task Force has led to an accelerated focus on sitewide

technical and management issues and, through a project-level sensitivity analysis, has identified major opportunities to be managed. The Task Force likely will continue to participate in the Fernald project long after its initial recommendations have been made. DOE already has made the commitment that the process of public participation will extend into the Remedial Design phase at Fernald. There is substantial reason for optimism that continuing the Task Force process through the design phase will assist in developing the appropriate balance of cost and engineered protectiveness.

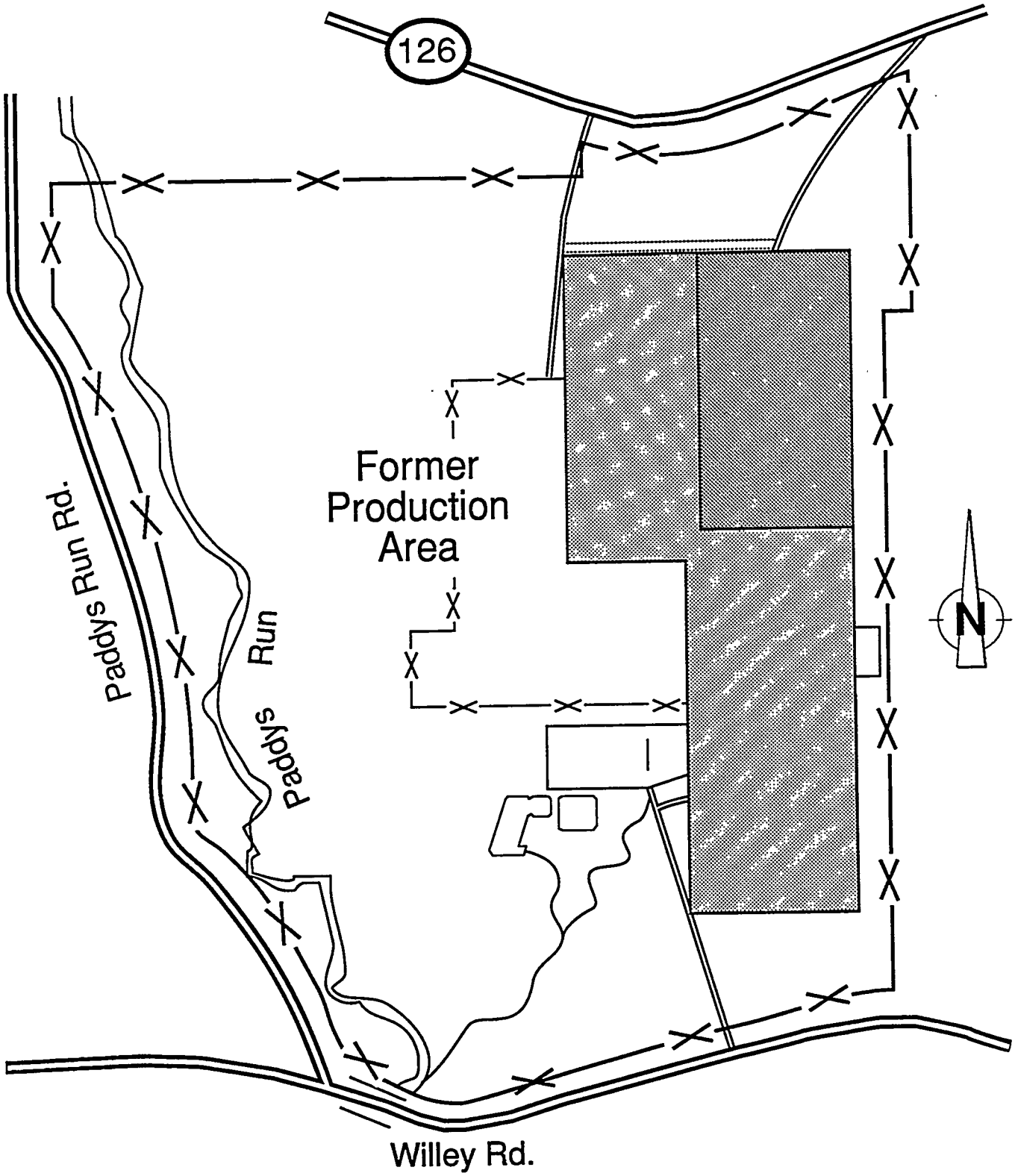

Figure 1. Comparison of "footprint" requirements for conceptual disposal facility of 2.5 million and 8.5 million cubic yards.

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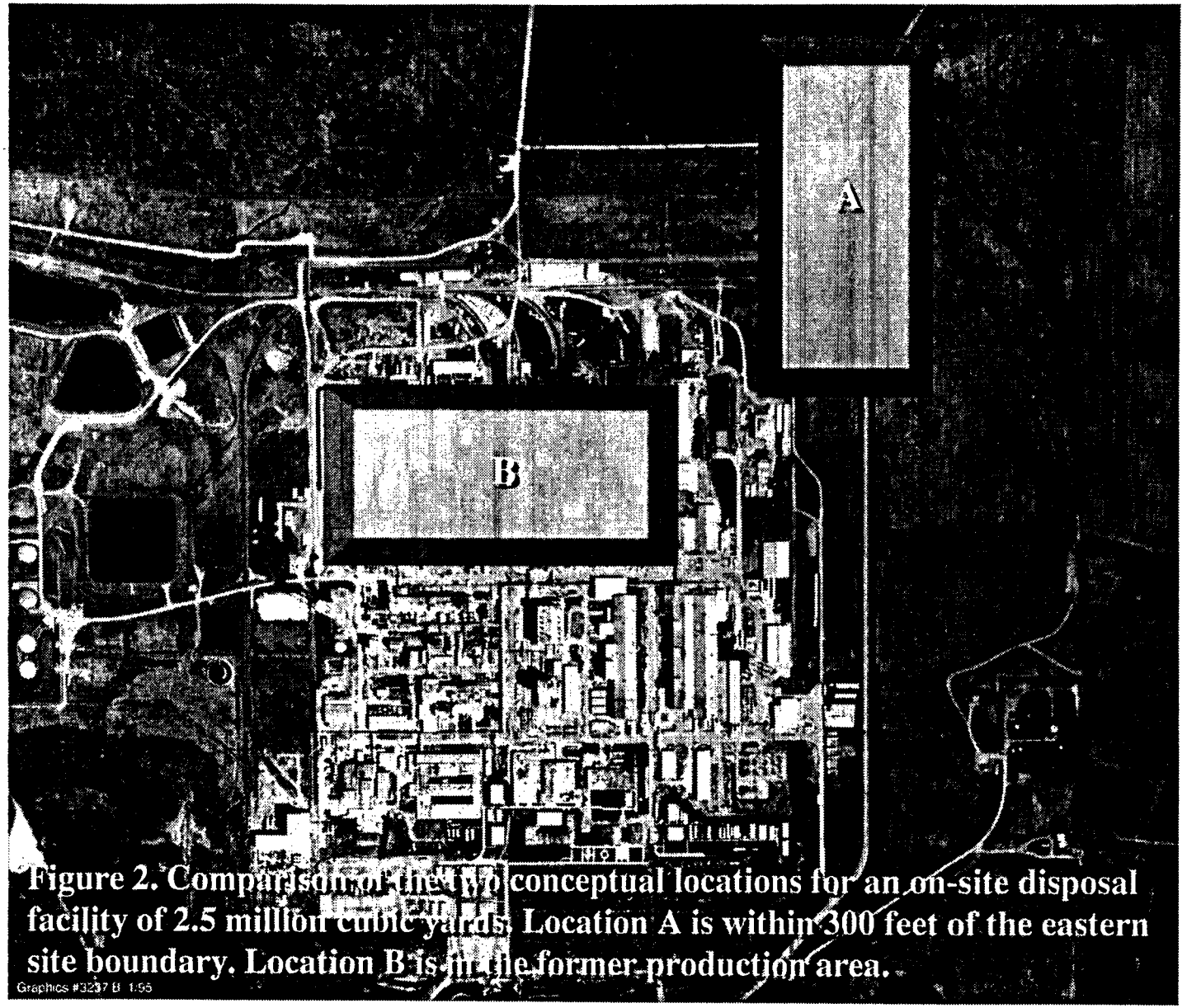

Figure 2. Comparison of the two conceptual locations for an on-site disposal facility of 2.5 million cubic yards. Location A is within 300 feet of the eastern site boundary. Location B is in the former production area.

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