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ACTION DESCRIPTION MEMORANDUM

PROPOSED DECONTAMINATION OF THE ALBANY RESEARCH CENTER, ALBANY, OREGON

by

Energy and Environmental Systems Division

June 1987

work sponsored by

U.S. DEPARTMENT OF ENERGY
Oak Ridge Operations
Technical Services Division
Oak Ridge, Tennessee

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ACTION DESCRIPTION MEMORANDUM

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1 SUMMARY OF PROPOSED ACTION

As part of its Formerly Utilized Sites Remedial Action Program (FUSRAP), the U.S. Department of Energy (DOE) proposes to decontaminate those areas at the Albany Research Center (hereafter referred to as the Albany site), Albany, Oregon, that are radioactively contaminated as a result of programs previously conducted by the U.S. Atomic Energy Commission (AEC). Metallurgical operations on thorium and uranium were conducted intermittently at the Albany site from 1954 to 1978. Various buildings and site surroundings are radioactively contaminated as a result of these activities.

DOE is proposing to decontaminate those areas at the Albany site that are radioactively contaminated above current guidelines. Remedial actions will involve removal of contaminated equipment, decontamination of various buildings, and excavation of contaminated soil material from the "Back Forty" area and a few small areas between and adjacent to various buildings on the site. It is estimated that about 2,300 m^3 (3,000 yd^3) of contaminated material will be generated by these activities (Bechtel Natl. 1986). As part of the proposed action, the radioactive wastes will be transported to the Hanford site near Richland, Washington, for disposal.

The purpose of the remedial actions is to reduce the residual radioactivity to levels below established criteria, thereby allowing the site to be certified and released for unrestricted use. Decontamination and restoration activities will be carried out in compliance with all applicable regulations, and mitigative measures will be employed to reduce environmental impacts to low levels. Environmental monitoring will be conducted during remedial actions to ensure compliance with all applicable requirements. Analysis of potential environmental impacts indicates that these remedial actions will have no significant impact on the environment.

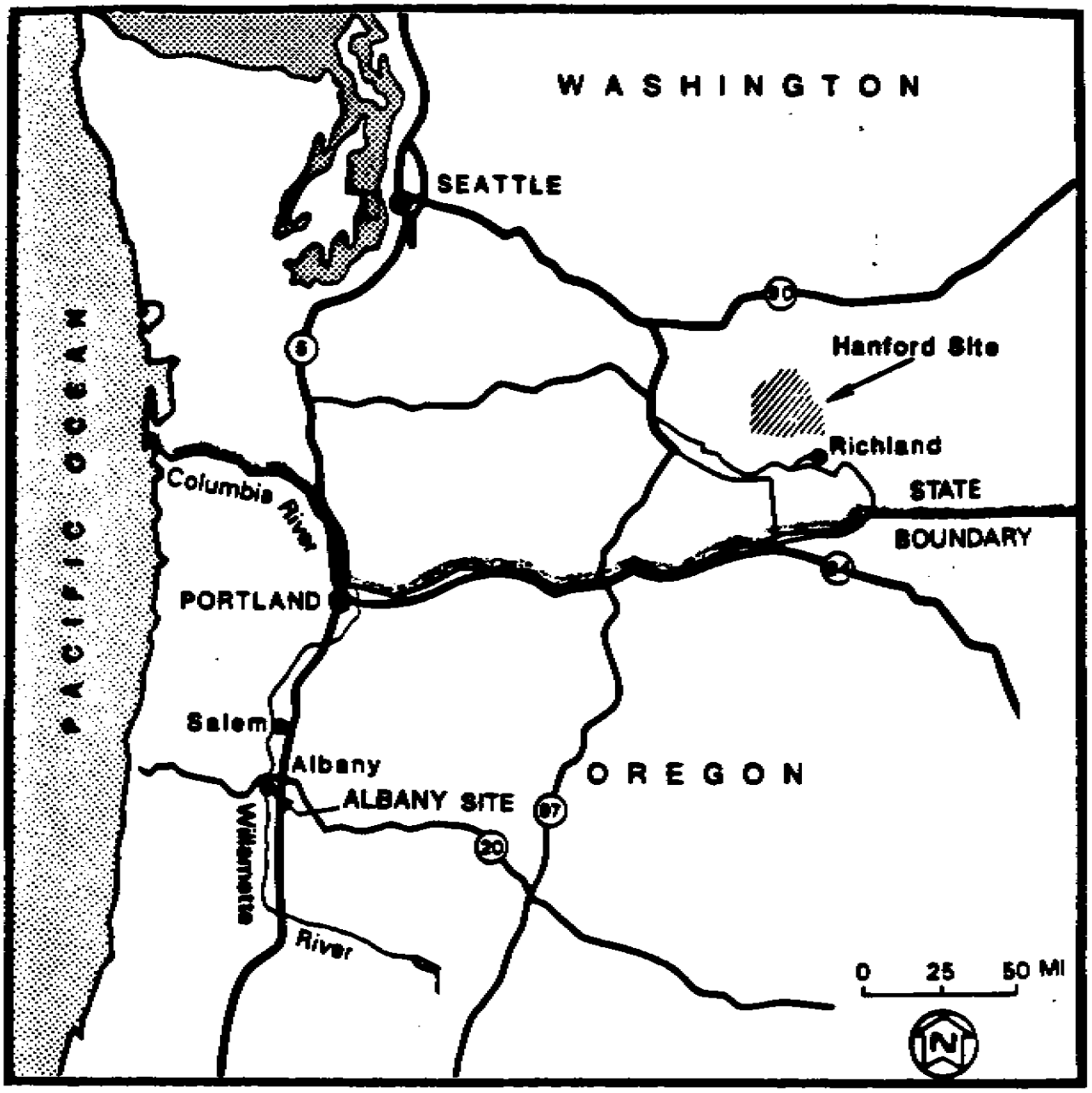

FIGURE 2.1 Location of the Albany Site (Source: Modified from Bechtel Natl. 1985a and U.S. Dept. Energy 1987)

that the Albany site was contaminated above current guidelines. An aerial radiological survey conducted in February 1980 did not indicate the presence of radioactive contamination in excess of background levels (Feimster 1981); however, an aerial survey is not able to detect buried radioactive material. As a result of these radiological investigations, a subsequent radiological survey was conducted in 1984 to more thoroughly delineate the extent of radioactive contamination (Bechtel Natl. 1985b). This survey confirmed the results of the ANL surveys that portions of the site are radioactively contaminated in excess of current guidelines.

2.3 PROPOSED ACTION

DOE is proposing to decontaminate those areas of the Albany site that are contaminated above current DOE guidelines to allow the site to be released for unrestricted use. Remedial action activities at the site will include both the excavation of contaminated soil material (principally from the "Back Forty" area), removal of contaminated equipment, and decontamination of various buildings. All the collected wastes, an estimated 2,300 m^3 (3,000 yd^3), will be transported by truck to the 200-West Area of the Hanford site near Richland, Washington, for disposal at the DOE waste-disposal facility. The distance from the Albany site to the Hanford site is about 560 km (350 mi) (Bechtel Natl. 1985a).

Standard techniques will be utilized to decontaminate the buildings. For example, water or special cleaners may be used to flush drainage systems and pipes; these solutions will remove the contamination but leave the surface material essentially intact. The resulting contaminated water will be collected and managed along with contaminated water generated by other site activities. Vacuum cleaners may be used to clean ducts and the exteriors of various components and floors. Dust will be controlled by either filtering the exhaust or using a wet vacuum process. In situations where the radioactivity is imbedded in the material (e.g., contaminated concrete), the contaminated material will be removed by grinding, scabbling, etc., as appropriate. If necessary, entire components may be removed as radioactive waste. The wastes will be packaged in plastic bags to control the spread of radioactive contamination and possibly placed in wooden boxes for ease of handling. Following decontamination, the buildings and facilities will be restored as appropriate.

Contaminated soil material will be excavated using standard construction procedures and then either temporarily stockpiled or directly loaded onto trucks for transport to the Hanford site. The depth of contamination is generally about 0.15 m (0.5 ft) below the ground surface, with a few areas extending to a depth of up to 0.6 m (2 ft). The areal extent of contamination is approximately 1 ha (2.5 acres) in about 25 distinct locations across the site. It may be necessary to stockpile the soil material for a short period of time for moisture conditioning or in order to generate a sufficient quantity to expedite the loading of trucks. Dust will be controlled by maintaining the material in a damp condition. Because excavation depths are not expected to exceed 0.6 m (2 ft), groundwater should not be encountered and, therefore, a dewatering system will not be necessary. If any groundwater is encountered during excavation, the water will be managed in the same manner as other potentially contaminated water generated by other site activities. The decontaminated areas will be backfilled with clean material and seeded.

The wastes will be transported in trucks in a manner that minimizes the potential loss of contaminated material during shipment. For example, the bulk wastes will be enclosed in a plastic liner that can be sealed during transport. Additionally, the trucks will have gasketed tailgates, will contain material to absorb any free water generated during shipment, and will be covered with tarps during the transport of contaminated material to the Hanford site and during the return of empty trucks to the Albany site. Only a minimal amount of material is expected to be released to the environment during transportation.

3 AFFECTED ENVIRONMENT

3.1 RADIOLOGICAL CONDITIONS

The Albany site is contaminated with radionuclides of the thorium-232 and uranium-238 decay series (Figs. 3.1 and 3.2). The major radioactive contaminants in the wastes are thorium-232 and its radioactive decay products. Based on previous radiological surveys (Argonne Natl. Lab. 1983a, 1983b; Bechtel Natl. 1985b), no definitive conclusions can be drawn relative to the degree of equilibrium that the various decay products have with the parent radionuclides, uranium-238 and thorium-232. In some samples from these surveys, the concentration of radium-226 exceeded that of its parent uranium-238, whereas in other samples the reverse was found. However, based on an analysis of the available data, the radioactive constituents in the wastes can be approximated as containing thorium-232 at a concentration of 70 pCi/g in equilibrium with all of its decay products and uranium-238 at a concentration of 20 pCi/g in equilibrium with all of its decay products.

The volume of radioactive wastes resulting from remedial action activities at the Albany site is estimated to be 2,300 m^3 (3,000 yd^3), of which 2,000 m^3 (2,600 yd^3) is soil material and 300 m^3 (400 yd^3) is contaminated equipment, hardware, and concrete. The estimated volumes and average concentrations of radionuclides associated with decontamination of the site are summarized in Table 3.1. The soil contamination is confined to the upper 0.6 m (2 ft) in very distinct locations. Because the principal contaminant is thorium, which is very immobile, the contamination has remained in approximately the same areas in which it was initially deposited. Surveys of nearby areas have not identified any off-site locations that are contaminated in excess of current criteria (App. A). The results of analyses of on-site and off-site groundwater and surface water samples indicate that there is no radioactive contamination in excess of (or even approaching) DOE limits for water.

3.2 CHEMICAL CONDITIONS

Samples of waste materials from various locations at the Albany site have been analyzed for the presence of nonradioactive contaminants. All samples were analyzed for the hazardous waste characteristics specified in the Resource Conservation and Recovery Act (RCRA), as defined in 40 CFR Parts 261.21 through 261.24 — i.e., ignitability, corrosivity, reactivity, and EP toxicity. The results indicate that the waste materials do not exhibit any of the four RCRA hazardous waste characteristics. Samples from the trenches and from sumps in the process buildings were also analyzed for base-neutral-extractable and acid-extractable organic compounds and for metals. Some samples had low concentrations (above detection limits) of several of these organic compounds, and the concentrations of some metals were slightly elevated relative to background concentrations in soil. However, these results do not indicate the presence of significant concentrations of chemical contaminants that would affect the handling or disposal of the wastes (Kannard 1987).

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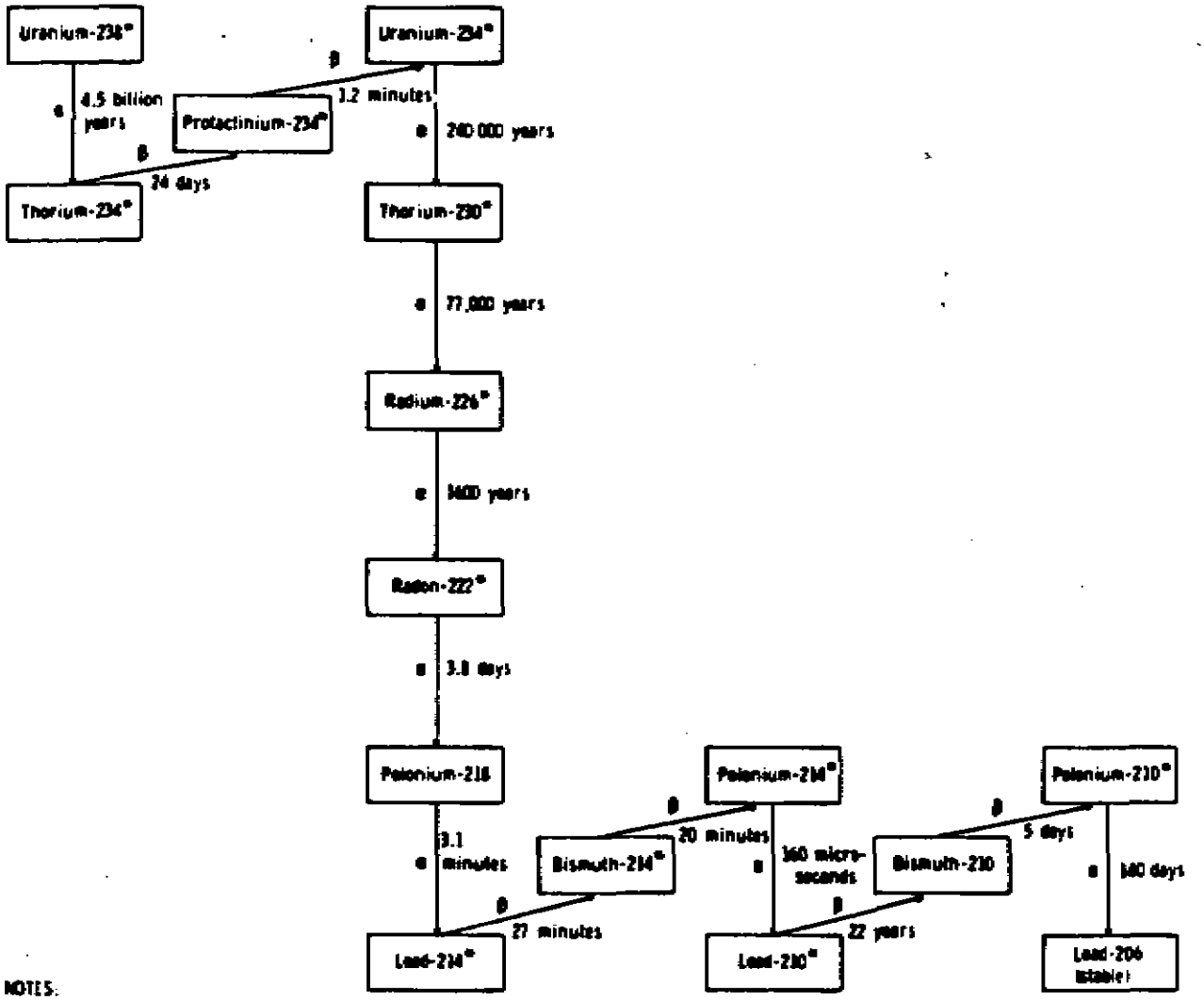

NOTES:

Only the dominant decay mode is shown.
The times shown are half-lives.
The symbols α and β indicate alpha and beta decay.
An asterisk indicates that the isotope is also a gamma emitter.

FIGURE 3.2 Uranium-238 Radioactive Decay Series

The geologic units in the Albany area consist of consolidated rocks and unconsolidated deposits (Beaulieu et al. 1974; Frank 1974). The principal bedrock units include Siletz River Volcanics; marine Tyee, Spencer, and Eugene formations (fine-grained sandstone, siltstone, and shale); intrusive igneous rocks; and Little Butte Volcanic Series. Consolidated rocks in the upland parts of the Albany area yield small quantities of water to wells, but such rocks at depth beneath the valley fill generally have low permeabilities and therefore do not readily transmit water to wells (Tsai and Smith 1983).

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3.4 HYDROLOGY

The Albany area is drained primarily by the Willamette and Calapooia rivers (Fig. 3.3). The Willamette River, which is the major stream, generally flows northward and then turns eastward in the Albany area. The Calapooia River, which provides much of the local drainage for the Albany site, flows into the Willamette River north of the site. Oak Creek, which is located south of the Albany site and flows into the Calapooia River, also provides site drainage. The Albany Santiam Canal is about 1 km (0.6 mi) east of the Albany site area. The water surface elevation in the canal is about 70 m (230 ft) MSL (Tsai and Smith 1983).

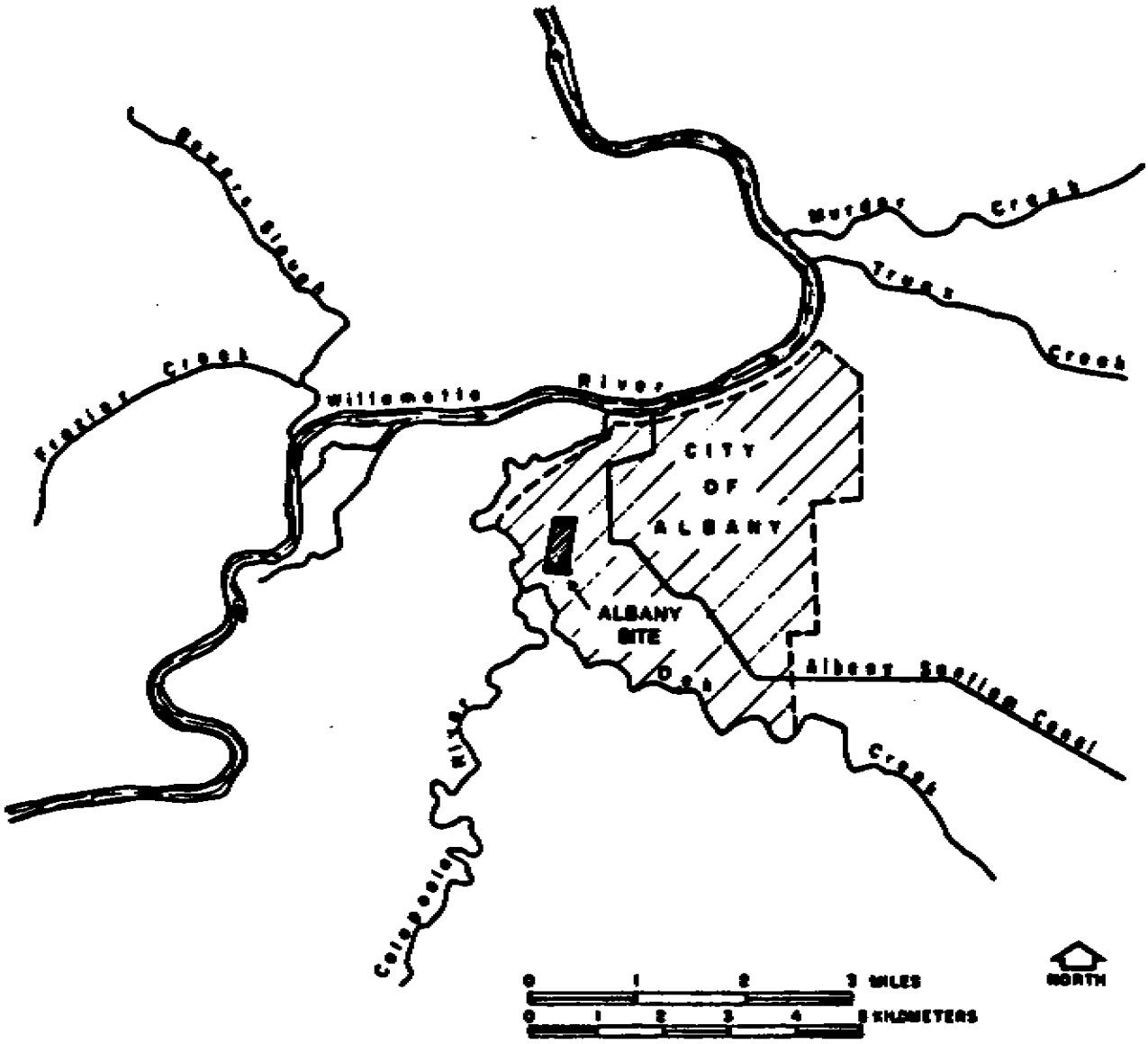

FIGURE 3.3 Surface Water Hydrology in the Vicinity of the Albany Site (Source: Modified from Tsai and Smith 1983)

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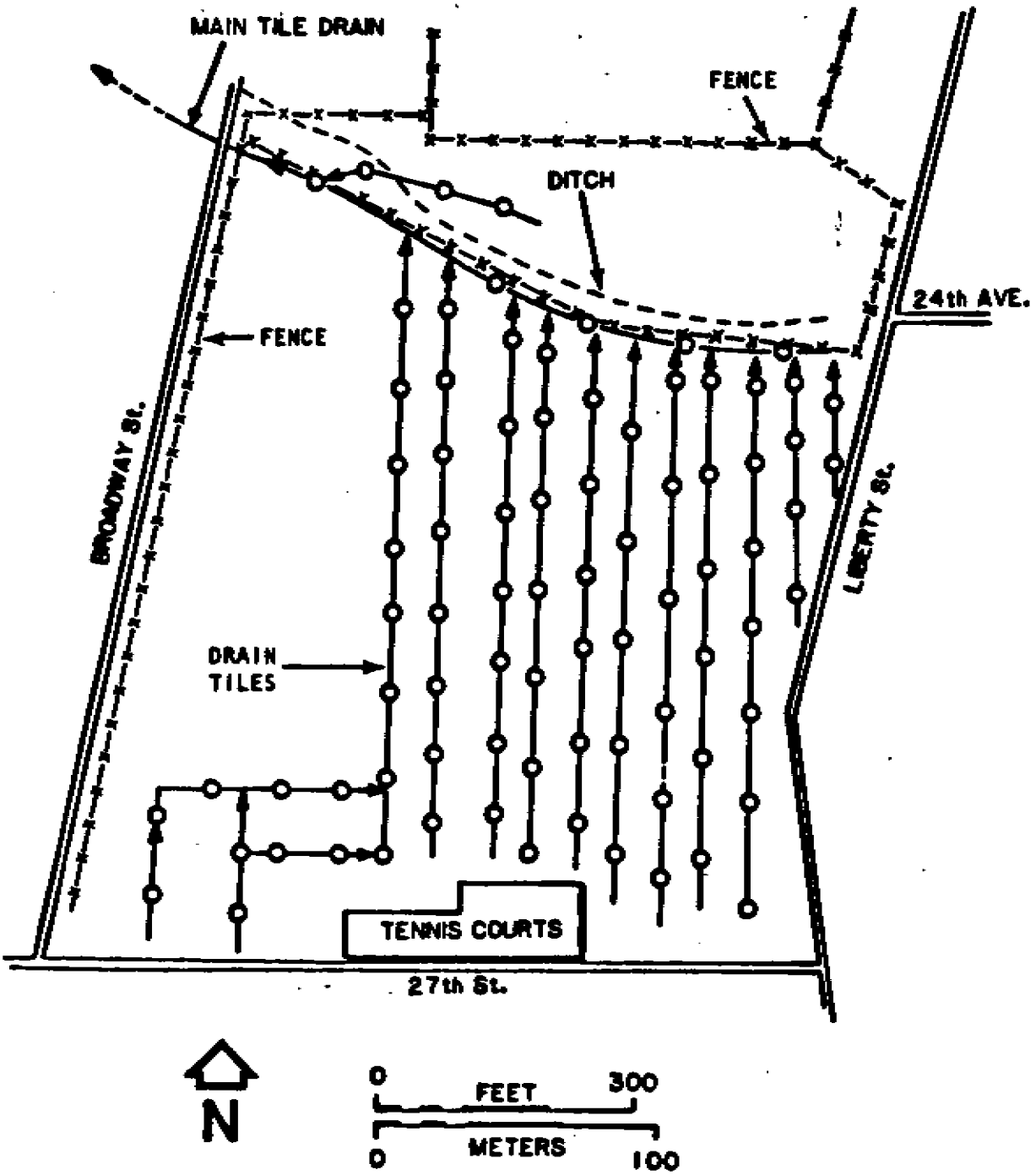

FIGURE 3.4 Location of Drain Tiles in the "Back Forty" Area of the Albany Site (Source: Modified from Tsai and Smith 1983)

3.7 SOCIOECONOMICS AND LAND USE

The Albany site is located in the western portion of the city of Albany, which is the county seat of Linn County. According to population and employment statistics (Ore. Econ. Dev. Dept. 1983), the 1981 populations of Albany and Linn County were 27,000 and 90,500, respectively. This represents a 48.2% increase over the 1970 population for the city of Albany and a 25.8% increase for Linn County.

The three main industries in the county are agriculture, forestry, and rare metals. The primary agriculture/forestry products include grain, hay, silage, grass and legume seed, peppermint, dill, sugarbeet, vegetables, berries, fruits, nuts, wood and paper products, and Christmas trees.

The county's civilian labor force in 1986 was 41,340, of which 37,100 people were employed; the unemployment rate was 10.2% (Ore. Dept. Human Resour. 1986). Manufacturing firms employed about two-fifths of the labor force and nonmanufacturing about three-fifths. The primary manufacturing firms are Teledyne Wah Chang, employing about 1,500 and producing rare metals; and Willamette Industries, employing about 850 and producing wood and paper products. Primary nonmanufacturing employers include the Greater Albany Public Schools, employing about 900, and the Linn County government, employing about 500. About 160 people are employed at the Albany site.

The area around the Albany site is primarily urban residential. Single- and multiple-family residences occur to the north; a large school complex occurs to the east; single-family residences and pastureland occur to the west; and residences and a tennis club occur to the south. Both Albany and Linn County have adopted 20-yr comprehensive land-use plans that serve as the legal basis for land-use decisions, and both have active planning commissions. The entire area around and including the Albany site is zoned as single- or multiple-family residential, but some sites such as the Albany site and the school complex are designated as public facilities.

An adequate supply of houses is available in Albany, and most houses (with lot) are valued in the range of $45,000 to $65,000. Rental housing is also available, with a vacancy rate of about 7%. The property tax assessment ratio is a combined rate of $22.34 per $1,000 assessed value.

The Albany site has no historic or prehistoric sites that are listed with the State Historic Preservation Office (Gilson 1987). Prehistoric mounds in this area generally exist only in areas of undisturbed riparian vegetation along the river terraces. Several such sites exist along the Calapooia River (Pettigrew 1987), but any that may have occurred on the Albany site would have already been destroyed by land-use activities prior to or during site operations.

3.8 TRANSPORTATION ROUTE

According to the proposed action, the radioactive wastes at the Albany site will be transported by truck to the Hanford site near Richland, Washington. DOE currently operates a waste-disposal facility for low-level radioactive wastes at the Hanford site.

4 ENVIRONMENTAL CONSEQUENCES AND MITIGATION

4.1 RADIOLOGICAL IMPACTS

4.1.1 Estimated Impacts

Implementation of the proposed action would result in workers being exposed to elevated levels of radiation and incurring relatively small radiation doses compared with allowable occupational dose limits. Doses to members of the general public resulting from the remedial action activities would be very small compared with the dose incurred from background sources of radiation. The predominant pathways by which radionuclides could reach nearby workers and members of the general public during the proposed action are (1) internal dose from inhalation of radioactive gases (radon-220 and radon-222) and their decay products, (2) internal dose from inhalation of contaminated dust particles, (3) external dose from exposure to airborne radioactivity, and (4) external dose from radioactive material on the ground. This analysis indicates that inhalation of radioactive gases and particulates would contribute more than 95% of the dose to the general public. Based on analysis of similar activities (Argonne Natl. Lab. 1982), it is expected that the internal dose from ingesting contaminated food or water would be insignificant.

The analysis of potential doses to nearby individuals and to the general public in the vicinity of the Albany site is based on the following:

- Radionuclides in each of the two separate decay series (Figs. 3.1 and 3.2) are assumed to be present in equilibrium with the parents thorium-232 and uranium-238.

- The average concentrations of radionuclides in the contaminated material are 70 pCi/g for each radionuclide in the thorium-232 decay series and 20 pCi/g for each radionuclide in the uranium-238 decay series.

- The density of the contaminated material is assumed to be 1.5 g/cm^3.

- The duration of the activities involving cleanup of contaminated areas and transport to the disposal facility will be a total of 4 mo.

- Based on information given a report of the U.S. Environmental Protection Agency (1977), it is estimated that the amount of dispersible particulate releases from excavation activities is 0.001% of the material to be removed. This release fraction is also used for equipment and building decontamination activities.

TABLE 4.1 Estimated Doses to Nearby Individuals in the Vicinity of the Albany Site Resulting from Remedial Actions

Individual/Location	Distance and Direction from Activities	Effective Dose Equivalent (mrem)[a]	
		Particulates	Radon Gas
Resident on Queen Avenue	0.41 km N	0.0046	0.023
Student at Union High School	0.40 km NE	0.00015	0.0011
Student at Liberty School	0.22 km SE	0.00088	0.0048
Resident on Liberty Street	0.37 km S	0.0018	0.015
Resident on Broadway Street	0.15 km W	0.025	0.13

[a]These doses are those associated with radioactive releases during the remedial actions and do not include those incurred from background sources.

TABLE 4.2 Estimated Doses to the General Public in the Vicinity of the Albany Site Resulting from Remedial Actions

Source of Dose	Effective Dose Equivalent (person-rem)[a]
Remedial action activities	0.023
Background radiation during the same time period	30,000[b]

[a]Reported as the 100-yr environmental dose commitment to the general public within 80 km (50 mi) of the Albany site.

[b]Includes dose from external radiation exposure and radon gas.

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these wastes is below that considered radioactive for transportation purposes by the U.S. Department of Transportation, i.e., the concentration of radionuclides in these wastes is less than 2,000 pCi/g [49 CFR Part 173.403(y)]. However, the trucks will be designated for hauling radioactive materials only during the lifetime of the project.

The primary mechanism by which truck drivers would incur a radiation dose while transporting the wastes to the Hanford site is external radiation exposure. The external dose rate in the truck cab is estimated to be about 0.05 mrem/h above background. Based on a distance to the Hanford site of about 560 km (350 mi), the driver would be exposed to the wastes for about 8 h and the dose to the truck driver would be about 0.4 mrem per trip. For the estimated 300 trips required to transport the wastes to the Hanford site, the collective occupational dose commitment for transportation is estimated to be about 120 person-mrem. The total occupational dose commitment is therefore estimated to be between 1 to 2 person-rem for the entire proposed action associated with the Albany site.

The major contaminants at the Albany site are radium and thorium and their decay products. The DOE guidelines for residual radioactive material (App. A) provide soil guidelines for these radionuclides and necessary guidance for any related cleanup activities. DOE believes that these guidelines are sufficiently conservative to adequately protect the public from potential adverse health effects that might occur in the future from any residual radioactive contamination at the site. Although radionuclides are present at the Albany site in addition to thorium and radium and their decay products (e.g., uranium isotopes), measurable concentrations of such contaminants are expected to be present only along with thorium and radium contamination. If this is not the case, authorized limits (as described in App. A) will be developed as necessary. In addition, the site will be decontaminated in a manner to reduce future doses to levels that are "as low as reasonably achievable" (ALARA).

4.1.2 Monitoring and Mitigative Measures

To protect the environment and the health and safety of the general public and site personnel during remedial actions, a site construction environmental monitoring program that meets DOE requirements will be conducted during all phases of this project. Specific measures will also be implemented to prevent the spread of radioactive material and to protect workers and nearby residents from exposure to radiation. A summary of the monitoring and mitigative measures is given in Table 4.4. Post-remedial action radiological measurements will be taken to confirm that the remedial actions have been effective in removing all material that is contaminated in excess of DOE guidelines.

4.2 CHEMICAL IMPACTS

The results of chemical analyses of samples from the Albany site do not indicate the presence of significant concentrations of any chemically hazardous substances. Therefore, very minimal chemical impacts would result from remedial action activities at the site. Proper procedures to protect workers and the general public from the

Water from a local public supply system will be used for equipment decontamination at the Albany site. A high-pressure water system will minimize water use. Contaminated water generated by decontamination activities, as well as that collected from other on-site activities that is excess to on-site needs (i.e., dust control during excavation activities), will be shipped to an off-site commercial facility for treatment and disposal or will be stabilized (i.e., solidified in an appropriate binder) and transported to the Hanford site for disposal. Remedial action activities will be carried out in a manner that minimizes the amount of excess water.

After removal of contaminated soil material, fill activities will require consumption of soil, sand, and/or gravel resources from another site. These resources are generally available locally, and supplies would not be unduly strained by the demands of the proposed action.

4.4 ECOLOGY

Implementation of the proposed action would have only a minimal effect on the terrestrial biota in the project area. Mammals and birds currently inhabiting the properties would be dispossessed (larger and/or mobile species, especially birds) or destroyed (smaller and/or less mobile species, especially rodents). The ground vegetation on the site would be destroyed temporarily, but it would be restored by reseeding with grass and trees native to the area. The adverse effects of dust, noise, and traffic during the decontamination activities would be minimal because of (1) the paucity of wildlife, (2) the location of the site in a suburban/urban area where such impacts currently exist, and (3) implementation of the mitigative measures summarized in Table 4.4. Bird and small mammal populations should return to pre-activity levels within 1 yr because of immigration from surrounding areas and high reproductive rates. No impacts to endangered or threatened biota are anticipated from the proposed action because their habitats do not correspond to those found on the Albany site.

4.5 SOCIOECONOMICS AND LAND USE

No demographic impacts are expected during the proposed action because the work force will be small, local contractors and workers will be used, and the activity period will be brief. There would be no land-use changes to the area surrounding the Albany site as a result of this action.

No impacts to the economy of the local area are expected. There would be some disruption of local traffic by construction truck traffic removing contaminated material or bringing in fill. However, the magnitude of the impact would be mitigated by the relatively small number of truckloads, the relatively short period of remedial actions (about 4 mo), the route selected, and other mitigative measures.

Excavation and fill activities, as well as increased traffic, are expected to increase fugitive dust and noise levels, which might cause a short-term annoyance to local residents. However, fugitive dust and noise impacts should not be significant for this type of remedial action (Argonne Natl. Lab. 1982). In order to minimize this nuisance, there will be periodic checks of mufflers, compressors, etc.; construction

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APPENDIX A

DOE GUIDELINES FOR RESIDUAL RADIOACTIVITY

U.S. DEPARTMENT OF ENERGY GUIDELINES
FOR RESIDUAL RADIOACTIVE MATERIAL AT
FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM
AND
REMOTE SURPLUS FACILITIES MANAGEMENT PROGRAM SITES

(Revision 2, March 1987)

A. INTRODUCTION

This document presents U.S. Department of Energy (DOE) radiological protection guidelines for cleanup of residual radioactive material and management of the resulting wastes and residues. It is applicable to sites identified by the Formerly Utilized Sites Remedial Action Program (FUSRAP) and remote sites identified by the Surplus Facilities Management Program (SFMP).* The topics covered are basic dose limits, guidelines and authorized limits for allowable levels of residual radioactive material, and requirements for control of the radioactive wastes and residues.

Protocols for identification, characterization, and designation of FUSRAP sites for remedial action; for implementation of the remedial action; and for certification of a FUSRAP site for release for unrestricted use are given in a separate document (U.S. Department of Energy 1986) and subsequent guidance. More detailed information on applications of the guidelines presented herein, including procedures for deriving site-specific guidelines for allowable levels of residual radioactive material from basic dose limits, is contained in "A Manual for Implementing Residual Radioactive Material Guidelines" (U.S. Department of Energy 1987), referred to herein as the "supplement".

"Residual radioactive material" is used in these guidelines to describe radioactive material derived from operations or sites over which DOE has authority. Guidelines or guidance to limit the levels of radioactive material and to protect the public and the environment are provided for (1) residual concentrations of radionuclides in soil,** (2) concentrations of airborne

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*A remote SFMP site is one that is excess to DOE programmatic needs and is located outside a major operating DOE research and development or production area.

**"Soil" is defined herein as unconsolidated earth material, including rubble and debris that may be present in earth material.

DOE policy requires that all exposures to radiation be limited to levels that are as low as reasonably achievable (ALARA). For sites to be released for unrestricted use, the intent is to reduce residual radioactive material to levels that are as far below authorized limits as reasonable considering technical, economic, and social factors. At sites where the residual material is not reduced to levels that permit release for unrestricted use, ALARA policy is implemented by establishing controls to reduce exposure to levels that are as low as reasonably achievable. Procedures for implementing ALARA policy are discussed in the supplement. ALARA policies, procedures, and actions shall be documented and filed as a permanent record upon completion of remedial action at a site.

B. BASIC DOSE LIMITS

The basic limit for the annual radiation dose received by an individual member of the general public is 100 mrem/yr. The internal committed effective dose equivalent, as defined in ICRP Publication 26 (ICRP 1977) and calculated by dosimetry models described in ICRP Publication 30 (ICRP 1978), plus the dose from penetrating radiation sources external to the body, shall be used for determining the dose. This dose shall be described as the "effective dose equivalent". Every effort shall be made to ensure that actual doses to the public are as far below the basic dose limit as is reasonably achievable.

Under unusual circumstances, it will be permissible to allow potential doses to exceed 100 mrem/yr where such exposures are based upon scenarios that do not persist for long periods and where the annual lifetime exposure to an individual from the subject residual radioactive material would be expected to be less than 100 mrem/yr. Examples of such situations include conditions that might exist at a site scheduled for remediation in the near future or a possible, but improbable, one-time scenario that might occur following remedial action. These levels should represent doses that are as low as reasonably achievable for the site. Further, no annual exposure should exceed 500 mrem.

C. GUIDELINES FOR RESIDUAL RADIOACTIVE MATERIAL

C.1 Residual Radionuclides in Soil

Residual concentrations of radionuclides in soil shall be specified as above-background concentrations averaged over an area of 100 m^2. Generic guidelines for thorium and radium are specified below. Guidelines for residual concentrations of other radionuclides shall be derived from the basic dose limits by means of an environmental pathway analysis using site-specific data where available. Procedures for these derivations are given in the supplement.

If the average concentration in any surface or below-surface area less than or equal to 25 m^2 exceeds the authorized limit or guideline by a factor of $(100/A)^{1/2}$, where A is the area of the elevated region in square meters,

C.3 External Gamma Radiation

The average level of gamma radiation inside a building or habitable structure on a site to be released for unrestricted use shall not exceed the background level by more than 20 μR/h and shall comply with the basic dose limit when an appropriate-use scenario is considered. This requirement shall not necessarily apply to structures scheduled for demolition or to buried foundations. External gamma radiation levels on open lands shall also comply with the basic dose limit, considering an appropriate-use scenario for the area.

C.4 Surface Contamination

The generic surface contamination guidelines provided in Table 1 are applicable to existing structures and equipment. These guidelines are adapted from standards of the U.S. Nuclear Regulatory Commission (NRC 1982)* and will be applied in a manner that provides a level of protection consistent with the Commission's guidance. These limits apply to both interior and exterior surfaces. They are not directly intended for use on structures to be demolished or buried, but should be applied to equipment or building components that are potentially salvageable or recoverable scrap. If a building is demolished, the guidelines in Section C.1 are applicable to the resulting contamination in the ground.

C.5 Residual Radionuclides in Air and Water

Residual concentrations of radionuclides in air and water shall be controlled to levels required by DOE Environmental Protection Guidance and Orders, specifically DOE Order 5480.1A and subsequent guidance. Other Federal and/or state standards shall apply when they are determined to be appropriate.

D. AUTHORIZED LIMITS FOR RESIDUAL RADIOACTIVE MATERIAL

Authorized limits shall be established to (1) ensure that, as a minimum, the basic dose limits specified in Section B will not be exceeded under the worst-case plausible-use scenario consistent with the procedures and guidance provided or (2) be consistent with applicable generic guidelines, where such guidelines are provided. The authorized limits for each site and its vicinity properties shall be set equal to the generic or derived guidelines except where it can be clearly established on the basis of site-specific data -- including health, safety, and socioeconomic considerations -- that the guidelines are not appropriate for use at the specific site. Consideration should also be given to ensure that the limits comply with or provide a level of protection equivalent to other appropriate limits and guidelines (i.e., state or

*These guidelines are functionally equivalent to Section 4 -- Decontamination for Release for Unrestricted Use -- of NRC Regulatory Guide 1.86 (U.S. Atomic Energy Commission 1974), but they are applicable to non-reactor facilities.

other Federal). Documentation supporting such a decision should be similar to that required for supplemental limits and exceptions (Section F), but should be generally more detailed because the documentation covers the entire site.

Remedial action shall not be considered complete unless the residual radioactive material levels comply with the authorized limits. The only exception to this requirement will be for those special situations where the supplemental limits or exceptions are applicable and approved as specified in Section F. However, the use of supplemental limits and exceptions should be considered only if it is clearly demonstrated that it is not reasonable to decontaminate the area to the authorized limit or guideline value. The authorized limits are developed through the project offices in the field and are approved by the headquarters program office.

E. CONTROL OF RESIDUAL RADIOACTIVE MATERIAL AT FUSRAP AND REMOTE SFMP SITES

Residual radioactive material above the guidelines at FUSRAP and remote SFMP sites must be managed in accordance with applicable DOE Orders. The DOE Order 5480.1A and subsequent guidance or superceding Orders require compliance with applicable Federal and state environmental protection standards.

The operational and control requirements specified in the following DOE Orders shall apply to interim storage, interim management, and long-term management.

a. 5000.3, Unusual Occurrence Reporting System

b. 5440.1C, Implementation of the National Environmental Policy Act

c. 5480.1A, Environmental Protection, Safety, and Health Protection Program for DOE Operations, as revised by DOE 5480.1 change orders and the 5 August 1985 memorandum from Vaughan to Distribution

d. 5480.2, Hazardous and Radioactive Mixed Waste Management

e. 5480.4, Environmental Protection, Safety, and Health Protection Standards

f. 5482.1A, Environmental, Safety, and Health Appraisal Program

g. 5483.1A, Occupational Safety and Health Program for Government-Owned Contractor-Operated Facilities

h. 5484.1, Environmental Protection, Safety, and Health Protection Information Reporting Requirements

i. 5820.2, Radioactive Waste Management

E.3 Long-Term Management

Uranium, Thorium, and Their Decay Products

a. Control and stabilization features shall be designed to ensure, to the extent reasonably achievable, an effective life of 1,000 years and, in any case, at least 200 years.

b. Control and stabilization features shall be designed to ensure that Rn-222 emanation to the atmosphere from the wastes shall not (1) exceed an annual average release rate of 20 $pCi/m^2/s$ and (2) increase the annual average Rn-222 concentration at or above any location outside the boundary of the contaminated area by more than 0.5 pCi/L. Field verification of emanation rates is not required.

c. Prior to placement of any potentially biodegradable contaminated wastes in a long-term management facility, such wastes shall be properly conditioned to ensure that (1) the generation and escape of biogenic gases will not cause the requirement in paragraph b. of this section (E.3) to be exceeded and (2) biodegradation within the facility will not result in premature structural failure in violation of the requirements in paragraph a. of this section (E.3).

d. Groundwater shall be protected in accordance with appropriate Departmental Orders and Federal and state standards, as applicable to FUSRAP and remote SFMP sites.

e. Access to a site should be controlled and misuse of on-site material contaminated by residual radioactivity should be prevented through appropriate administrative controls and physical barriers -- active and passive controls as described by the U.S. Environmental Protection Agency (1983--p. 595). These controls should be designed to be effective to the extent reasonable for at least 200 years. The Federal government shall have title to the property.

Other Radionuclides

f. Long-term management of other radionuclides shall be in accordance with Chapters 2, 3, and 5 of DOE Order 5820.2, as applicable.

F. SUPPLEMENTAL LIMITS AND EXCEPTIONS

If special site-specific circumstances indicate that the guidelines or authorized limits established for a given site are not appropriate for a portion of that site or for a vicinity property, then the field office may request that supplemental limits or an exception be applied. In either case, the field office must justify that the subject guidelines or authorized limits are not appropriate and that the alternative action will provide adequate

b. Where remedial action -- even after all reasonable mitigative measures have been taken -- would produce environmental harm that is clearly excessive compared to the health benefits to persons living on or near affected sites, now or in the future. A clear excess of environmental harm is harm that is long-term, manifest, and grossly disproportionate to health benefits that may reasonably be anticipated.

c. Where it is clear that the scenarios or assumptions used to establish the authorized limits do not, under plausible current or future conditions, apply to the property or portion of the site identified and where more appropriate scenarios or assumptions indicate that other limits are applicable or necessary for protection of the public and the environment.

d. Where the cost of remedial action for contaminated soil is unreasonably high relative to long-term benefits and where the residual radioactive material does not pose a clear present or future risk after taking necessary control measures. The likelihood that buildings will be erected or that people will spend long periods of time at such a site should be considered in evaluating this risk. Remedial action will generally not be necessary where only minor quantities of residual radioactive material are involved or where residual radioactive material occurs in an inaccessible location at which site-specific factors limit their hazard and from which they are costly or difficult to remove. Examples include residual radioactive material under hard-surface public roads and sidewalks, around public sewer lines, or in fence-post foundations. A site-specific analysis must be provided to establish that it would not cause an individual to receive a radiation dose in excess of the basic dose limits stated in Section B, and a statement specifying the level of residual radioactive material must be included in the appropriate state and local records.

e. Where there is no feasible remedial action.

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H. REFERENCES

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June 25, 1987

Jerome F. Wing, Supervisor
Project Support Group
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Oak Ridge Operations
P.O. Box E
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Dear Mr. Wing:

Enclosed are 20 copies of the finalized Action Description Memorandum (ADM) for Proposed Decontamination of the Albany Research Center in Albany, Oregon. All Department of Energy and Bechtel National, Inc. comments have been incorporated.

Please feel free to call if you have any questions.

Sincerely,

Nick Beskid

Nicholas J. Beskid
Energy and Environmental Systems Division

NJB:mav

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