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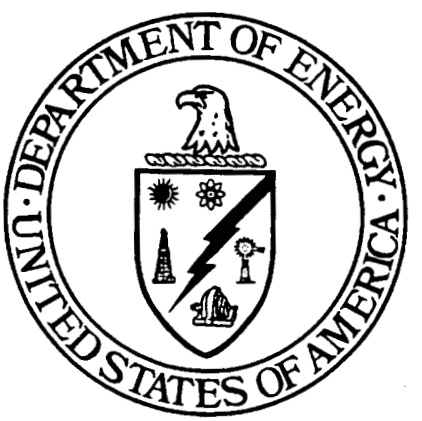
WORK PLAN FOR ECOLOGICAL RESTORATION RESEARCH GRANTS OPERABLE UNIT 4 SUPPLEMENTAL PROJECT

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO



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U.S. DEPARTMENT OF ENERGY
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1.0 INTRODUCTION

As part of a Dispute Resolution Agreement regarding Operable Unit 4 (OU4) milestones for the Fernald Vitrification Facility, the U.S. Environmental Protection Agency (U.S. EPA) and the U.S. Department of Energy - Fernald Environmental Management Project (DOE-FEMP) agreed to five environmental projects and a cash penalty. One of these five projects is the establishment of ecological research grants which will include pilot scale ecological restoration activities in the field.. The Dispute Resolution Agreement included the provision that DOE would submit a work plan to U.S. EPA and Ohio EPA (the EPAs) that identifies research projects involving actual field work that would support the proposed ecological restoration efforts at the FEMP. This work plan and a project schedule will be submitted by November 21, 1997 for review and approval by U.S. EPA. This work plan summarizes the project-specific design and field activities planned for these ecological research grants.

2.0 GENERAL APPROACH

The purpose of the ecological restoration research grants is to conduct pilot scale ecological restoration activities in the field that will be representative of possible site restoration strategies. Information obtained as a result of implementing the grant projects would be used to support the planning and implementation of final ecological restoration of the FEMP. The research grants were selected based on the proposed implementation of large-scale ecological restoration activities as outlined in the draft Natural Resource Restoration Plan (NRRP) which was developed for the Fernald Natural Resource trustees to resolve DOE liability for damages to natural resources under CERCLA Section 107. The proposed ecological restoration activities will predominantly involve establishment and management of native forest cover and grasslands, restoration and enhancement of habitat for the federally endangered Indiana bat, and establishment of habitat for the federally endangered Running Buffalo Clover.

DOE has solicited input from interested universities and groups regarding the implementation of potential research grants. The tentative selection of universities and groups will be discussed with the EPAs prior to approval of the work plan. Upon approval of the work plan, specific tasks will be issued to the selected universities and groups to begin the implementation of the grant projects.

3.0 ECOLOGICAL RESTORATION RESEARCH GRANTS

As mentioned above, the research grants are intended to provide information to assist in the planning and implementation of final ecological restoration of the FEMP. There are three general areas of ecological research which will be emphasized: (1) vegetation plots, (2) habitat for target species, and (3) invasive species control. Annual reports will accompany each research grant to provide information to the agencies regarding the status and progress of each grant. These research areas are described in more detail below.

3.1 Representative Vegetation Plots

The first component of this grant is to restore all of Area 8, Phase I with plant communities of herbs, shrubs, and trees. Trees will be planted to establish native forest cover to demonstrate the type of restoration to be implemented on the remainder of the FEMP. The trees would consist of seedlings and saplings and would exhibit a natural appearance by spatially patterning the trees with a random patch design. The trees will be planted with varying densities within eight plots (Figure 1). Establishing the vegetation within plots will allow the monitoring of vegetative success and ultimately the implementation of a success monitoring methodology. Measurements and observations over a three- to four-year period will include aesthetics, intraspecific competition, herbivore control techniques, rates of growth, survival, and econometrics (cost-benefit analyses). To protect the seedlings from vertebrate herbivores, half of the seedlings will receive tree tubes and half will receive application of an organic substance (i.e., game repellent).

The establishment of native forest cover will provide good habitat for edge-dwelling forest wildlife and will provide a portion of the viewshed for the Habitat Area Supplemental Project. The combination of seedlings and saplings will provide an immediate visible demonstration of future restoration efforts. This restoration project will contribute to the overall objectives of natural resource restoration by providing various habitats at different stages of maturity, and by testing and comparing the econometrics and effectiveness of planting methodologies and herbivore control techniques which could be implemented by future restoration projects.

The second component of this grant is to establish a tallgrass prairie bordered by a scrub-shrub transition area in Area 8, Phase I (Figure 1). The prairie seed mix will be applied at approximately 20 lbs./acre and will include grass species and forbs. Prairie grass species will include Big Bluestem,

Little Bluestem, Indian Grass, Switch Grass, and forbes (to be determined). Oats will be supplied at a nurse crop at a rate of approximately 20 lbs./acre.

A separate research grant will involve establishing test plots in disturbed portions of Area 1, Phase I in which FDF will experiment with the revegetation of those areas (Figure 2). Different mixes and application rates of native prairie species (and potentially tree species) will be planted and managed to determine the optimal method and species mix for revegetating disturbed areas of the site. The test plots would be measured for percent cover over a two- to three-year period. The number and size of the test plots will depend on available space within Area 1, Phase I. Seed mix and application rates will be similar to Area 8, Phase I.

3.2 Pilot Restoration Projects for Target Species

Indiana Bat Restoration: The focus of this project is to improve the habitat in the northern portion of the Paddys Run corridor for the federally endangered Indiana Bat (Figure 2). Since the Indiana Bat does not use typical structures, specially designed structures will be constructed and installed as appropriate to provide habitat for the Indiana Bat. In addition, enhancement of existing habitat will consist of selective canopy opening near roost trees to allow additional light penetration and will be implemented as appropriate and assessed for effectiveness in attracting the Indiana Bat.

Running Buffalo Clover Restoration: Running Buffalo Clover is currently listed as a federally endangered species. This species prefers a habitat with well-drained soil, filtered sunlight, limited competition from other plants, and periodic disturbance. This project entails collecting and transplanting population(s) in Area 8, Phase I from an off-site location(s) after acquiring all necessary permits (Figure 1). Plots will be established within an approximate 0.5 acre areas. Interpretive signs will be placed near the transplanted habitat area to denote the importance of this species. The project will monitor the establishment of the transplanted populations.

American Chestnut Restoration: This project will focus on re-establishing a population of blight resistant American Chestnut trees in Southwest Ohio. Hybrid seeds, which are 7/8ths pure American Chestnut, will be obtained from the American Chestnut Foundation after DOE has signed a germplasm and maintenance agreement. Seedlings will be grown in a nursery and planted in a secure area approximately 0.5 - 1 acre in Area 8, Phase I (Figure 1). Individual trees will be monitored for shape,

growth characteristics, shade tolerance and resistance to Endothia parasitica (chestnut blight). The overall health of the population will also be monitored. This project will help re-establish a viable population of Chestnut trees. Interpretive signs will be placed near the chestnut grove to denote the importance of this species. It is expected that increased public awareness about the severe damage associated with the spread of invasive plants and pathogens is the best way to prevent accidental introductions.

3.3 Invasive Species Control

The goal of this project is to demonstrate the optimal method for controlling invasive species in the Northern Woodlot, and evaluate the feasibility of revegetating an area previously dominated by invasive species. This research is proposed to occur in the northern woodlot or in deciduous woodlot north of the pine plantation (Figure 2). The designated area would be surveyed for invasive species present, and a map would be generated to exhibit the areas of occurrence. Several plots (~0.5 acre) would be isolated, the invasive species would be extirpated by cutting the base of the invasive followed by herbicide application, and the plots would be replanted with native non-invasive species. The method of extirpation has been commonly used, however, the establishment of non-invasive native species to replace invasive species is not well understood. Monitoring would be performed to assess the invasive and introduced non-invasive species populations.

4.0 SCHEDULES AND DELIVERABLES

The schedule for the research grants is provided in Table 1. The OU4 Dispute Resolution Agreement committed DOE-FEMP to the submittal of this work plan to the EPAs by November 21, 1997. This work plan will be made available for public inspection in parallel with the review by the EPAs.

The work plan will be revised based on the EPAs comments and resubmitted in final form in March 1998 for the EPAs review and approval. The final work plan will include final project locations and proposed recipients of the grants. Upon approval of the work plan, task orders/contracts will be initiated to begin field work. The task orders for each research grant will contain detailed information regarding methodology and duration of monitoring. Field work cannot be initiated until the Area 8, Phase I research area (Figure 1) is certified as clean, which is expected to occur by July 1998. The Indiana Bat and invasive species projects could be conducted in non-certified areas since ground disturbance would be minimal. The establishment of revegetation test plots in Area 1, Phase I using

prairie species (Figure 2) is not contingent upon certification as the area has already been certified as clean.

TABLE 1
SCHEDULE FOR RESEARCH GRANTS

Activities for Research Grants	Schedule Dates
Submit Work Plan to EPA*	11/21/97
EPA Review of Work Plan	11/21/97 - 1/26/98
DOE/FDF Revise Work Plan	1/27/98 - 3/2/98
Submit Final Work Plan to EPA/Public Review	3/24/98 - 4/27/98
DOE Development of Task Order	
Issue Task Order/Initiate Research Grants	6/15/98

*Enforceable milestone per the Dispute Resolution Agreement between U.S. EPA and U.S. DOE

5.0 PROJECT COSTS

The estimated cost for implementing the research grants is $200,000. The cost of each research grant is dependent upon the cost of required materials and the scope of each research grant. Discussions are being conducted with interested Universities and groups to better define project scope and costs. The final version of the work plan will contain the grant recipients and associated costs.

6.0 RELATED DOCUMENTS

The research grants will enhance the proposed final land-use as outlined in the draft NRRP, and will also contribute to refinement of management techniques to be implemented during large scale restoration. The NRRP is currently being developed by DOE-FEMP and the other Fernald Natural Resource Trustees and is expected to be finalized in early 1998. The NRRP identifies the majority of the FEMP, outside of the area dedicated for the On-Site Disposal Facility, as an undeveloped park. The NRRP identifies the remediated Former Production Area, Waste Pit Area and Southern Waste Units as being restored to a natural area taking advantage of the post-excavation topography to the extent possible. The riparian corridor along Paddys Run and the existing Northern Woodlot, which will not be greatly disturbed, would be expanded and enhanced. The research grants will provide additional information for effective management and implementation of ecological restoration in these areas.

7.0 HEALTH AND SAFETY REQUIREMENTS

All personnel working on these projects will be briefed on and comply with the Project-Specific Health and Safety Matrix and required to comply with it. The Field Safety Contact will ensure that each participant has been briefed on the applicable permits and the Project-Specific Health and Safety Matrix, as applicable.

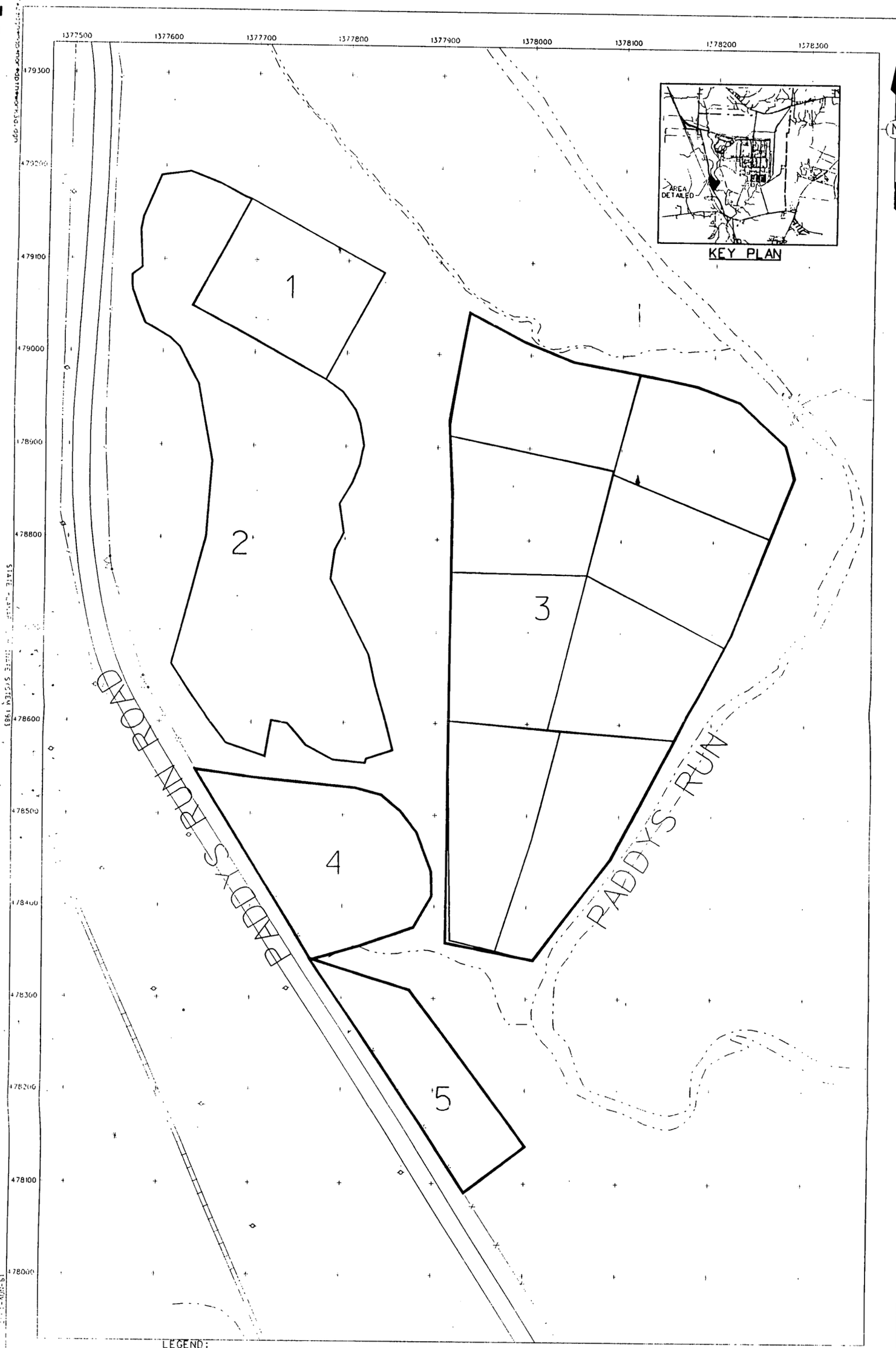

FIGURE 1. ECOLOGICAL RESEARCH PLOTS

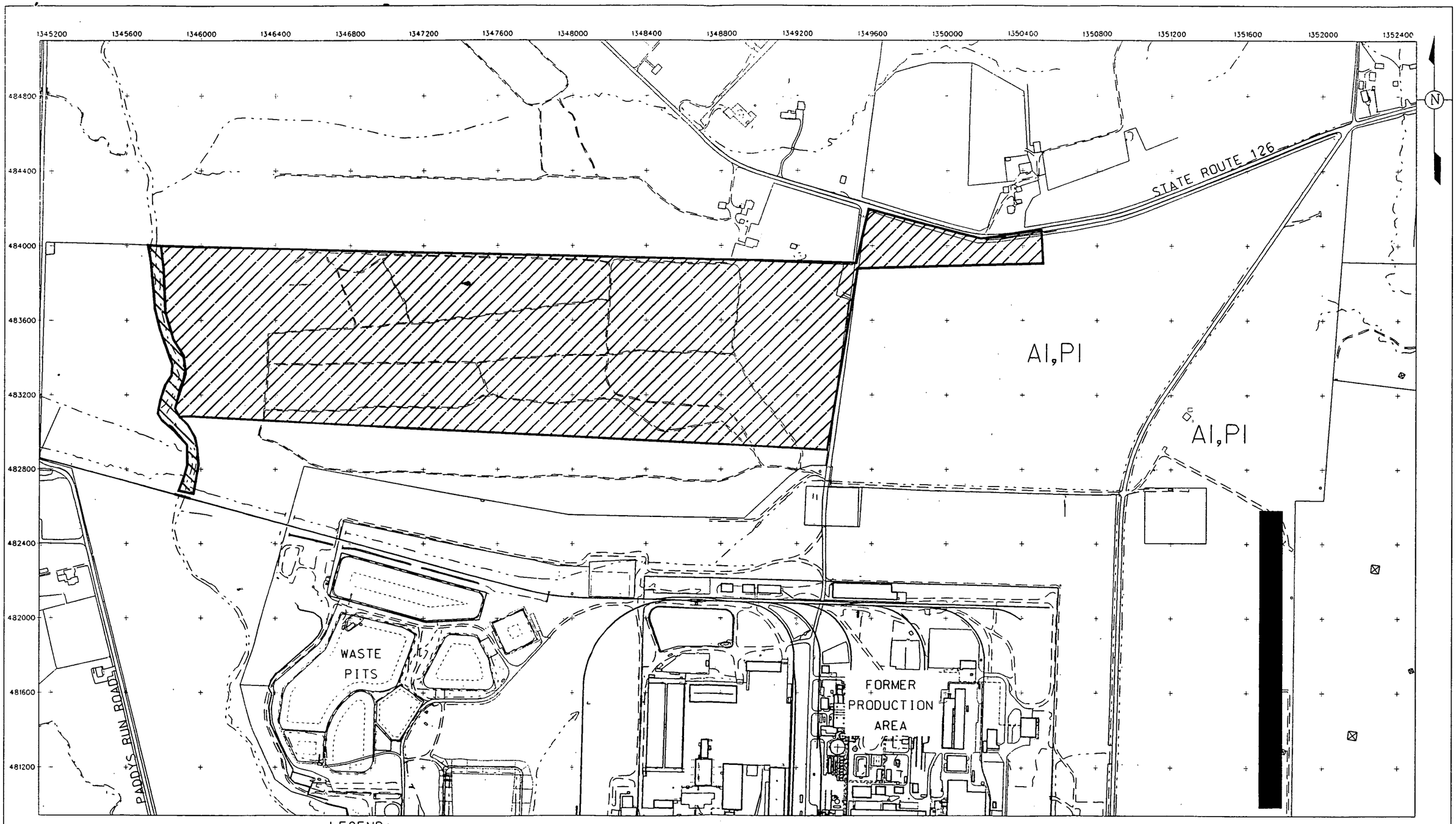

FIGURE 2. ECOLOGICAL RESEARCH AREAS