CALIFORNIA DEPARTMENT OF CORRECTIONS

CALIFORNIA STATE PRISON
DEL NORTE COUNTY

ENVIRONMENTAL ASSESSMENT STUDY

PUBLICATION DATE: NOVEMBER 1986

uthorized by Section 7012 of the Penal Code. Provisions of the California Environmental Quality
y to the acquisition of real property, planning, design, construction, operation, or maintenance of

PROJECT TITLE

California State Prison

Del Norte County

TYPE OF ASSESSMENT

Environmental Assessment Study

AGENCY

California Department of Corrections
Planning and Construction Division
630 K Street
Sacramento, California 95814

PREPARED BY

Department of General Services
Office of Project Development and Management
400 P Street, Suite 3460
Sacramento, California 95814
(916) 324-0214

TABLE OF CONTENTS

		Page
EXECUTIVE SUMMARY		1
1.	INTRODUCTION	11
2.	PROJECT DESCRIPTION	14
	A. Project Location	14
	B. Project Characteristics	14
3.	ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION MEASURES	22
	A. Introduction	22
	B. Geology	25
	C. Hydrology	32
	D. Plant and Animal Life	40
	E. Air Quality	48
	F. Noise	55
	G. Light and Glare	63
	H. Transportation and Circulation	68
	I. Utilities	81
	Gas	81
	Electricity	81
	Telephone	83
	Solid Waste	84
	Sewage Disposal	87
	Drinking Water	94
	J. Archaeology	100
	K. Energy	107

EXECUTIVE SUMMARY

PROJECT

This Environmental Assessment Study (EAS) has been prepared by the California Department of Corrections for the construction of a proposed 2,200-bed maximum security prison on a site north of Crescent City in Del Norte County. The design bed capacity of the proposed prison facility will be divided as follows: 1,000 Level IV beds (maximum security); 1,000 security housing unit beds (SHU); and 200 Level I (minimum security). Security housing units provide specialized housing on a Department-wide basis for inmates whose conduct endangers the safety of others or the security of the institution. The authorization for the construction of the proposed California State Prison - Del Norte County is provided for in Chapter 533, Statutes of 1986 (Senate Bill 1222).

The provisions of the California Environmental Quality Act do not apply to this project. The direction to prepare this EAS is provided in Chapter 933, Statutes of 1986 (Senate Bill 253).

The proposed prison site consists of an approximately 430 acre parcel located 7.4 miles northeast of Crescent City and 0.8 miles south of the community of Fort Dick. The project site, commonly referred to as Malarkey Forest, consists of forest lands that have been previously logged. The proposed prison will be situated on a 260 acre portion of the Malarkey Forest parcel that lies between Lake Earl Drive and U.S. Highway 101. At the present time, the Department has no plans for any construction activities on the remaining 170 acre portion of the parcel that lies on the west side of Lake Earl Drive.

Preliminary plans for the proposed facility provide for the prison to be constructed near the center of the subject parcel. The prison buildings will cover approximately 100 acres. An additional 140 acres will be used for open space and security zones around the prison. Access to the site will be from a single driveway on Lake Earl Drive.

Based upon projections of future inmate populations and Department experience, the likely long-range inmate level for this facility is approximately 2,600

inmates or 120 percent of design capacity. At this level the proposed prison will employ approximately 1,300 full-time staff. If the proposed prison is operated at 190 percent of design occupancy (the maximum occupancy level), there will be approximately 4,000 inmates and approximately 1,570 staff will be employed.

There will be work, academic, or vocational program opportunities for all inmates. Prison industries that have been tentatively planned for this facility include: boot and shoe manufacturing, an optical laboratory, laundry, administration, maintenance shops, and warehousing operations. The vocational programs that are tentatively planned for this facility include such activities as: dry cleaning, shoe repair, landscape maintenance, graphic arts, carpentry, and auto and body and fender repair.

Total project costs are currently estimated to be $233 million. Construction costs are based on current prices escalated 6 percent for inflation to the estimated midpoint of construction (September 1988). Costs include an allowance for such factors as sources of labor, subsistence, and transportation of materials costs. The site location factor for the Crescent City area is estimated to be up to 10 percent of the total project construction costs.

Construction of the proposed State prison is scheduled to begin in spring 1987. The prison will be occupied in phases as each cluster of housing units is completed. The Department anticipates that this institution will be fully operational in approximately two and a half to three years after the start of construction.

SUMMARY OF THE ENVIRONMENTAL ASSESSMENT STUDY

GEOLOGY

Environmental Effects

The proposed project site consists of a gently sloping to nearly flat parcel underlain by marine terrace material of unconsolidated medium-grained quartz sands alternating with layers of silty clay and gravels. Depth to groundwater is 5 to 26 feet.

The Grogan Fault passes approximately 15 miles west of the project site. This offshore fault is considered active with a maximum credible earthquake of 6.5 on the Richter scale. The subject parcel has a moderate potential for liquefaction due to the saturated sand layers beneath the site surface. The Malarkey Forest site is not subject to surface rupture, slope instability, or other geological hazards.

Mitigation Measures

The proposed facility will be designed to ensure that critical structures can withstand the effects of a large earthquake, including the potential for liquefaction.

The proposed project is not expected to have any direct, off-site effects on the geology of the Malarkey Forest area.

HYDROLOGY

Environmental Effects

There are no lakes or permanent streams on or immediately adjacent to the project site. The Malarkey Forest parcel is presently drained by two shallow channels that only have seasonal flows. Because of the low slope of the site terrain, portions of the parcel are marshy in winter. The project area is outside of the 100-year floodplain of Lake Earl, which is located approximately a mile west of the prison site. There is very little upslope drainage onto the project site from lands adjacent this parcel.

Clearing of the site and construction of the prison will increase the amount and flow rate of runoff from the site. Clearing of the project area will also increase the potential for surface erosion.

The proposed project will not use wells to supply water to the prison.

Mitigation Measures

The project site will be provided with a drainage system that will control site runoff and surface erosion. A large detention pond on the west side of the project area will limit storm water releases to the peak levels experienced under present site conditions. Open space areas of the prison grounds will be revegetated with grasses or other appropriate plants to reduce surface erosion. These measures will substantially reduce the potential of site runoff affecting water quality in Lake Earl.

Temporary detention basins and other erosion control measures will be used during construction of the prison to reduce off-site sedimentation.

PLANT AND ANIMAL LIFE

Environmental Effects

The principal plant community in the study area is second growth coast redwood forest. The natural vegetation of the project area has been heavily disturbed by past logging activities. Much of the site is covered with redwood stumps, slash piles, and skid trails. The project area is not reported to contain any threatened or endangered plant or animal species.

Construction of the proposed prison will require the clearing of approximately 240 acres of the site for prison facilities and security zones. Prison buildings and other related facilities will cover approximately 100 acres of the site. Approximately 140 acres of the prison grounds will be used for open space and security zones. Clearing of this parcel and development of the prison are unavoidable effects of the project.

Because of the institutional nature of the prison, the amount of remaining open space around the prison, the buffer zone of existing vegetation that will be left around the edge of the parcel, and the existing developed uses on some

of the lands adjacent to the site, the proposed project is expected to have a low to moderate effect on the biological resources of the Malarkey Forest area.

Mitigation Measures

There are no feasible mitigation measures available to completely eliminate the effects of the project on the biological resources of the Malarkey Forest parcel.

AIR QUALITY

Environmental Effects

The proposed prison will result in an increase in vehicular emissions. However, these increases are not considered significant because of the existing background levels of air pollutants and the relatively low volume of vehicular emissions that will be generated by the prison.

During the clearing of the site particulate emissions will be generated by the burning of woodwaste and stumps.

Mitigation Measures

The Department will require that disposal of woodwaste from the site minimize particulate emissions and is done in coordination with the procedures of the North Coast Unified Air Quality Management District.

NOISE

Environmental Effects

The proposed project is generally not expected to affect existing noise levels because of the enclosed, institutional nature of a prison operation and the rural setting of the project area. However, noise from the prison's firing range will be noticeable to residences located close to the southwestern corner of the Malarkey Forest parcel. Traffic-generated noise levels will also incrementally increase along portions of Lake Earl Drive near the project site.

Mitigation Measures

Safety berms provided at the firing range will significantly reduce the amount of noise generated by this activity. Other factors such as intervening vegetation, traffic noise from Lake Earl Drive, and the physical distance between the range and the adjacent residences will serve to reduce the effects of noise generated by use of the range.

The incremental increase in traffic-generated noise levels along Lake Earl Drive is an unavoidable effect of the project.

LIGHT AND GLARE

Environmental Effects

The proposed project will represent a new source of light in the Kings Valley area. However, the effects of this new source of light on adjacent residences will be greatly minimized by the remaining forest lands that will surround the prison buildings and the internally directed nature of the lighting system.

Mitigation Measures

There are no feasible mitigation measures available to completely eliminate this new source of necessary prison lighting.

TRAFFIC

Environmental Effects

The proposed prison will increase traffic on portions of Lake Earl Drive, Kings Valley Road, U.S. Highway 101, and other streets in the project area. Because of the existing capacity of the local highway system and the projected traffic volumes generated by the prison, the Department does not expect the proposed project to have any significant effects on streets that serve this area.

The Department will design the entrance to the prison on Lake Earl Drive so that it does not cause safety or traffic problems.

Mitigation Measures

The project will not have a significant effect on area traffic so no mitigation measures are necessary.

UTILITIES

Environmental Effects

1. Natural Gas. There is no natural gas service available in the project area.

2. Electricity. The proposed project will have a peak electrical demand of approximately 10 megawatts. Representatives of the Pacific Power and Light Company have indicated that electrical service can be extended to the project site without causing any major disruptions to other users in the Del Norte County area.

3. Telephone. Representatives of the West Coast Telephone Company have indicated that telephone service can be extended to the project without causing major disruptions to other users in the Del Norte County area. Extension of service to the prison will require an upgrading of certain parts of the local telephone system because it presently lacks the capacity to accommodate a major new user.

4. Solid Waste. The proposed prison will generate approximately 3,150 tons of solid waste per year. The Department plans to reduce the amount of waste requiring disposal by approximately 730 tons per year through an in-house recycling program operated by the inmates. This leaves approximately 2,400 tons per year that will require disposal from the prison.

   The Department is presently considering four solid waste disposal alternatives including the use of: (1) the Del Norte County Landfill near Crescent City; (2) the Humboldt County Landfill near Eureka; and (3) the Brookings Energy Facility in Brookings, Oregon. The Department would also consider using a new Del Norte County landfill if one was developed in the Crescent City area.

While the prison will be a new source of waste requiring disposal, the quantity generated is expected to have only a minor effect on the capacity of the existing facilities in this region.

The proposed project will not generate significant quantities of material that could be considered hazardous. Such material will be stored and disposed of in compliance with the applicable State and federal regulations.

5. Sewage Disposal. The proposed prison will generate an average wastewater flow of approximately 0.75 million gallons per day. The prison would have a maximum daily flow of approximately 1.1 million gallons of wastewater.

   The Department is presently considering three alternative means of wastewater disposal. These include: (1) on-site wastewater treatment plant with effluent disposal in off-site rapid infiltration basins; (2) on-site wastewater plant with effluent disposal through the Crescent City ocean outfall; and (3) off-site treatment and effluent disposal at the Crescent City treatment plant.

6. Drinking Water. The proposed prison would have a maximum annual water demand of approximately 1,000 acre-feet. Water would be provided by connecting to the existing Crescent City water facility on the Smith River northeast of the prison site. Use of the City's water system will require increasing the existing water appropriation by 1,000 acre feet per year.

   Based upon average annual flows, the proposed increase would not have a significant effect on the resources of the Smith River.

Mitigation Measures

1. Natural Gas. None required.

2. Electricity. None required.

3. Telephone. None required.

4. Solid Waste. The generation of solid waste is an unavoidable effect of the project. However, the Department does plan to implement a recycling and salvage program that would reduce the amount of solid waste requiring disposal.

5. Wastewater. Generation of wastewater effluent is an unavoidable effect of the project. Either on or off-site facilities receiving wastewater from the prison will be designed and operated in compliance with the requirements of the California Water Resources Control Board and other applicable regulations.

6. Drinking Water. None required.

ARCHAEOLOGY

Environmental Effects

The project site does not contain any known archaeological or historical sites. The proposed infiltration basin and a portion of an off-site pipeline corridor are located near sites that may contain archaeological or historical artifacts.

Mitigation Measures

The Department will have a qualified archaeologist available during grading or trenching activities on the rapid infiltration basin and on the pipeline corridor that is northeast of the prison site to recover artifacts or determine the need for additional site evaluations.

ENERGY

Environmental Effects

The proposed project will require the use of renewable and nonrenewable resources such as electricity and gasoline. Use of these resources is an unavoidable effect of the project. However, the proposed project is not expected to affect the availability of energy resources to other users in the Del Norte County area.

Mitigation Measures

The proposed facility will be designed to conserve energy. Department employees will also be encouraged to form carpools to reduce gasoline usage.

1. INTRODUCTION

This Environmental Assessment Study (EAS) has been prepared by the California Department of Corrections for the construction of a proposed 2,200-bed maximum security (Level IV) prison on a site north of Crescent City in Del Norte County. The authorization for the construction of the proposed Del Norte State Prison is provided for in Chapter 533, Statutes of 1986 (Senate Bill 1222).

The provisions of the California Environmental Quality Act do not apply to this project. The direction to prepare this EAS is provided in Chapter 933, Statutes of 1985 (Senate Bill 253). SB 253 provides that, "...immediate expansion of the prison system by the swiftest possible means is necessary to relieve the system from current and anticipated overcrowding and to maintain the public safety and security." The California prison system is presently operating at approximately 170 percent of its design capacity. In addition to taxing the operational capacities of the existing facilities, these overcrowded conditions pose a severe safety threat to both correctional facility personnel and inmates.

The purpose of this EAS is to provide governmental decision-makers and the general public with information on the direct off-site environmental effects of the proposed project. Section 7012(a) of the California Penal Code provides that the EAS will address the following areas:

1. Geology
2. Hydrology - groundwater
3. Water Quality - surface waters
4. Plant and Animal Life - endangered and rare species
5. Air Quality
6. Noise
7. Light and Glare
8. Utilities - gas, electricity, telephone, solid waste, sewage disposal, drinking water
9. Archaeology
10. Energy

Because the statutes that authorize other prisons include the topic of traffic, the Department has included a discussion of the traffic generated by the proposed prison in this EAS.

The EAS will also provide information on the mitigation measures that are available to substantially lessen or avoid the proposed project's significant environmental effects.

In accordance with Section 7012 (d & e) of the Penal Code, members of the Joint Legislative Committee on Prison Construction and Operations have 30 days from the receipt of this report to adopt a recommendation on the EAS. The Committee is required to hold a public hearing on this study in Crescent City. Members of the Del Norte County Board of Supervisors and the Crescent City Council will be invited to participate in this meeting. The EAS shall be deemed to have received a recommendation of concurrence if the Committee does not take action on the study within 30 days of its submittal to the Committee.

Pursuant to Section 7012(c) of the California Penal Code, the approval of this EAS by the State Public Works Board is the only approval required for compliance with any applicable environmental requirements. Approval of the study by the State Public Works Board shall be final and binding on all parties. The Department notes, however, that the proposed project is subject to other State or federal permit requirements, such as those of the State Water Resources Control Board, the North Coast Regional Water Quality Control Board, and the Department of Health Services.

Copies of this Environmental Assessment Study are available for public review at the following locations:

California Department of Corrections
Planning and Construction Division
P. O. Box 942883
Sacramento, CA 94283-0001
Office of Government and Community Relations
Telephone: (916) 324-8963

Offices of the Del Norte County Board of Supervisors
450 H Street
Crescent City, CA 95531

Offices of the City Council, Crescent City
450 H Street
Crescent City, CA 95531

Del Norte County Library
190 Price Mall
Crescent City, CA 95531

Questions about the scope, content, or approval process for this environmental assessment study for the proposed State prison in Del Norte County should be directed to:

Diana Johnson, Program Manager
Department of Corrections
Planning and Construction Division
Government and Community Relations Branch
P. O. Box 942883
Sacramento, CA 94283-0001
Telephone: (916) 324-8963

Robert Sleppy, EAS Project Manager
Department of General Services
Office of Project Development
and Management
400 P Street, Suite 3460
Sacramento, CA 95814
Telephone: (916) 324-0214 or
ATSS 454-0214

2. PROJECT DESCRIPTION

A. Project Location

The proposed prison site consists of an approximately 430 acre parcel located 7.4 miles northeast of Crescent City and 0.8 miles south of the community of Fort Dick (see Figure 1). The project site, commonly referred to as Malarkey Forest, consists of forest lands that have been previously logged. The proposed prison will be situated on approximately 260 acres in the eastern portion of the Malarkey Forest parcel between Lake Earl Drive and U.S. Highway 101 (see Figure 2). This portion of the site is outside of the Coastal Zone. At the present time, the Department has no plans for any construction activities on the remaining 170 acres of the parcel on the west side of Lake Earl Drive.

B. Project Characteristics

Proposed Project

The proposed Del Norte State prison will be designed to accommodate (at 100 percent design bed capacity) 1,000 Level IV inmates, 1,000 inmates requiring cells classified as Security Housing Units (SHU), and 200 Level I inmates. Security housing units provide specialized housing on a Department-wide basis for inmates whose conduct endangers the safety of others or the security of the institution.

Present Department of Corrections policy allows the overcrowding of Level IV facilities up to 190 percent of design bed capacity. The inmate population at this type of facility could be increased by double-celling inmates in the Level IV and Security Housing Units. The Department normally does not overcrowd the Level I facilities. If this facility is overcrowded to the 190 percent level, the total population at this prison would be approximately 4,000 inmates. Because of the possibility of overcrowding, the Department will design and construct the prison's utility and operational systems to accommodate these higher inmate populations.

TABLE 1: DESCRIPTION OF SECURITY CLASSIFICATIONS

Level I*

Level I is the lowest level of inmate custody, consisting of dormitory housing surrounded by an indirectly supervised perimeter or without a secure perimeter. Typically, small Level I security facilities are established to operate in conjunction with Level III and/or Level IV prisons; inmates in Level I facilities perform appropriate support service functions. Conservation camps and community based re-entry beds are included in Level I units. Level I housing units are normally located outside the secure perimeter in combined security level facilities.

Level II

Level II is more restrictive than Level I. Housing characteristics for Levels I and II are basically the same; however, Level II facilities have a more secure perimeter, including a double fence, that is constantly supervised by armed correctional officers in perimeter towers.

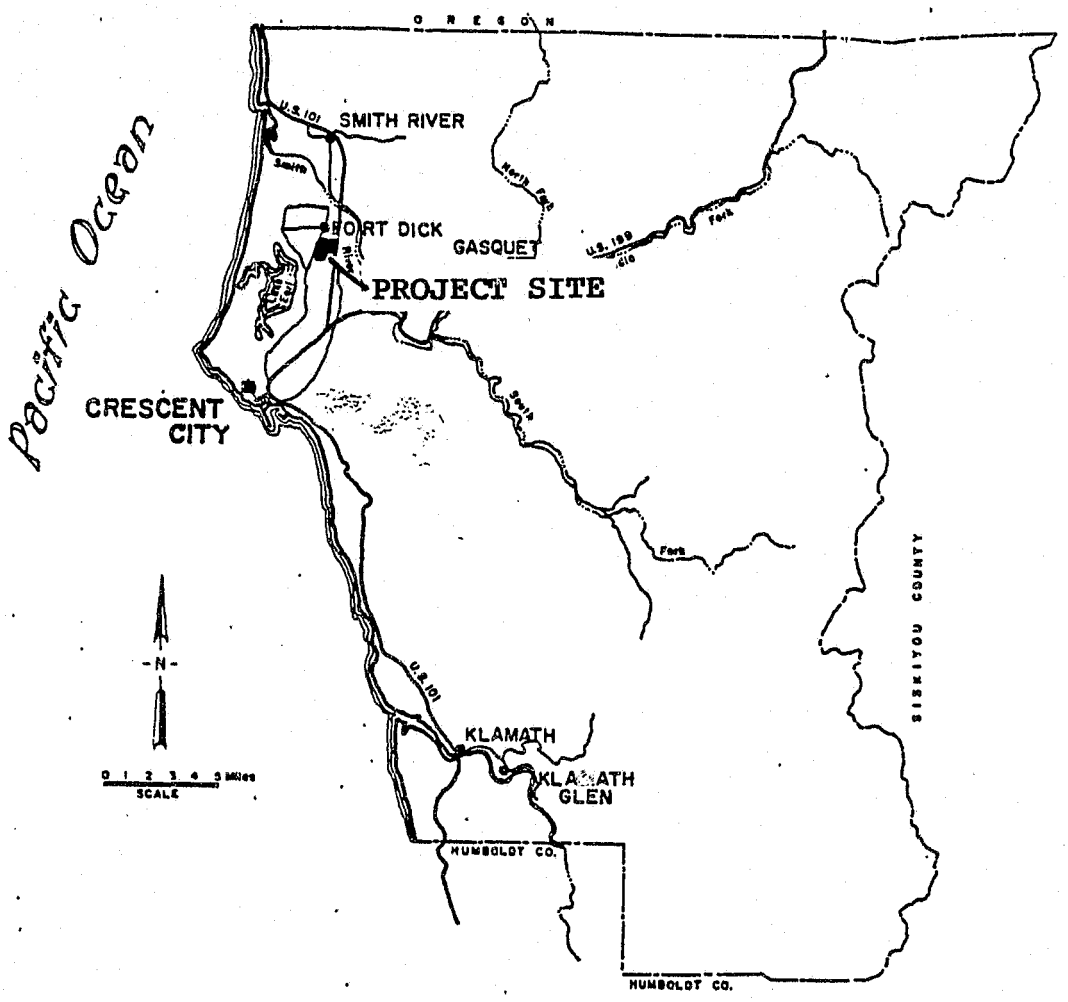
Level III

The institution for this classification level requires celled housing and more secure perimeters including double fencing, increased lighting, and additional towers that are constantly supervised by armed correctional officers. Generally, inmate movement within the institution is more closely supervised and controlled.

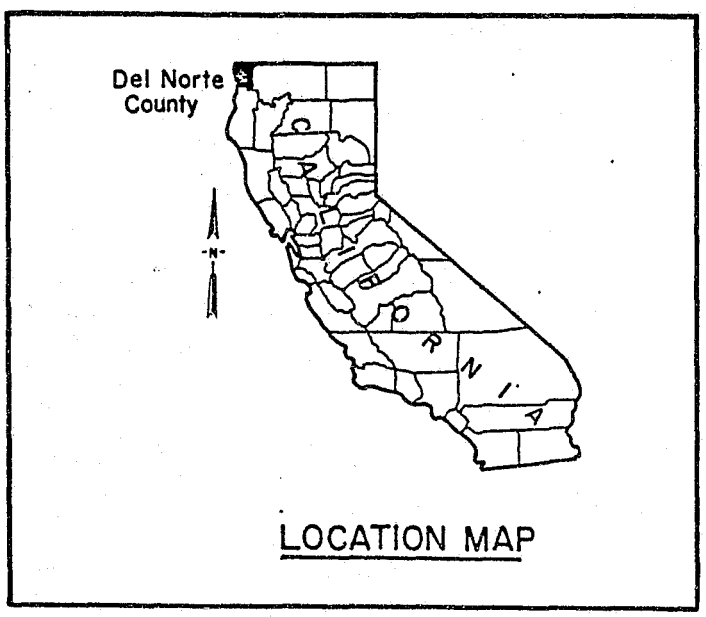
Level IV*

Level IV classification requires the most restrictive and secure environment. Housing consists of cells that are surrounded by a secure perimeter including walls, fencing, increased lighting, and towers that are constantly supervised by armed correctional officers. Level IV facilities are routinely provided with gun coverage in the recreational yards. Correctional officers are provided with access to guns in the housing units, gymnasium, and dining areas. Inmate movement is strictly controlled. Housing units in Level IV facilities are structured to provide the highest level of inmate manageability: administrative segregation of individuals or groups of varying size is possible for those inmates who require carefully controlled isolation from the rest of the inhabitants. Level IV facilities employ electronic intrusion detection systems in perimeter areas.

*The inmates in the 200 bed minimum security support facility would have a Level I classification. The maximum security inmates would have a Level IV classification. The inmates in secured housing units probably would have a Level IV classification, but would require special security precautions.



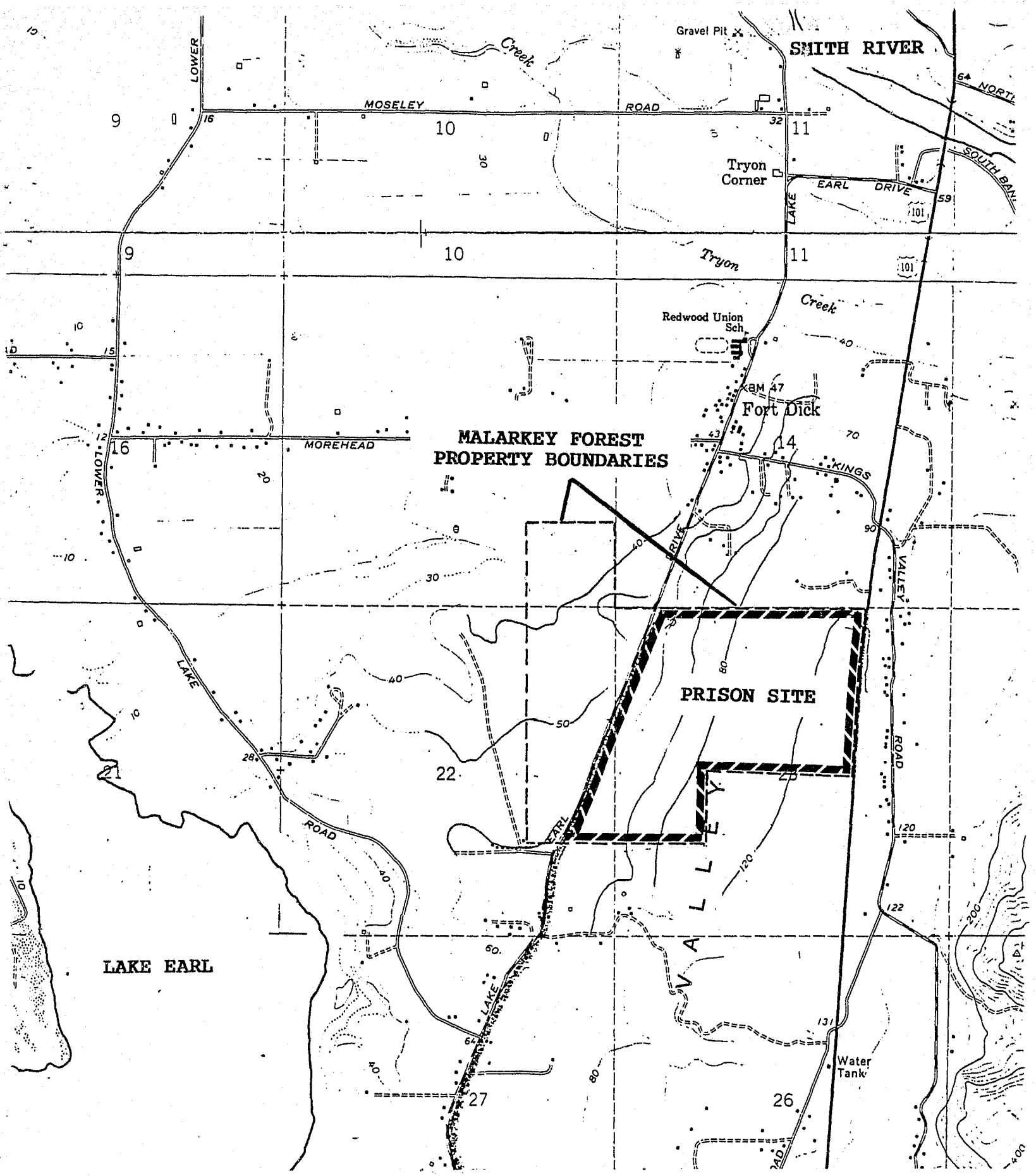
VICINITY MAP



LOCATION MAP

FIGURE 1

REGIONAL PROJECT MAP



CALIFORNIA STATE PRISON
DEL NORTE COUNTY

FIGURE 2

MALARKEY FOREST PROJECT SITE MAP

Based upon projections of future inmate populations and Department experience, the likely long-range inmate level for this facility is approximately 2,600 inmates or 120 percent of design capacity. Operation of this prison at this level allows for better utilization of space without seriously compromising the prison's operational capabilities.

Prison Staffing

If the proposed prison were operated at the 120 percent of design occupancy level, the proposed State prison would employ approximately 1,300 full-time staff. This estimate includes correctional officers and the administrative, support, and prison industries staff that would be needed to operate this facility. This estimate also includes relief staff used during employee absences for sick leave, vacation, training, etc. At the maximum overcrowding level of 190 percent of design occupancy, the facility would employ approximately 1,570 staff.

Since the prison will be operated continuously, staff will be distributed among three eight-hour shifts (or watches) per day, seven days a week. In a typical 24-hour period with the prison operating at 120 percent of design occupancy, about 970 staff will work the day shift from 7:00 a.m. to 3:00 p.m. (second watch). About 180 staff will work the shift from 3:00 p.m. to 11:00 p.m. (third watch) and 110 will work from 11:00 p.m. to 7:00 a.m. (first watch). The Prison Industries Authority (PIA) programs will employ approximately 80 persons, who will generally work the day shift from 7:30 a.m. to 3:30 p.m. Administrative and other ancillary staff, which are included in the total for the second watch above, generally work during the day shift from 8:00 a.m. to 4:15 p.m. Prison staffing levels, especially during the second watch, are generally lower on weekends.

Prison Design and Security

The proposed prison would be designed so that the Level IV housing area is separated from the SHU housing area. Each side would share the use of some central facilities, such as kitchens and health facilities.

The Level IV and SHU facilities and accompanying program and support services buildings will be surrounded by 2 parallel 12 foot chain link fences. Each

fence would be topped with breakaway extension arms topped with barbed tape wire and other security measures. The 2 security fences are spaced approximately 20 feet apart. The Level I support facility would be located outside the secure perimeter. This facility is surrounded by a single security fence.

A security zone called a "no man's land", which is never less than 50 feet wide, will be located on the inside edge of the double-fenced security perimeter. The maximum security perimeter would include an electronic detection system sensing intrusions into the zone at or near the fence. This system alerts staff in central control and the nearby towers to the location of the intruder.

Armed perimeter towers will be located along the outside of the security perimeter. These towers will be approximately 35 feet high and approximately 700 feet apart. These towers would be occupied by armed correctional officers on a 24 hour per day basis. Perimeter towers will be oriented to provide straight lines of sight between adjacent towers. A clear zone approximately 300 feet wide will be provided around the outside of the institution's fences to assure visibility of the perimeter areas. A 25 foot buffer zone of existing trees and shrubs will be maintained around the entire property boundary.

Prison Operation

The proposed prison will be largely self-sufficient, having its own fire station, health care facilities, laundry, and maintenance shops. Mutual aid agreements with local law enforcement agencies, hospitals, and fire departments will be negotiated by the Department of Corrections. As with other correctional institutions, the Del Norte State Prison will rely on nearby communities such as Crescent City for a variety of locally available goods and services. State prisons typically spend from $1-2 million of their yearly budgets on locally purchased goods and services.

Inmate Programs

There will be work, academic, or vocational program opportunities for all inmates. Prison industries that have been tentatively planned for this

proposed State prison include: boot and shoe manufacturing, an optical laboratory, laundry, administration, maintenance shops, and warehousing operations. The vocational programs that are planned for this facility include such activities as: dry cleaning, shoe repair, landscape maintenance, graphic arts, carpentry, and auto body and fender repair.

Only the minimum security (Level I) inmates are allowed to participate in work activities that occur outside of the perimeter fence, such as facility warehouses and maintenance shops. The work of Level I inmates is always supervised by prison staff. Level IV inmates are not allowed outside of the perimeter fence for any reason. Inmates in SHU housing do not participate in training or work programs outside their cells.

Visitation

Visiting hours and days will be established that enable all inmates to receive visitors without interfering with participation in the work and training programs and other activities. Visiting days will generally include both days on the weekend and three weekdays. Based upon operations at other State prisons, the Department anticipates that this facility will receive between 250 and 500 visitors per day depending upon the prison's inmate population.

Parking areas for the anticipated number of visitors (and staff) will be provided by the Department on the prison grounds.

A building site will be identified for a Visitor Center. It will be located within a reasonable distance of the Visitor Processing Center, but away from the main flow of the institution. The Center will be operated by a private, nonprofit agency. The Visitor Center provides inmate visitor services such as a day care center and transportation assistance.

Construction Costs

Total project costs are currently estimated to be $233 million. Construction costs are based on current prices escalated 6 percent for inflation to the estimated midpoint of construction (September 1988). Costs include an allowance for location, design and construction contingency. Location allowances include such factors as sources of labor, subsistence, and

transportation of materials costs. The site location factor for the Crescent City area is estimated to be up to 10 percent of the total project construction costs.

Construction/Occupation Schedule

The initial construction phase for proposed State prison in Del Norte County is planned to begin in spring 1987. The prison will be occupied in phases as each cluster of housing units is completed. The Department anticipates that this institution will be fully operational in approximately two and a half to three years after the start of construction.

A. INTRODUCTION

General Site Characteristics

Project Site

The proposed project site consists of an approximately 430 acre parcel located 7.4 miles northeast of Crescent City and 0.8 miles south of the community of Fort Dick. See Figures 1 and 2 for regional and site maps of the project area. The area that will be used for the proposed project is the portion of this parcel that is situated between Lake Earl Drive and U.S. Highway 101. This portion of the subject parcel covers approximately 260 acres. The entire Malarkey Forest parcel is presently in private ownership.

Existing land use on the Malarkey Forest site consists of logged forest land. The project lies entirely within the unincorporated area of the County of Del Norte. The portion of the parcel that is west of Lake Earl Drive is within the jurisdiction of the Coastal Zone. At the present time, the Department has no development plans for this approximately 170 acre portion of the Malarkey Forest parcel.

The topography of the project area ranges from nearly flat to gently sloping. Site elevations range from about 125 feet along the eastern side of the parcel to about 55 feet on the western side. A shallow intermittent stream appears to originate near the center of the site and flows in a northwesterly direction. There are no perennial streams on the project site. The project site is outside of the 100-year floodplain for the local coastal areas.

The northwestern portion of California is generally classified as having a marine climate. The temperature regime along the coast is modified by the Pacific Ocean, resulting in cool winters and warm summers with little diurnal or seasonal variation. Average temperatures in the project area range from lows in the mid-30's (F) to highs in the mid-60's. The average annual rainfall for the project site is approximately 85 inches. The majority of the

rainfall (75 percent) received in the project area occurs from November through March. Coastal fog is common in North Coast areas during the late spring and summer.

Vegetation on the project site consists of second growth redwoods, other young conifers, and low brush. Although some mature stands of timber still remain in the project area, the majority of the old growth timber on the Malarkey Forest parcel has been removed by previous logging activities. The previous logging operations have resulted in heavy concentrations of slash piles, stumps, and disturbed areas (skid roads, loading areas, etc.). No State or federally listed threatened or endangered plant or animal species are reported to occur on the Malarkey Forest site.

Land Use

Land adjacent to the project area consists of forest, coastal wetlands, agriculture, and rural residential development. As noted above, the small community of Fort Dick is approximately one mile north of the site. The Smith River, the major drainage in the region, passes approximately two miles north of the project site.

The Del Norte County General Plan designates the project area as forestry. Lands immediately adjacent to the project area are designated as forestry and low-density rural residential.

There are no federal, State, or local park lands located in the immediate vicinity of the project site. Lake Earl, a large area of coastal wetlands and open lake, is approximately one mile southwest of the Malarkey Forest parcel.

Project Analysis

The evaluation of the direct, off-site environmental effects of this project are based upon a worst-case analysis of the proposed prison operating at 190 percent of design occupancy (4,000 inmates). However, the Department notes that in the long term this prison will probably be operated at a lower level of approximately 120 percent of design occupancy or 2,600 inmates.

The description of the environmental setting generally concentrates on the eastern portion of the Malarkey Forest parcel that has been identified as the prison site. This is the portion of the parcel that lies between Lake Earl Drive and U.S. Highway 101.

B. GEOLOGY

ENVIRONMENTAL SETTING

Regional Geological Setting

The Del Norte County area can be divided into two major topographical regions: an extensive eastern mountainous area, consisting of the Northern Coastal Ranges and the Klamath Mountains and a smaller area of coastal lowland extending from south of Crescent City northward to the Oregon border. The wide, lowland area is called the Smith River Plain. This area encompasses approximately 110 square miles. The Malarkey Forest site is situated on the eastern edge of the Smith River Plain.R-1/

The geological record of this region indicates that during the Miocene Period (approximately 25 million years ago), the Coastal Range slowly subsided into the Pacific Ocean. The Smith River, which was flowing across this area, subsequently deposited sediment into this slowly forming depression. These sediments were reworked and transported within this region by ocean wave action and near shore currents. These processes formed a relatively smooth oceanic terrain that was eventually uplifted during geologically recent times above sea level.

The resulting coastal platform, or Smith River Plain, is covered with two major geologic formations. The first, which was deposited during the Pliocene, is about 350 to 400 feet thick and is mainly composed of fine grained sediments. The St. George Formation is described as massive, poorly bedded marine siltstone and shale with thin beds of sand and scattered gravels.

The second formation on the Smith River Plain is the Battery Formation. This Pleistocene-aged formation overlies the St. George Formation. The Battery Formation is approximately 35 feet thick and is described as marine terrace and sand dune deposits overlying an abrasion platform. It consists of unconsolidated medium-grained quartz sands alternating with silty clay and imbricated gravels.

The mountainous areas to the east of the Smith River Plain predominantly consist of sandstone (greywacke variety) and shale of the Franciscan Complex, which is locally referred to as the Franciscan Broken Formation. This complex is an intensely sheared and displaced assemblage of mainly marine rocks deposited during the Cretaceous-Jurassic periods (90 to 145 million years ago). The presence of numerous shear zones and abundant shales combined with the high rainfall of the North Coast region results in serious slope stability problems in Franciscan formations.

Between the base of the mountains and the Smith River Plain are areas of alluvial fan and/or colluvial slope deposits. These deposits, which are formed from erosion of the adjacent mountains are comprised of angular sandstone and shale fragments supported in a silty clay matrix. These deposits are also subject to some soil instability problems.

Historical records of earthquakes in the Del Norte County area indicate that very few earthquakes have occurred within the County. However, the County does border on seismically active offshore areas to the west and southwest in the Pacific Ocean. The faults that would be expected to potentially have the most effect on site development are the Del Norte Fault and the Grogan Fault.

There is no recorded seismic activity on the Del Norte Fault. This fault was first postulated in the early 1930's based upon surface geology in this area. The fault is a north-south oriented feature that is situated east of Crescent City near the base of the surrounding mountains and the Smith River Plain.

Geologic investigations of the Del Norte Fault were performed on the Stary Ranch site. These studies did not provide data to support the existence of this fault. However, further studies would be needed to prove beyond any doubt that there is no fault in this area.

The conclusion that there is a significant question if the Del Norte Fault does exist is based upon several geological observations. For example, using subsurface and seismic refraction data, it was evident that there is no significant discontinuity in the underlying Franciscan bedrock near the base of the mountains and the coastal plain. The data indicated a subsurface profile consistent with a ocean wave generated erosional front along the base

of the hills rather than a thrust fault. Other data that supports this conclusion is that a surface deposit east of this feature was misclassified as Battery Formation, which occurs on the plain to the west, instead of Wimer Formation, which is common in the adjacent mountains.

The Grogan Fault is part of a fault zone situated approximately 15 miles west-southwest of the Malarkey Forest site. This offshore fault is considered active with a maximum credible earthquake of 6.5 on the Richter scale. A maximum seismic event on the Grogan Fault would be expected to generate a bedrock acceleration beneath the project site of 0.20 g.

Project Site Geology

The surface geology of the Malarkey Forest site is generally composed of Battery Formation. The exception to this is the more recent alluvial deposits that occur in the shallow, intermittent stream channels that drain the site. The thickness of the Battery Formation material is generally in excess of 25 feet over the entire site. Based upon deeper drill hole data, the site is generally underlain at depth (30-70 feet) with Franciscan Broken Formation bedrock.

The surface of the site is relatively level to gently sloping except near its center where slopes increase for a short distance to approximately 10 percent. No surface faults are reported to occur on or immediately adjacent to the project site. An area of high ground on the eastern side of the site was investigated because of concern that it could represent a subsurface fold. Based upon subsequent geological studies, it was determined that this topographic feature is related to depositional or erosional factors rather than bedrock distortion due to thrust faulting.

Two soils occur on the project site. The predominate soil type is Timmons Loam, a deep, well drained, fine grained soil that develops on alluvium from old marine terraces and sedimentary rock alluvium. This soil has a moderate permeability.

The other soil type is Talawa Fine Sandy Loam. This poorly drained soil exhibits minimal profile development, generally occurring in drainage areas.

A small area of this soil type occurs in the southern portion of the subject parcel. Surface soils on the project site have been disturbed by past logging activities.

Subsurface soils on the Malarkey Forest site generally consist of a upper stratum of clayey silt two to seven feet thick underlain by a silty or clayey sand. Below this layer are alternating stratified layers of clean sand, silty sand, clayey sand, and gravels. These soils extend to depths of approximately 30-70 feet before encountering bedrock. Density of these soils range from loose to dense. Groundwater was encountered in on-site soil borings from 5 to 26 feet (June 1986). No expansive soils were encountered on the project site.

The saturated clean sands that occur beneath the site may be subject to liquefaction during major seismic events originating in the Del Norte area. Liquefaction is the transformation during an earthquake of a stable granular material, such as saturated sand layers, into a fluid-like state than can cause buildings and other structures to sink into their foundation soils. The potential for liquefaction is common to a large portion of the Crescent City area. However, because of such factors as the thickness of the saturated sand layers, the depth to bedrock beneath the site, and the nature of the prison's structures, the potential for liquefaction is not considered to pose a substantial design problem.R-2/

ENVIRONMENTAL EFFECTS

Strong Ground Motion

The nearest source of a major earthquake that could damage the proposed prison is the Grogan Fault, which passes approximately 15 miles west of the project site. Because there are no known surface faults on or immediately adjacent to the project site, no surface ruptures would be expected from a major earthquake on the Grogan Fault.

The prison facilities will be designed and constructed to ensure that critical structures, such as the housing units, the security system, and other necessary facilities, can withstand the effects of the maximum credible

earthquake from the nearest fault. The specific critical structures to be protected from severe damage are identified during the final design of the facility.

Liquefaction Potential

Because of the presence of shallow layers of saturated clean sands beneath the building area, critical prison buildings and structures will be designed and constructed to withstand the potential effects of liquefaction resulting from a major earthquake.

The specific buildings and structures to be protected, as well as the particular type of foundation, will be identified during the final design of the proposed prison. Possible methods of minimizing liquefaction-induced subsidence include, but are not limited to, using deep pilings under building foundations, excavation and recompaction of the underlying material, and increasing foundation strength. Because of the variety of buildings and structures on the prison site, the foundation designs will actually vary to some degree from structure to structure. Final design of these foundations may require some limited additional geotechnical investigations such as more or deeper soil borings.

Earthquake-Induced Flooding

No dams or canals are located in areas upstream of the project site so earthquake-induced flooding is not a hazard in this area. The project site is also not in an area that could be inundated by a tidal wave.

Slope Instability

No areas of unstable slopes exist on or immediately adjacent to the project site.

Construction-Related Effects

Construction of the proposed prison will require the clearing and grubbing of a large portion of the project site. It is anticipated that the majority of the site can be graded using conventional earthmoving equipment because of the generally unconsolidated nature of the surface soils. The stumps that remain

from previous logging operations will be cleared using heavy equipment and disposed of properly. The clearing and grading required for foundation construction is not expected to generate any significant off-site geological impacts.

The surface soils on the project site have a low to moderate potential for erosion. To prevent increases in surface erosion from the project site, the Department will require its contractors to install appropriate drainage controls during construction of the prison.

Deeper foundation excavations may encounter areas of shallow groundwater that are known to occur on the project area. If dewatering of such areas is necessary, the Department will require its contractors to direct such water to detention basins before it is discharged from the site to prevent erosion and sedimentation of adjacent waterways.

Direct, Off-Site Effects

The proposed project is not expected to have any direct, off-site effects on the geology of the lands surrounding the Malarkey Forest area.

MITIGATION MEASURES

The proposed project will not have a direct, off-site effect on the geology of the project area, so no mitigation measures are necessary.

Because of a moderate potential for liquefaction of foundation soils, the proposed project will be designed and constructed to minimize the effects of such an event on critical buildings and structures at the prison. The prison will also be designed and constructed to withstand the effects of large earthquakes that could occur in the North Coast region.

GEOLOGY REFERENCES

R-1/ Information in this section is taken from a study by J. H. Kleinfelder and Associates, Final Geotechnical and Geological Report, Technical Site Suitability Study of Two Proposed Prison Sites, California state Prison, Del Norte County, July 28, 1986, a second study by J. H. Kleinfelder and Associates, Report of Additional Geological and Geophysical Investigations, Technical Site Suitability Study of Two Proposed Prison Sites, California State Prison, Del Norte County, August 21, 1986, or from a study by Nolte and Associates, Technical Reports for the EAS, Proposed State Prison in Del Norte County, July 1986.

R-2/ Ray Costa, J. H. Kleinfelder and Associates, personal communication, September 12, 1986.

C. HYDROLOGY*

ENVIRONMENTAL SETTING

Surface Water

No lakes or perennial streams exist on the Malarkey Forest site. However, after periods of heavy rainfall, shallow (less than one foot deep) puddles will form over a large portion of the site in the many depressions that have been left by previous logging operations. These puddles appear to perch on the relatively slow draining soils of the site. Because of the low slope of the project site, its generally poor drainage, and the high rainfall common to the North Coast region, portions of the site become quite marshy during the winter, spring, and early summer.R-1/

The general drainage of the project site is towards the northwest. The drainage basin of the project area originates on the eastern boundary of the site near U.S. Highway 101. This divide in the drainage serves to limit runoff onto the site from adjacent lands. Two small channels presently drain the site. Approximately 90 percent of the runoff from the project area either drains directly off the site towards Lake Earl Drive or to a shallow channel that crosses the north central portion of the parcel. The remainder of the runoff flows to a small drainage along the southern edge of the parcel.

At the western edge of the project area runoff from the site passes under Lake Earl Drive through 10 existing (24- to 36-inch) culverts. Site runoff continues towards the northwest through two small drainage channels for approximately a mile and a half before entering Lake Earl. The existing peak 100-year discharge from the site is approximately 250 cubic feet per second (cfs).

The Malarkey Forest site is out of the 100-year floodplain for Lake Earl and the Smith River. See Figure C-1 for the boundaries of the 100-year floodplain and the drainage area of the Malarkey Forest site.

---

*This section of the EAS covers general hydrological issues such as: flooding, surface water, groundwater, and water quality. The sources of drinking water for the proposed prison are discussed in Section H. Utilities, 6. Drinking Water. The prison's wastewater treatment system is addressed in Section H. Utilities, 5. Sewage Disposal.

The quality of the surface runoff from the project site is typical of springs and first-order tributaries in the Del Norte area. The water contains levels of iron (9.4 milligrams per liter or mg/l) that exceed the California secondary drinking standards and levels of chromium (0.007 mg/l) that approach the primary standards.

Because of the large amount of disturbed area on the project site, runoff values for suspended particles would be expected to be high during periods of heavy rainfall. However, water samples taken during June 1986, demonstrated low values (5-7 nephelometric turbidity units or NTU) for turbidity in both of the on-site drainage channels. These values probably are a result of the very low flows that occur in these channels (less than 1.0 cfs) during the summertime and the marshy nature of the drainage system that tends to trap sediments.

Dissolved oxygen levels were 7.8 mg/l for the north drainage and 6.9 mg/l for the south drainage. These levels could be expected to affect certain aquatic species such as trout and other fish. These levels are considered to result from the low flows in these drainages and the high water temperatures that typically occur in the open channels. Surface waters on the Malarkey Forest site were also slightly acidic (pH = 6.3 to 6.5) and discolored indicating a leaching of tannins from the trees and slash piles.

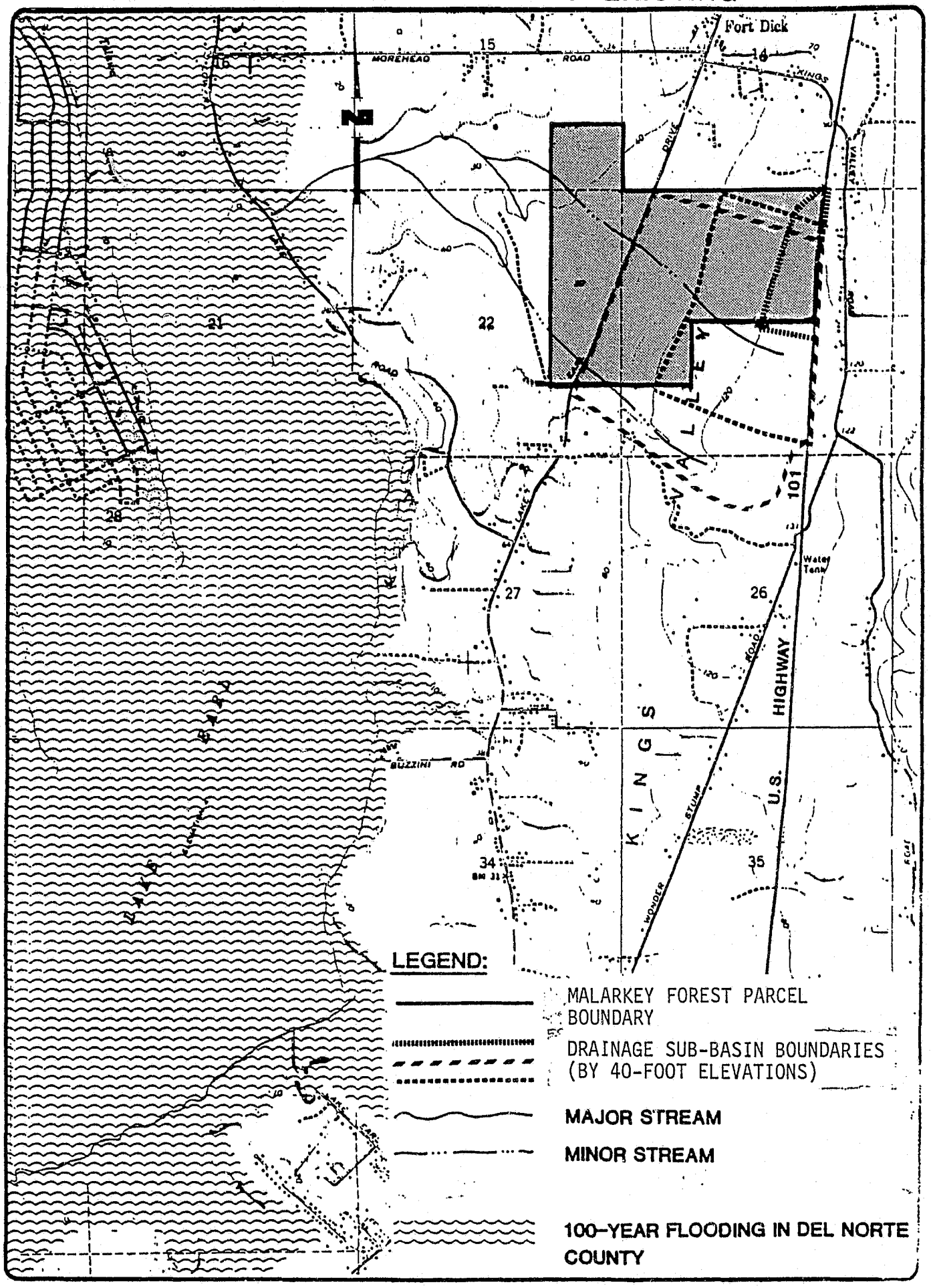
Groundwater

Groundwater is present beneath the project site, primarily in the more unconsolidated Battery Formation. A typical section of this formation consists of lenticular, poorly stratified beds of silty sand and interbedded clay layers. This aquifer extends throughout a large portion of the Smith River Plain. The thickness of this aquifer ranges from about 30 to 70 feet. Depth to groundwater on the site ranges from approximately 5 to 26 feet. Groundwater movement is generally from east to west in the project area.

Because of the shallow thickness of the Battery Formation aquifers, water quality in the project area is subject to varying degrees of impairment. For

MALARKEY FOREST SITE DRAINAGE AREAS -EXISTING

FIGURE C-1



GEORGE S. NOLTE AND ASSOCIATES

example, groundwater in the general vicinity of the project area could potentially be effected by coliform contamination from domestic leach fields. Poor subsurface drainage also contributes to declining groundwater quality.

Because of the relatively small volume of drinking water that would be available from the Battery Formation, concerns about water quality, and the distance to adjacent domestic wells, the Department is not considering the use of groundwater to supply the drinking water needs of the proposed prison.

ENVIRONMENTAL EFFECTS

Surface Water

Construction of the proposed prison will require clearing and grading approximately 240 or more acres of the project area. Based upon preliminary plans, a narrow buffer zone of existing vegetation will be left around the perimeter of the parcel. Building and parking areas, which will generally be impervious, will cover approximately 100 acres. The remainder of the site will be cleared but left in open space as a clear zone around the secure perimeter.

If not controlled, runoff from the entire developed prison site during a 100-year storm event could increase by as much as 64 percent (or 408 cubic feet per second) because of removing existing vegetation and slash that presently allows for greater rates of rainfall infiltration. The peak runoff would also occur more quickly because of the mostly impervious surface of the developed area. Increased site runoff could also cause erosion and/or sedimentation in the drainage channels that direct this water to Lake Earl.

Water Quality

Clearing of the project site and construction of the proposed prison could also change the quality of surface waters discharging from the Malarkey Forest parcel. For example, once the site is cleared, surface erosion could increase the amount of suspended sediment and turbidity of the runoff waters. This sediment would be carried off the site to Lake Earl.

Because of the loss of vegetation and the developed nature of the prison facility, other changes that could occur in the quality of waters leaving the site include potentially higher biological oxygen demand and increased levels of contaminants such as nitrogen, phosphates, lead, and oil.

However, except for suspended solids, the effects of these increases are not expected to be significant because of several factors: (1) The prison itself does not contain any heavy industries that will emit large quantities of pollutants; (2) the amount of parking areas at the prison will be minimal (approximately 10-20 acres); (3) the facility will be served by a wastewater treatment plant; and (4) the size of the drainage area of the prison (0.8 square miles) is relatively small as compared to that of Lake Earl (32 square miles), therefore a substantial amount of dilution would occur as site drainage reaches this much larger body of water.

In regard to wastewater, the Department has no plans to discharge effluent from the prison's wastewater treatment system to any on-site or adjacent drainage or directly to Lake Earl. Any wastewater that is treated at the prison or stored until it is discharged elsewhere will be contained so that it does not effect the quality of waters running off the site or entering the groundwater. See Section H. Utilities, 5. Sewage Disposal for a description of the Department's plans for wastewater treatment and disposal.

MITIGATION MEASURES

Surface Runoff

The project site will be provided with a drainage system that will control site runoff and the surface erosion. The proposed facility will be designed and constructed so that runoff is directed to surface drains extending along the north and south side of the project area. These drains will direct site runoff to a large detention pond that will be constructed along the western side of the site adjacent to Lake Earl Drive. The release of storm water runoff from this system will be controlled such that peak flows to each of the existing culverts under Lake Earl Drive will not exceed the peak flows under present conditions during a 100-year flood event. Based upon preliminary estimates, this system will have a design capacity of approximately 35 acre-feet. This system will utilize grass-lined perimeter ditches and basins. The

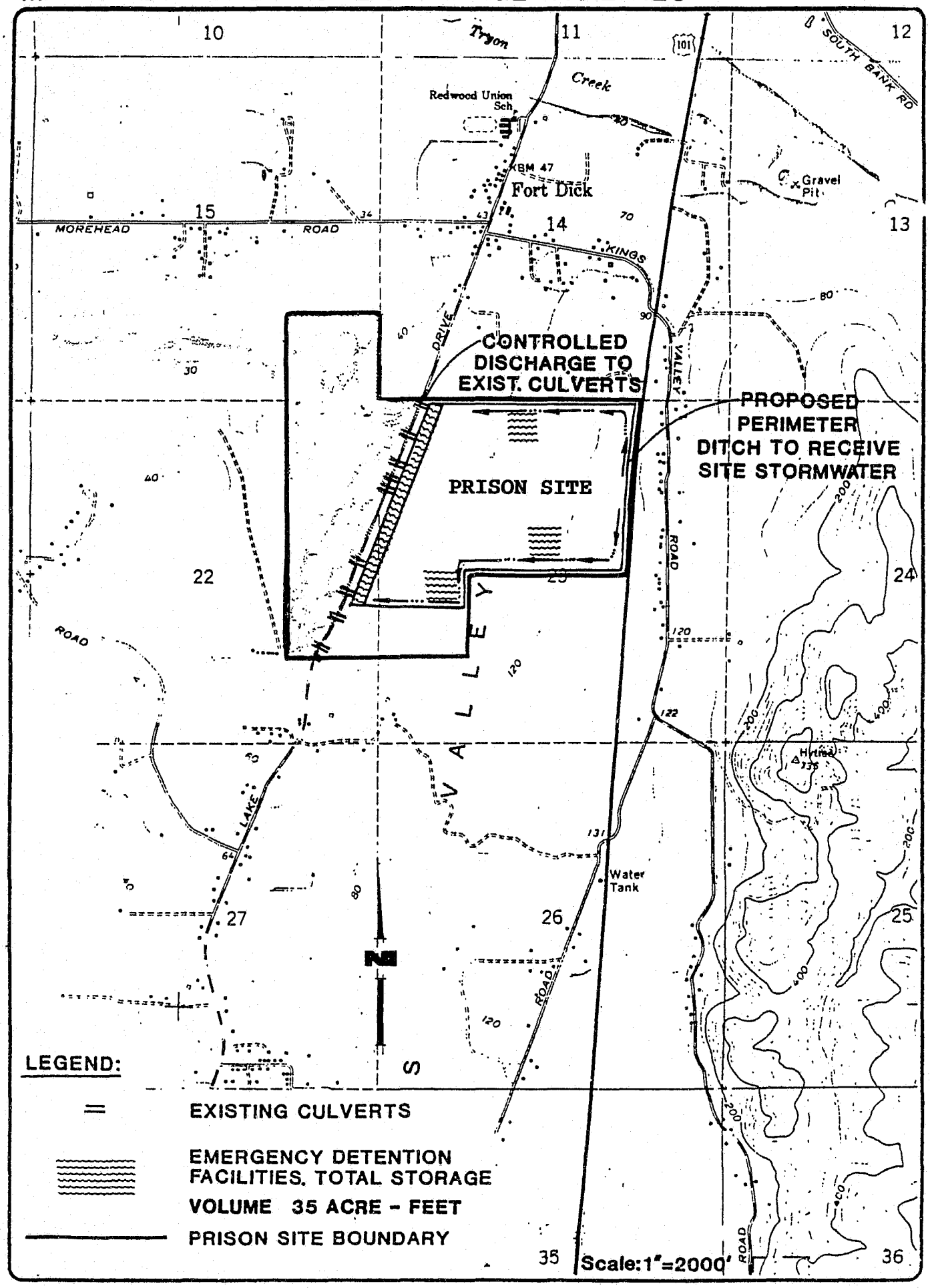
holding basins will be designed so that they do not intersect the shallow groundwater found on the site. The proposed drainage system is displayed on Figure C-2. Use of the detention system will prevent flooding of lands downstream of the site and erosion of off-site drainage channels. The use of this system is also expected to significantly reduce the amount of sediment that could potentially be discharged to Lake Earl. Because of the present disturbed nature of the site, there actually may be a reduction in sediment levels discharging from this property once the prison is constructed. Other measures the Department will take to reduce sedimentation include vegetation of unpaved areas with appropriate plants or grasses, proper maintenance of the drainage ditches, and retention of a buffer zone of native vegetation around the site.

To mitigate the potential for soil erosion during construction of this facility, the Department will require that areas of bare soil will be seeded and mulched prior to the rainy season. Other erosion control measures the Department will require include construction of temporary sedimentation/detention basins and the use of hay bales (or similar measures) at drainage outlets.

Because of these measures no significant off-site flooding, sedimentation, or water quality effects are anticipated to result from the construction of the proposed prison.

MALARKEY FOREST SITE DRAINAGE FACILITIES

FIGURE C-2



GEORGE S. NOLTE AND ASSOCIATES

HYDROLOGY REFERENCES

R-1/ Information in this section is taken from a study by J. H. Kleinfelder and Associates, Final Geotechnical and Geological Report, Technical Site Suitability Study of Two Proposed Prison Sites, California State Prison, Del Norte County, July 28, 1986 or from a study by Nolte and Associate, Technical Reports for the EAS, Proposed State Prison in Del Norte County, July 1986.

D. PLANT AND ANIMAL LIFE

ENVIRONMENTAL SETTING

Project Site

The principal plant community in the study area is coast redwood forest. However, the natural vegetation on the Malarkey Forest parcel has been heavily disturbed by past logging activities, particularly in the harvesting of the larger old-growth redwood trees. Much of the site is covered with large redwood stumps, slash piles, and heavy equipment skid trails. Although some large trees are still present on the site, the existing vegetation predominantly consists of young second-growth redwoods (Sequoia sempervirens), spruce (Picea sitchensis), and pine (Pinus radiata x attenuata). A bushy understory composed of such plants as huckleberry (Vaccinium ovatum), cascara (Rhamnus purshiana), blackberry (Rubus sp.), and sword ferns (Polystichum munitum) is common on much of the site.R-1/

Because of poor drainage, the lower lying areas of the site also support plant species common to marsh or riparian type vegetation. These plants include such species as red alder (Alus rubra), spiraea (Spiraea douglasii), sedges (Carex obnupta and others), rushes (Juncus bufonius), horsetail (Equisetum telmateia), and skunk cabbage (Lysichiton americanum). Other plant species found in this area include trailing black currant (Ribes laxiflorum) and tules (Typha sp.). (A complete list of the plants observed on the project site is provided in Appendix 1.) No threatened or endangered plant species are reported to occur on this parcel by the California Department of Fish and Game Natural Diversity Data Base or other individuals that were familiar with this area.R-2/

Drainage from the property is very poor due to the low slope of the property, the rutted nature of its surface, and logging debris. Although some areas are quite marshy, there are no perennial lakes or streams on the property. It is expected that the marshy areas probably dry out by the end of summer during most years. The site is drained by two shallow channels that trend towards the northwest side of the parcel, eventually draining to Lake Earl. None of

the aquatic habitat on the Malarkey Forest parcel supports populations of fish, however, the marshy areas do provide habitat for amphibians such as Pacific tree frogs.

While situated near urban development, the project area would be expected to support a number of wildlife species common to the coastal redwood forests of the North Coast region. These species include gray fox, black-tailed deer, brush rabbit, coyote, black bear, and stripped skunk. This parcel is also expected to support several bird species such as red-shouldered hawk, quail, western flycatcher, Stellar's jay, raven, brown creeper, and Wilson's warbler. An osprey nest is reported to exist in an old snag on the western portion of the Malarkey Forest parcel across Lake Earl Drive. However, as was noted earlier, no construction activities are planned for the western portion of the Malarkey Forest parcel. A list of wildlife species that could occur on the project area is provided in Appendix 1. No threatened or endangered wildlife species are reported to occur on this parcel by the California Department of Fish and Game Natural Diversity Data Base or other individuals that were familiar with this area.

Lands adjacent to the proposed prison site generally support similar coastal redwood forest. Some of these lands have also been subject to recent logging. Lands to the north and east of the site contain varying densities of rural residential development although some large areas of forest lands do remain. Approximately one mile west of the project site is Lake Earl, a large coastal wetlands and lake. Lake Earl and some of the other adjacent coastal wetlands and sloughs are known to support populations of the Aleutian Canadian Goose, a federally listed endangered species. Areas such as Lake Earl and Talawa Slough are considered locally important coastal habitats.R-3/

Infiltration Basins

One of the proposed means of disposing of treated wastewater effluent generated by the prison will be to construct a series of rapid infiltration basins on an approximately 30 acre parcel approximately one mile northeast of the project site. Figure D-1 displays the location of this site and the possible corridors for the effluent pipelines.

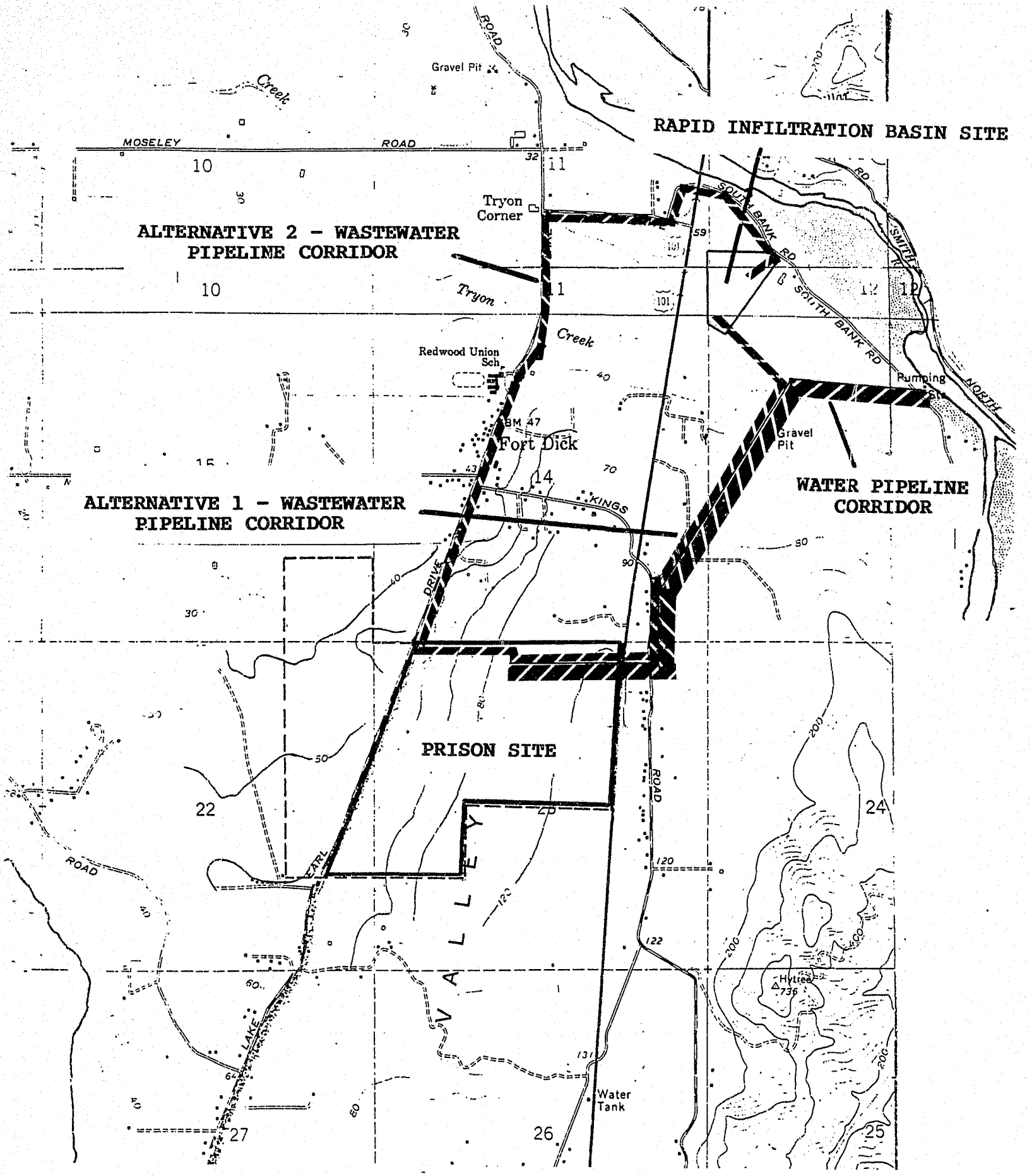


FIGURE D–1

WATER AND WASTEWATER PIPELINE CORRIDORS
AND
RAPID INFILTRATION BASIN SITE

The subject parcel has been used for agricultural purposes (bulb farming) for many years. Lands surrounding this parcel includes other farmland, redwood forest, and the floodplain of the Smith River. An area of riparian vegetation (black cottonwoods, etc.) extends along the northeast side of the parcel. No threatened or endangered plant or animal species are reported to occur on this parcel.

The pipeline corridors leading to this site generally follow existing roadways or other utility corridors. These areas do not contain any sensitive habitats that would be effected by trenching or other temporary construction activities.R-4/

ENVIRONMENTAL EFFECTS

Project Area

The principal effect the proposed project will have on the biological resources of the Malarkey Forest parcel is the loss of open space and natural habitat that will occur with development of this site. The proposed prison will require the clearing of approximately 240 acres of the parcel for the facility and necessary clear zone around the secure perimeter fences. However, since only approximately 100 acres of the cleared 240 acres will actually be developed with buildings or other structures, a large amount of open space will remain on the parcel. Based upon preliminary plans, the Department also intends to leave a buffer zone of existing vegetation around the outside perimeter of the parcel.

Clearing a certain portion of the site and the loss of open space are unavoidable effects of this project. Factors that serve to reduce the significance of this change are: (1) Coniferous forest is a common habitat type in the North Coast region; (2) there will be a large amount of remaining open space in the general project area even with the development of this site; and (3) the Department has no plans at present to develop the remaining 170 acre parcel on the west side of Lake Earl Drive.

Clearing and construction of the proposed prison will result in a change in both the amount and potentially the quality of the water that runs off the project site. Because of the poor drainage and disturbed nature of the

project area, the site is presently subject to surface erosion and ponding. However, a significant amount of rainfall infiltration does probably occur on this site at present because of its rutted, bushy surface condition.

To prevent the increased potential for downstream sedimentation, channel scour, and flooding, the Department will use a runoff detention system that controls the release of waters from the site. Runoff will be directed to this system through grass-lined perimeter ditches around the perimeter of the property. Areas of bare soil will be vegetated with appropriate native grasses or other plants to reduce surface erosion. The detention system will be sized to maintain the same peak flows as presently occur on the site. Channel scour should not occur in channels that drain to Lake Earl.

Use of the detention system and development of the property should reduce the amount of sediment that is presently eroding from the property. Because of the non-industrialized nature of the prison operation and the use of a conventional wastewater treatment system, significant quantities of other pollutants should not enter the waters leaving the site.

The proposed project is expected to generally have a low to moderate effect on biological resources that occur immediately adjacent to the site. For example, the physical presence of the prison will prevent some adjacent wildlife habitat from being used to the same degree that it is at present. However, because of the contained, institutional nature of a prison operation and the buffer zone that will be provided around the property these changes should be minimal. It should also be noted that the value of the habitat adjacent to the east and west sides of the site is already somewhat limited by existing roads and rural residential areas.

Additional operational factors that could affect the value of adjacent habitat include the use of the rifle range and prison perimeter lighting.

Based upon preliminary plans, a small facility rifle range will be located in the southwest corner of the project site. Prison rifle ranges are generally used approximately 15 to 20 days per month for officer training programs, including some night firing. All range use is under the direct supervision of range control officer. No shooting out of the range is allowed under any conditions. The range will be provided with a safety berm. During use of the

range it could be expected that more mobile animal species would move away from lands bordering this corner of the prison site. Because of the presence of Lake Earl Drive and the remaining vegetation buffer, the range is expected to have only a minor effect on wildlife.

As noted in Section G., the proposed facility will be a new source of night light in the Fort Dick area. The illumination of the prison grounds and a perimeter area is unavoidable because of the facility's security requirements. However, perimeter lights are designed to directly illuminate only a small area outside of the security fence. It is not the intent of these lights to directly illuminate lands several hundred feet from the prison's boundaries. While spot lights are provided on each perimeter tower, they are only used on an occasional basis.

Perimeter lighting from the prison could be expected to affect the use of the area by some sensitive species, particularly during the early phases of prison occupation. This effect is not expected to be significant because of the inwardly directed nature of the facility's lighting system, and the buffer zone of existing vegetation that will be left around the property. Because of the general absence of people outside of the prison at night, there is a strong likelihood that many species will eventually become accustomed to the prison's perimeter lighting.

Because of the distance of the project from Lake Earl, its proposed drainage controls, and the moderate size of this development, the project is not expected to have any significant effect on this important wetland habitat.

Infiltration Basins

Construction of the rapid infiltration ponds would result in the conversion of a small parcel of farmland to a partially developed use. Because of the relatively small area these ponds will cover, their remaining open space quality, and the operational controls that must be met by the Department, the construction of these ponds is not expected to have a significant effect on biological resources on or near the site of these ponds.

Trenching and grading activities related to the installation of wastewater interceptors or water lines are also not expected to have a significant effect on any biological resources.

MITIGATION MEASURES

There are no feasible mitigation measures available to completely eliminate to the biological resource effects of this project. The loss of open space, while of only moderate significance, is an unavoidable effect of the project. Other measures, such as the maintenance of a buffer zone of native vegetation and revegetation of open space areas, have been designed into the project, so they are not considered mitigation measures.

PLANT AND ANIMAL LIFE REFERENCES

R-1/ Information in this section was primarily taken from a biological survey prepared by J. O. Sawyer, Jr., T. Duebendorfer, K. Berg, and G. Lester, Field Survey of Malarkey Forest, Del Norte County, California, June 15, 1986, Department of Biology, Humboldt State University and from a study prepared by Nolte and Associates, Final Technical Reports for the EAS, Proposed State Prison - Del Norte County, July 1986.

R-2/ Letter from the Department of Fish and Game, Natural Diversity Data Base to Roxane Dal Porto, Department of General Services, February 22, 1985.

R-3/ Personal communication, Ernie Pierce, California Department of Fish and Game, November 4, 1986.

R-4/ Personal communication, John O. Sawyer, Department of Biology, Humboldt State University, November 3, 1986, concerning the results of the biological survey of the rapid infiltration site and associated pipeline corridors.

E. AIR QUALITY

ENVIRONMENTAL SETTING

Air quality management is guided by several State and federal laws, the most important of which is the Federal Clean Air Act. This act establishes a national program to maintain standards of air quality throughout the nation. Pursuant to this law, the Environmental Protection Agency promulgated the national Ambient Air Quality Standards (NAAQS) for those pollutants of health concern. In addition, the State of California has air quality standards that are generally more stringent than the federal standards. The State and federal standards are listed in Table E-1.R-1/

The Clean Air Act requires each state to identify and designate any area within its boundary that is shown by monitored data or that has been calculated by air quality modeling to exceed the NAAQS. Areas so designated are known as "nonattainment" areas. Areas where the NAAQS are being met are known at "attainment" areas.

Attainment areas are designated in one of three classes. Specified increments of net air pollution increases are permitted in each class. Class I increments are the most stringent while Class III increments are the least stringent.

The Malarkey Forest site lies within the North Coast Air Basin, a sparsely settled mountainous region that includes the counties of Del Norte, Humboldt, Trinity, Mendocino, and the northern portion of Sonoma County. The counties of Del Norte, Humboldt, and Trinity operate as a single unified special district agency. The North Coast Unified Air Quality Management District (AQMD) has permitting authority for the construction and operation of major stationary sources of air pollution.

The entire North Coast Air Basin has been designated as attainment or unclassified for all criteria pollutants and is subject to Prevention of Significant Deterioration (PSD) [major new or modified sources of air pollution] procedures. All of Del Norte County, except the Redwood National

TABLE E-1

AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California	National	
			Primary	Secondary
Oxidant	1 hour	0.10 ppm (200 ug/m^3)	-	-
Ozone O_3	1 hour	-	0.12 ppm (235 ug/m^3)	0.12 ppm (235 ug/m^3)
Carbon Monoxide CO	8 hour	9.0 ppm (10 mg/m^3)	10 mg/m^3 (9 ppm)	10 mg/m^3 (9 ppm)
	1 hour	20 ppm (23 mg/m^3)	40 mg/m^3 (35 ppm)	40 mg/m^3 (35 ppm)
Nitrogen Dioxide NO_2	Annual Avg.	-	100 ug/m^3 (0.05 ppm)	100 ug/m (0.05 ppm)
	1 hour	0.25 ppm (470 ug/m^3)	-	-
Sulfur Dioxide SO_2	Annual Avg.	-	80 ug/m^3 (0.03 ppm)	-
	24 hour	0.05 ppm (131 ug/m^3)	365 ug/m^3 (0.14 ppm)	-
	3 hour	-	-	1300 ug/m^3 (0.5 ppm)
	1 hour	0.25 ppm (655 ug/m^3)	-	-
Suspended Particulate Matter (PM_{10})	AGM	30 ug/m^3	-	-
	24 hour	50 ug/m^3	-	-
Suspended Particulate Matter	AGM	-	75 ug/m^3	60 ug/m^3
	24 hour	-	260 ug/m^3	150 ug/m^3
Sulfates	24 hour	25 ug/m^3	-	-
Lead Pb	30 day Avg.	1.5 ug/m^3	-	-
	Calendar Quarter	-	1.5 ug/m^3	1.5 ug/m^3
Hydrogen Sulfide	1 hour	0.03 ppm (42 ug/m^3)	-	-
Vinyl Cloride (Chloroethene)	24 hour	0.010 ppm (26 ug/m^3)	-	-
Visibility Reducing Particles	1 observation	Insufficient amount to reduce the prevailing visibility to less than 10 miles when the relative humidity is less than 70%	-	-

Note: AGM = Annual Geometric Mean

Park, has been designated as a Class II area. Redwood National Park, which is located approximately six miles from the project site, is designated as a Class I area.

Air quality monitoring data and updated emission inventories have shown that ambient concentrations of major pollutants, such as carbon monoxide, nitrogen dioxide, sulfur oxides, and ozone are well below both State and federal standards in the North Coast Air Basin. A minor exception to this is for odorous sulfur compounds, such as hydrogen sulfide, which is a localized problem near Eureka and in the geothermal areas of Sonoma County.

The air pollutant of primary concern in the North Coast Air Basin is particulate matter. However, there have been significant reductions in the amount of particulate emissions in the project area in the past several years. For example, particulate emissions have declined by 86 percent in the last 14 years in this basin. This decrease can be attributed to both the institution and enforcement of stringent air pollution control regulations. Control efforts have been especially focused on emissions from tepee burners, steam generators, and wood processing plants.

High-volume air sampling for total suspended particulates was conducted in Crescent City from 1973 to 1978. Monitoring was discontinued after 1978 because the annual geometric mean concentrations were stabilizing at 40 micrograms per cubic meter, which is well below the federal standard of 60 micrograms per cubic meter.

ENVIRONMENTAL EFFECTS

Short-Term

Construction of the proposed prison will result in three types of short-term air quality impacts. The first of these impacts consists of the emissions that will be generated by construction crew traffic, material and equipment transport, and use of construction equipment. These emissions are expected to be minor because of the size of the work crew that will be on the site at any one time and the limited number of tractors (15-30 maximum) that would be used for site clearing and foundation work.

The second potential emission would be from dust generated by grading and clearing activities. This impact is also expected to be minimal because of the relatively moist climate of the project area and the normal dust control measures required on construction sites. If dust does become a problem during periods of dry weather, the Department will require contractors to use additional dust control measures such as extra watering of excavated areas.

The third short-term effect is related to the disposal of the wood waste that will be generated by clearing the Malarkey Forest site. Use of this site will require clearing approximately 240 acres. While the area has been logged previously, the California Department of Forestry has estimated that some parts of the site could produce 500-1,000 tons of wood waste per acre. The site contains, in particular, a significant number of large redwood stumps that must be removed prior to site grading.

At the present time, the Department has not yet selected the exact means of disposing of wood waste cleared from the site. The means of disposal that is being considered is on-site burning or incineration. A portion of the wood waste could also be used as a fuel at the Arcata Lumber Company power plant.

On-site debris burning could be accomplished in a pit using a device called an Air Curtain Destructor. The Air Curtain Destructor is a special high velocity fan system that recirculates the smoke back into the pile of burning debris. This device provides greater combustion efficiency resulting in reduced emissions.

Emission rates for debris burning with the Air Curtain Destructor will be lower (except for nitrogen oxides) than emission rates from open burning of wood waste. Particulate emissions can be expected to be reduced by 50 percent using this system.

Using an Air Curtain Destructor and a single pit, on-site burning could dispose of approximately 300 tons of debris per day. Based upon the estimated amount of debris present on the site, two-five pits would be required to clear the site over a period of five months. If all debris was burned on-site, total particulate emissions would range from approximately 190 to 2,000 tons. (Particulate emissions vary because of differences in the type and quantity of wood burned, individual site conditions, and fuel moisture content.) This is

a daily rate of 1.25 to 13.3 tons over a period of 150 days. By comparison, forest management activities in Del Norte County currently generate approximately 1,500 tons per year.

An alternative disposal method that could be used for some of the wood waste is as a fuel at the Arcata Lumber Company power plant. That firm has two 80,000 pounds per hour boilers currently fueled by wood waste. The boiler systems are equipped with wet scrubbers for control of particulate emissions. Recent source tests indicated an average controlled emission rate of 1.26 pounds per ton of fuel (with a boiler consumption rate of 5.42 tons per hour). Disposal of wood waste by on-site incineration or the use of this material as boiler fuel is not expected to generate any significant off-site air quality impacts.R-2/

Use of wood waste from the project site as boiler fuel would depend on several factors such as the acceptance of this material as fuel, the cost of transporting this fuel to the plant, and the ability of this alternative to meet the prison's construction schedule. The actual means of disposing of wood waste debris generated by clearing of the Malarkey Forest site will be determined during final design of this facility.

Long-Term

Sources of long-term air emissions at the proposed prison would include those from on-site electrical generation, the operation of prison industries, and mobile sources.

The proposed prison will be equipped with stationary diesel generators to provide emergency electrical power during periods of local service disruptions. While large diesel generators have relatively high emission rates, it is anticipated that they would only be used during periods of local outages and not on a regular basis. These generators would be sized to only provide electricity of essential security and operational functions, not to serve the entire electrical load of the prison. The use of these generators is not expected to have a significant effect on local air quality.

The anticipated prison industries include a laundry, boot and shoe manufacturing, an optical laboratory, warehousing, facility maintenance, and

administration. None of these activities or those of the vocational programs are expected to generate significant air pollutant emissions. All will be contained within various program buildings and include appropriate ventilation controls that would be required for worker safety. For example, the dry cleaning operation (a vocational program) in the laundry will use a closed-loop system that prevents hydrocarbon emissions from cleaning solvents. Minor amounts of evaporative emissions could occur from the adhesives used in the boot and shoe manufacturing process. These emissions, while small, will also be properly controlled through the use of appropriate ventilation equipment.

Air emissions from mobile sources, employee, vendor, and visitor vehicles, were calculated on a worst case basis of the prison being operated at the 190 percent level. Air emissions were modeled using low wind speeds (approximately two miles per hour) and a moderately strong ground level temperature inversion. These emissions were modeled for the site and the surrounding Crescent City area.

The results of this analysis indicated that the highest peak hour carbon monoxide level experienced in the vicinity of the project area would be 3.2 parts per million (ppm). See Table E-2. The State 1-hour carbon monoxide standard is 20 ppm, while the federal 1-hour standard is 35 ppm. Even if the peak hour conditions continued for eight consecutive hours, the federal and State eight-hour standards of 9 ppm would not be exceeded. Other emissions from mobile sources would also not exceed State or federal standards.

While there will be a slight increase in mobile emissions, the proposed project will not have a significant long-term effect on local air quality.

MITIGATION MEASURES

The proposed project will not have any significant effects on local air quality so no mitigation measures are necessary.R-3/

TABLE E-2

PEAK 1-HOUR CARBON MONOXIDE CONCENTRATIONS
AT KEY INTERSECTIONS
(ppm)

Receptor	Malarkey Forest
NE Front & 101 SB	1.0
NW Front & 101 SB	1.1
SW 9th & 101 SB	3.2
SE 9th & 101 SB	2.2
NE 101 & Northcrest	1.6
SE 101 & Northcrest	1.4
SW 101 & Northcrest	1.1
NE 101 & Elk Valley	1.2
SW Washington & Northcrest	0.6

Note: State 1-hour CO standard is 20 ppm; the federal 1-hour standard is 35 ppm.

ppm = parts per million by volume.

AIR QUALITY REFERENCES

R-1/ Unless otherwise stated, information in this section is taken from a study prepared by Hackney and Company, Technical Report for the EAS, Proposed State Prison - Del Norte County, Report No. 10-Air Quality, July 1986.

R-2/ Letter dated October 31, 1986 from Catherine E. Hackney to Bob Sleppy concerning project air quality.

R-3/ Ibid.

F. NOISE

ENVIRONMENTAL SETTING

Existing noise levels on and adjacent to the Malarkey Forest site are very low. The only major source of noise adjacent to the project area is traffic on Lake Earl Drive and U.S. Highway 101. The remainder of surrounding land use is either undeveloped or low density rural residential type housing.R-1/

Twenty-four hour field measurements of the existing noise levels at the Malarkey Forest site were performed in June 1986. Noise measurements were taken on both the east and west sides of the parcel. The average day-night noise level (Ldn) for the west side of the parcel was 41 dBA. The corresponding noise level for the east side of the parcel was estimated to be 50 dBA. These values are typical of a quiet rural setting.

The only potentially sensitive noise receptors in the immediate vicinity of the project area are residential properties located east and southwest of the site. Based upon the preliminary site plan for this facility, these receptors are situated the following distances from the site. The first area consists of several residential properties along Kings Valley Road directly east of the Malarkey Forest site. U.S. Highway 101 is located between this area and the prison site. The homes closest to the project site will be approximately 1,300 feet from the nearest prison housing units.

The other area consists of a group of buildings located directly west of the southwestern corner of the site across Lake Earl Drive. Based upon the preliminary site plan, these buildings are situated approximately 1,100 feet from the rifle range. The main part of the prison complex and entrance are an additional 1,500 feet farther away.

Except for a few other structures that are similar distances from the site, the remainder of the potentially sensitive noise receptors in the project area are located over 2,500 feet from the proposed development portion of the Malarkey Forest site.

As noted in other sections, a major portion of the site will be cleared prior to the construction of the prison. However, the Department plans to leave a

buffer zone of trees and other vegetation around the outside edge of the Malarkey Forest parcel. Forested land presently exists on all of the parcels that surround the prison site. The Department does not anticipate any significant change in the present nature of these lands once the prison is completed.

ENVIRONMENTAL EFFECTS

Short-Term

Noise will be generated by heavy equipment used during the clearing and construction of the proposed project. While noise levels on the actual construction site could be high, the noise levels generated by equipment and construction activities is not expected to have a significant effect on residences near the site.

While it will be possible to hear equipment being used on the site, especially during the land clearing operations, there is a sufficient distance between the property and residential structures to reduce these noise levels to similar existing daytime levels. For example, a large tractor operating near the edge of the construction site would be expected to generate a noise level of approximately 85 dBA at 50 feet.R-2/ Based upon a reduction of 6 dBA per each doubling of distance from this noise source, this tractor would generate a noise level of about 60 dBA 1,000 feet from the building area.R-3/ An additional reduction in this noise level could be expected from the forested nature of the intervening terrain. The resulting noise level is not expected to have a significant effect on the surrounding residences.

Equipment used on the site will employ conventional mufflers and other noise suppression equipment common to modern construction vehicles and stationary motors. There is a possibility that limited blasting could be required in some parts of the site. However, this would involve only very small charges to loosen material in deeper bedrock areas.

While the sound of construction equipment will be audible to some surrounding residences, the proposed project is not expected to have any significant short-term effects on existing noise levels in the project area.

Long-Term

Potential long-term sources of noise from the proposed project include operational activities, prison industries, the firing range, and traffic.

Because of the institutional nature of a prison, the regular operation of the proposed facility is not expected to produce any significant noise increases. For example, the majority of the administrative and operational activities at a prison occur within enclosed buildings, warehouses, and in the housing units. Prison industries will be both enclosed in buildings and individually do not involve significant noise-generating activities. These factors greatly reduce the potential for noise problems around the site.

Probably the most notable operational sound generated by a prison is the use of the outdoor public address system. This system is used on an irregular basis for announcements in the recreation yards and other outside areas. The majority of facility communications occur by telephone or radio.

Typical outdoor public address systems normally generate sound levels in the range of 65 to 75 dBA at a distance of approximately 50 feet from the speaker. These sound levels do not take into account the effects of weather, intervening barriers, or site topography, which would further reduce these levels.

Because of the distance to residential structures from the housing units (over 1,000 feet) and the nature of the project setting, operational noise generated by the prison is not expected to be significant.

The proposed prison will be required to have a firing range for practice and training activities by correctional staff. Based upon the preliminary site plan, the range will be located in the southwestern corner of the Malarkey Forest site. The range will not be open to the public. Range use by the Department is typically 10-15 days per month.

Based upon noise studies prepared for other firing ranges, instantaneous noise peaks of approximately 55 to 85 dBA could occur at a distance of three-quarters of a mile if there are no barriers or other obstructions between the

receptor and the range. The upper range of this estimate, 85 dBA, is considered an extreme worst case situation that is normally not expected to occur.

A proposed safety berm will surround the firing range. Placement of this berm is expected to lower the projected noise levels by 5 to 20 dBA. Additional reductions in the noise levels generated by the range would result because of the intervening vegetation and background noise of Lake Earl Drive. While it is expected that noise from the range will be noticeable above the other background noise of the project area, noise generated by the range should not have a significant effect on adjacent properties.

Noise generated by prison traffic is expected to increase existing noise levels in the project area by low to moderate amounts. All future roadway noise levels were based upon traffic volumes projected for the prison operating at the 190 percent level, a worst case situation. It was assumed that vehicle speed, distribution throughout the day, and automobile/truck percentages would remain unchanged from present patterns.

For the Malarkey Forest site, local roadway day/night (Ldn) noise level increases are projected to be 5 dB on U.S. Highway 101, 6 dB on Lake Earl Drive, and 9 dB on Kings Valley Road. These values express the increases that will occur actually on the roadway. These values do not reflect reductions that occur from the distance between the roadway and adjacent structures or intervening barriers such as trees and vegetation.

The most direct off-site effect of noise generated by the prison will be from increased traffic on Lake Earl Drive. Access to the prison site will be from this street. Figure F-1 displays the distance from the center line of the roadway to the projected 60 Ldn noise contour based upon the above noise increases. The California Department of Health Services Guidelines for community noise identify the upper limit of the "normally acceptable" range for single family residential land use as being 60 Ldn.

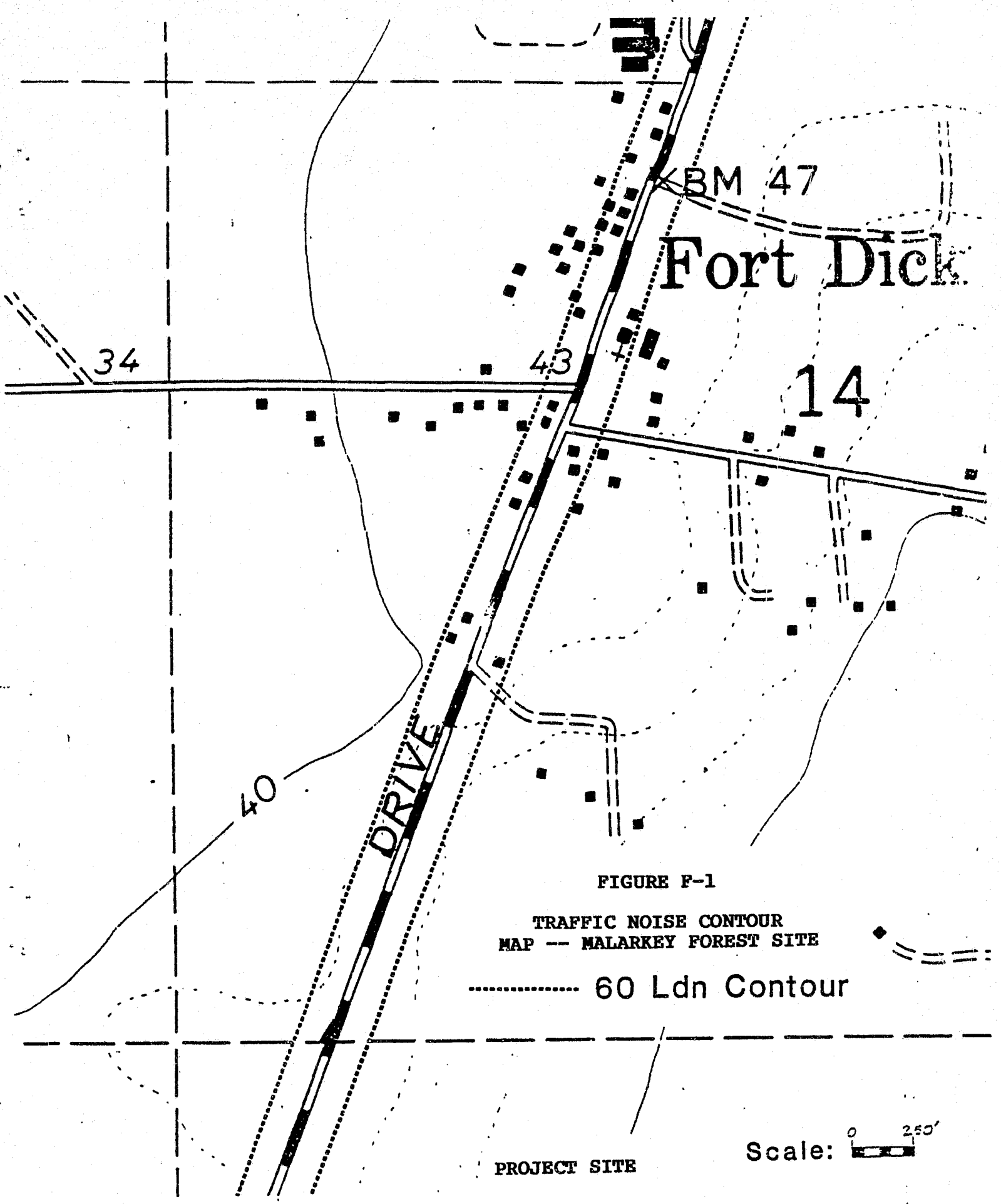


FIGURE F-1

TRAFFIC NOISE CONTOUR
MAP -- MALARKEY FOREST SITE

Based upon the estimated noise contours displayed on Figure F-1, several existing homes may experience noticeable noise increases when the prison is operated at its maximum capacity. Since noise increases of less than 5 dBA are barely noticeable, the potentially higher noise levels from traffic should not have a significant effect on the nearby community. However, while not expected to be significant, increased vehicle noise will occur on the access roads near the prison. These increases are generally unavoidable.

MITIGATION MEASURES

No mitigation measures other than those already incorporated into the design of the project, such as building set-backs, the firing range safety berm, and the use of good construction practices, are proposed for this project.

NOISE REFERENCES

R-1/ Information in this section was provided from a report by Nolte and Associates, Technical Report for the EAS, Proposed State Prison - Del Norte County, Report No. 11 - Noise, July 1986.

R-2/ D. N. May, 1978, Handbook of Noise Assessment, Van Nostrand Reinhold Environmental Engineering Series, page 211.

R-3/ California Department of Transportation, Transportation Laboratory, Noise Manual, October 15, 1982, pages I-3-4.

G. LIGHT AND GLARE

ENVIRONMENTAL SETTING

Project Area

The Malarkey Forest site presently contains no sources of night lighting. There are no lights on the roadways on the east and west sides of the parcel.R-1/

Lands surrounding the project site also have limited sources of night lighting. The majority of the lands surrounding the project area are in open space type uses or low density residential development. The residential areas that are closest to the prison site include the houses along Kings Valley Road east of the site across U.S. Highway 101 and a group of buildings southwest of the site across Lake Earl Drive. There are no occupied structures within approximately 1,100 feet of the prison building area.

While the general topography of the site and surrounding lands is nearly level, existing vegetation obscures most direct views of the project site. Although a large portion of the site will be cleared during construction, a buffer of existing vegetation will be left around the outside perimeter of the Malarkey Forest parcel.

Prison Lighting System

The perimeter of the prison's secure area will be fenced with a double row of chain link fencing topped with razor wire. Armed perimeter towers approximately 35 feet high will be located on the outside edge of this fence on approximately 700 foot centers. With the exception of a roof-mounted searchlight and a very low wattage high pressure sodium (HPS) lighting fixture over the entry door of each tower, no exterior lighting will exist on the towers. Mounted on the peak of the roof of each tower will be a high-powered searchlight. Each searchlight consists of a 1,000 watt incandescent lamp that generates approximately 1.5 million candlepower. The control of each searchlight will allow 360 degrees of horizontal movement and 55 degrees of vertical movement from horizon to ground.

Also located near the secure perimeter fence will be a series of wooden poles spaced approximately 180 feet apart for power, signal, and lighting fixtures. These poles will each have one street light-type fixture that will provide a total of two footcandles to the area on and immediately adjacent to the secure perimeter.

Lighting inside the perimeter of the secure area will be by 1,000 watt HPS lighting fixtures mounted on poles approximately 80 feet above the ground. The purpose of these lights is to routinely provide between two and five footcandles of light throughout this area. These lights will be hooded cutoff-type fixtures that are aimed downward. A single fixture will be mounted between housing units and will be pointed towards the perimeter fence, providing light in the "no-man's land" area between the housing units and perimeter fences.

The prison lighting system will not include fixtures that directly illuminate large areas outside of the secure perimeter. With the exception of the prison entrance and some of the parking areas, no exterior lighting is planned outside of the secure perimeter. The parking lot and prison's entrance would have sufficient lighting to provide approximately two footcandles of light throughout these areas.

Control of any roadway lighting fixtures will be by individual photocell located on each light. Prison lighting will generally be computer controlled with a manual override.

Prison policy currently requires all exterior lighting in the secure area to be turned on all night with the exception of the armed perimeter tower searchlights, which are only activated in emergency situations.

If it is determined that lighting is needed on the approach to the prison's entrance on Lake Earl Drive, the State has mandated that roadway lighting have an average lighting level of one footcandle. The lighting fixtures must also comply with the standards established by the California Department of Transportation.

ENVIRONMENTAL EFFECTS

Lighting in and around the prison facility itself is necessary because of the 24-hour nature of a prison operation and for reasons of security. As such, it is an unavoidable effect of the project. The perimeter lights facing in toward the housing units will create no direct glare problems for the surrounding environment. There is expected to be little reflected glare from the building surfaces because of their unpainted concrete construction. Potential glare is further reduced during periods of fog or overcast weather conditions, which are common during certain seasons in the North Coast region.

Perimeter lights along the secure perimeter generally constitute the greatest potential source of night light that may be directed outside the immediate boundaries of the prison. While unavoidable, the effect of these lights is moderated by their comparatively low mounting heights and downward (rather than outward) aim.

Prison lights, other than those required for roadway safety, will not be directed so that they cause problems of excessive glare or brightness to vehicles traveling on U.S. Highway 101 and Lake Earl Drive. The wooded nature of the project setting will also serve to minimize this potential problem. No prison lighting fixtures will shine light directly into any adjacent residences.

In summary, operation of the proposed prison will result in a new source of light. The project, however, is not expected to cause a significant amount of glare in the area, since lighting generally is designed to be directed downward and inward so that it effectively illuminates a very specific area. Prisons generally do not use lighting that spills over into large areas outside of the secure perimeter.

Prison lighting would contribute to a certain degree of skyglow even with the most directed lighting plan. This glow could be visible from some distant areas such as Crescent City during clear weather. Because the prison site is not completely obscured by trees or other topographic features, direct views of some lighting fixtures will probably be possible from some surrounding

points. While not considered a significant off-site issue, the presence of a new source of localized night lighting and skyglow are unavoidable effects of the project.

MITIGATION MEASURES

While the design of the lighting system and the project setting will greatly minimize the effects of light and glare, there are no measures available to completely avoid this new source of light.

LIGHT AND GLARE REFERENCES

R-1/ Information in this section was taken from a report by Nolte and Associates, Final Technical Report for the EAS, Proposed State Prison - Del Norte County, Report No. 12 - Light and Glare, July 1986.

H. TRANSPORTATION AND CIRCULATION

ENVIRONMENTAL SETTING

Introduction

Based upon preliminary plans for the proposed prison, access to the Malarkey Forest site will be provided using a central driveway off of Lake Earl Drive. Regional access to this site is by either Lake Earl Drive or U.S. Highway 101 via secondary streets such as Kings Valley Road or Elk Valley Road. See Figure H-1.R-1/

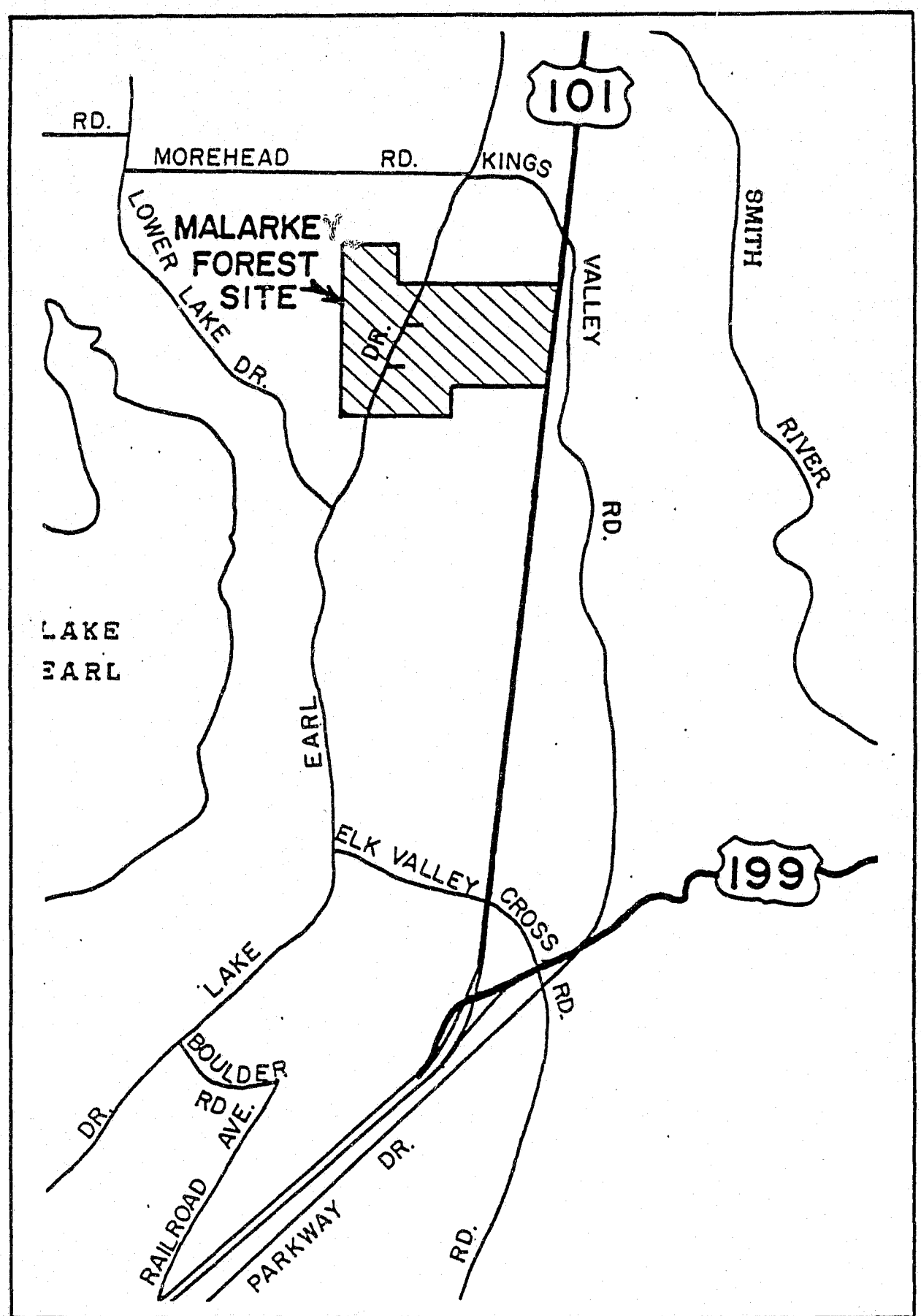
Roadway Characteristics

The regional and local roadway system in the Crescent City area is depicted on Figure H-2. This map includes the identification of the number of existing available travel lanes for the major roads in the system, as well as the location of all traffic signals. The following is a brief description of the major local roadways.

U.S. Highway 101. The Redwood highway, as it is locally known, is the main highway in the North Coast region. This highway also extends into Oregon. The Del Norte County Regional Transportation Plan classifies U.S. Highway 101 as a principal arterial. U.S. 101 varies in width from a 2-lane facility with 12-foot lanes and generally 8-foot shoulders; to a 5-lane facility with four 12-foot through lanes and a 12-foot 2-way left-turn lane; to a 4-lane grade separated freeway. This road carries between 10 to 15 percent truck traffic, primarily for forest products and fishing-related purposes. This road also carries a large number of recreational vehicles, especially in the summertime.

State Route 199. This highway is the main link between western Del Norte County and the towns of Hiouchi and Gasquet. The road eventually connects to Grants Pass and Medford, Oregon. This is generally a mountainous two-lane road. This roadway has an interchange with U.S. 101.

Northcrest Boulevard/Lake Earl Drive. Designated as a major collector, this roadway serves commercial and residential areas north of Crescent City. It is a four-lane divided roadway between U.S. 101 and Washington Boulevard, a four-

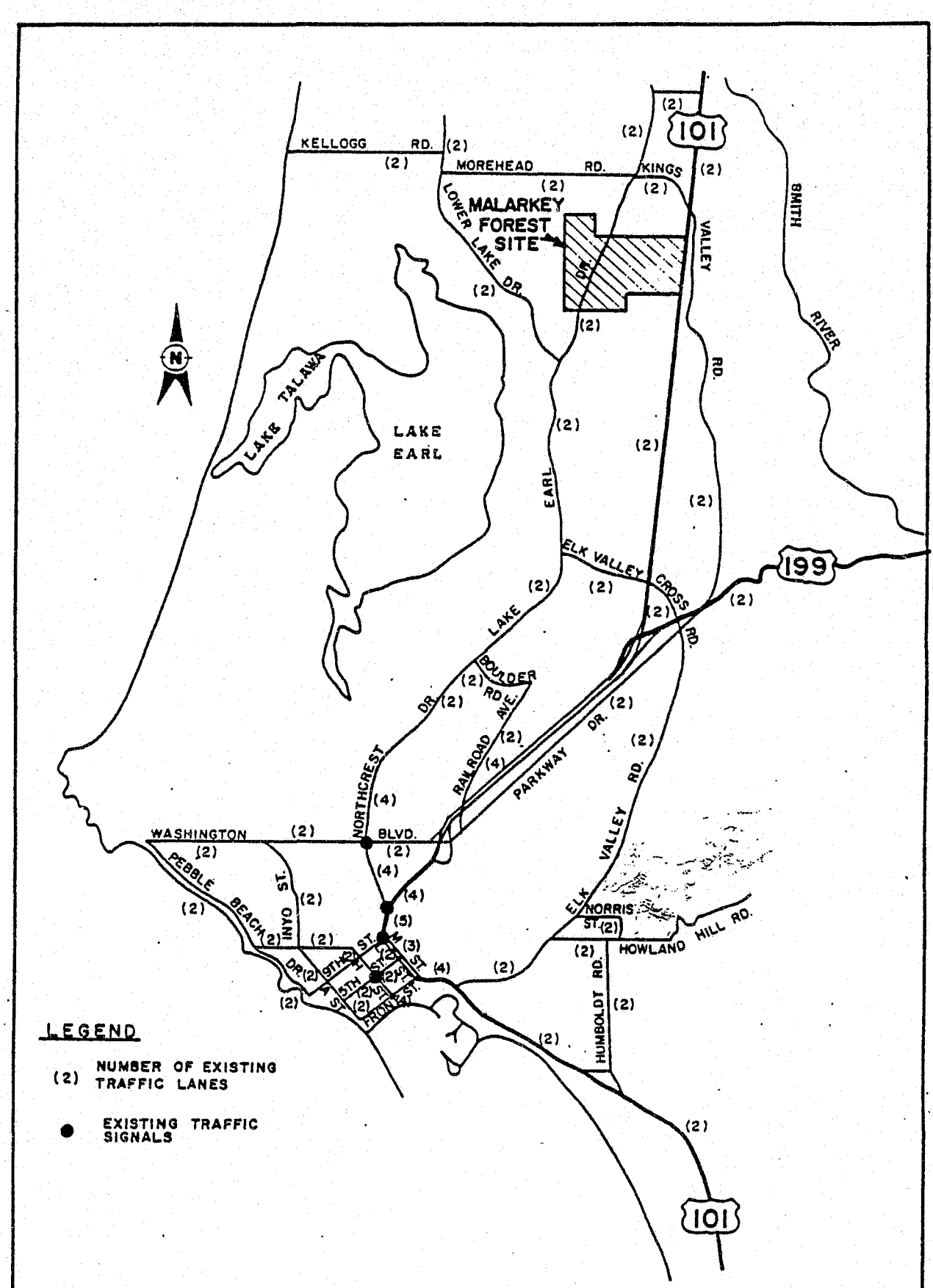


DEL NORTE PRISON ENVIRONMENTAL ASSESSMENT

MALARKEY FOREST SITE
LOCAL ROADWAY NETWORK

PREPARED BY JKM

FIGURE H-1



DEL NORTE PRISON ENVIRONMENTAL ASSESSMENT

PROJECT VICINITY AND REGIONAL ROADWAY SYSTEM

PREPARED BY JKM

FIGURE H-2

lane undivided road between Washington Boulevard and Old Mill Road, and a two-lane facility north of Old Mill Road. This road carries a large amount of local traffic and provides access to the County landfill.

Washington Boulevard. This is a two-lane major collector road that serves the airport, high school, and college.

Elk Valley Road. This is a two-lane major collector road that provides access to several residential and industrial developments to the east of Crescent City.

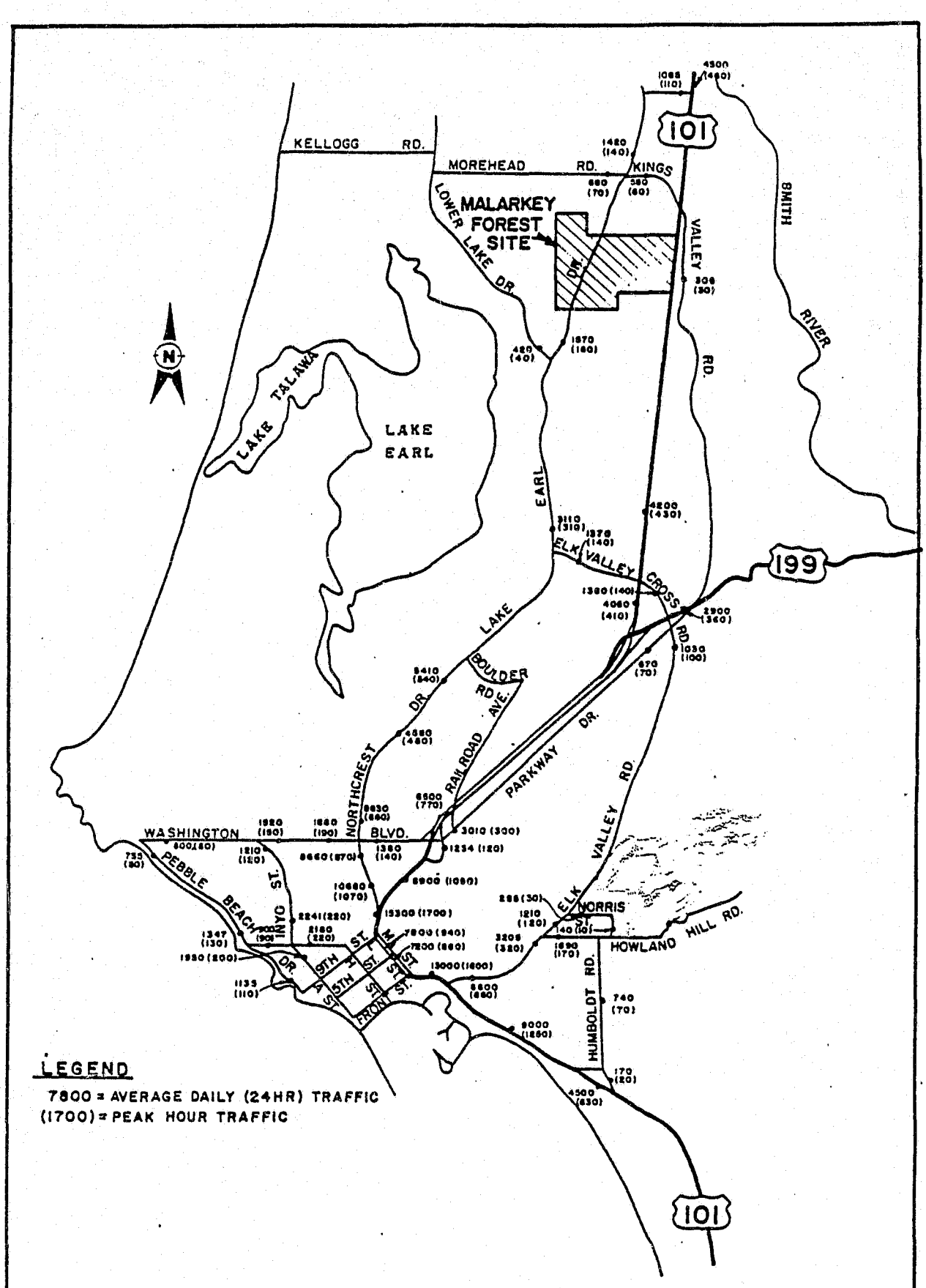
Kings Valley Road. Designated as a minor collector, this two-lane road extends from Lake Earl Drive to Elk Valley Road. It provides access to rural residential and recreational areas.

Existing Traffic Volumes

The existing average daily and peak hour traffic volumes for the regional road system in the project area are illustrated on Figure H-3. These volumes were obtained from several sources including the 1986 Caltrans Traffic Volume Report, the Del Norte County Public Works Department, and field studies prepared for the EAS. As most data is available on a daily basis only, peak hourly estimates were based on a peak hour percentage of ten calculated peak hour field counts done in May 1986.

The volume-to-capacity or V/C ratio is an indication of the level of service at which an intersection or roadway segment is operating. Briefly, the level of service ranking system is a scale with a range of A through F. Level A represents free flow conditions and level F represents jammed or capacity conditions.

The results of the capacity analysis indicate that most roadways in the study area are operating at Level of Service (LOS) B or better. Level of Service C is commonly accepted as a minimum design criterion in smaller communities. Table H-3 provided later in this section displays the existing LOS rating for many local roadways and intersections.



DEL NORTE PRISON ENVIRONMENTAL ASSESSMENT

EXISTING TRAFFIC VOLUMES

PREPARED BY JKM

FIGURE H-3

Public Transportation

Public transportation is provided in Del Norte County through a partnership of the County and Crescent City. The various systems are operated by private companies under contract to the County and City. Services presently serving this area include two demand responsive door-to-door taxi services, a local bus between Crescent City and Klamath Glen, a bus service for citizens, and a door-to-door service for retarded individuals. Crescent City is served by Greyhound Bus Lines from other communities. There is presently no local bus service between the prison site and adjacent communities.

Crescent City is currently served by one commercial airline service at the Jack McNamara Field. Ground transportation from the airport is by private vehicle or the local taxi services.

While Crescent City does have a commercial fishing harbor, no passenger boat services are presently available.

ENVIRONMENTAL EFFECTS

Traffic Generation

Table H-1 provides a summary of the number of employees, vendors, and visitors that are anticipated at the proposed prison for the 100 percent, 120 percent, and 190 percent occupancy levels. To provide a worst-case analysis of the proposed project, discussions of increased traffic generally concentrate on the 190 percent level since this would be the maximum operational level for this facility.

Most of the prison employees and visitors are expected to arrive by passenger car or light trucks. Vendor traffic will consists of medium to heavy delivery trucks. Special prison project traffic will generally use buses.

Estimates of daily and peak hour traffic at the Malarkey Forest site are presented in Table H-2. Results presented in the table show that the project is expected to generate a total of 2,668 daily trip ends and 1,062 peak hour trip ends at 100 percent occupancy. At 120 percent occupancy, the project is expected to generate 3,062 daily trip ends and 1,242 peak hour trip ends. At

TABLE H-1

SUMMARY OF DAILY PRISON ACTIVITY

GROUP	TIME PERIOD OF ACTIVITY	NO. OF INDIVIDUALS PER DAY @ OCCUPANCY RATE OF: 100%	120%	190%
Operations Employees	1st Watch: 11pm-7am*	88	106	132
	2nd Watch: 7am-3pm	746	896	1,116
	3rd Watch: 3pm-11pm	147	179	221
Prison Industries Employees	Generally: 7am-3pm	77	77	77
Vendors	Weekdays: 8am-4pm	21	21	21
Visitors	Sat. & Sun: 9am-3pm	250	250	250
	Mon., Thurs. & Fri.: 2pm-8pm			
Special Prison Projects	Weekdays: 8am-4pm	4	4	4

SOURCE: The Economic and Fiscal Impact of a State Prison in Del Norte County, Engineering-Economics Associates, Inc.

* Staff arrivals and departures are generally spread over as much as an hour.

NOTE: Staff trip generation is reduced on Saturdays and Sundays due to reductions in administration and operations staff.

TABLE H-2

DEL NORTE COUNTY PRISON SITE
SUMMARY OF TRIP GENERATION

GROUP	DAILY NUMBER	TRIP ENDS GENERATED DAILY	AM PK. HR. 6:30-7:30 IN	AM PK. HR. 6:30-7:30 OUT	PM PK. HR. 2:30-3:30 IN	PM PK. HR. 2:30-3:30 OUT
Operations Employees						
100% Occupancy	982	1,964	746	88	147	746
120% Occupancy	1,179	2,358	896	186	177	896
190% Occupancy	1,469	2,938	1,116	132	221	1,116
Prison Industries Employees	77	154	77	Nom.	Nom.	77
Vendors	21	42	Nom.	Nom.	3	3
Visitors	250	500	Nom.	Nom.	42	42
Special Prison Projects	4	8	Nom.	Nom.	1	1
TOTAL TRIP ENDS						
100% Occupancy	1,334	2,668	823	88	193	869
120% Occupancy	1,531	3,062	973	106	223	1,019
190% Occupancy	1,821	3,642	1,193	132	267	1,239

the 190 percent level, the proposed prison would generate 3,642 daily and 1,506 peak hour trip ends. A trip end is considered to be a one-way movement, either to or from the project.

Because of the distance to other large communities, such as Eureka, it was assumed that the majority of the prison employees would live in Crescent City or the surrounding areas.

Traffic generation rates for this project were based upon employee travel patterns at other State prisons. According to this data, approximately 84 percent of all employees drive to work alone, while approximately 12 percent participate in carpools. The remainder travel by other means such as bus or bicycle. The relative concentration of prison employees in the Crescent City area should result in a higher use of carpools or other transportation modes. However, for purposes of this report, the lower figure cited above was used.

Project Traffic

Based upon projected prison staffing levels and employee travel patterns it is not anticipated that the proposed project would have a significant effect on adjacent roadways. This finding applies to all expected prison occupancy levels, including the 190 percent level. These findings are provided in Table H-3, which provides a capacity analysis for several major roadways and intersections in the Crescent City area. This table compares existing Level of Service to the levels that would occur with prison traffic. The table indicates that there will be no significant changes in the Level of Service presently experienced on the listed roadways.R-2/

Site Access

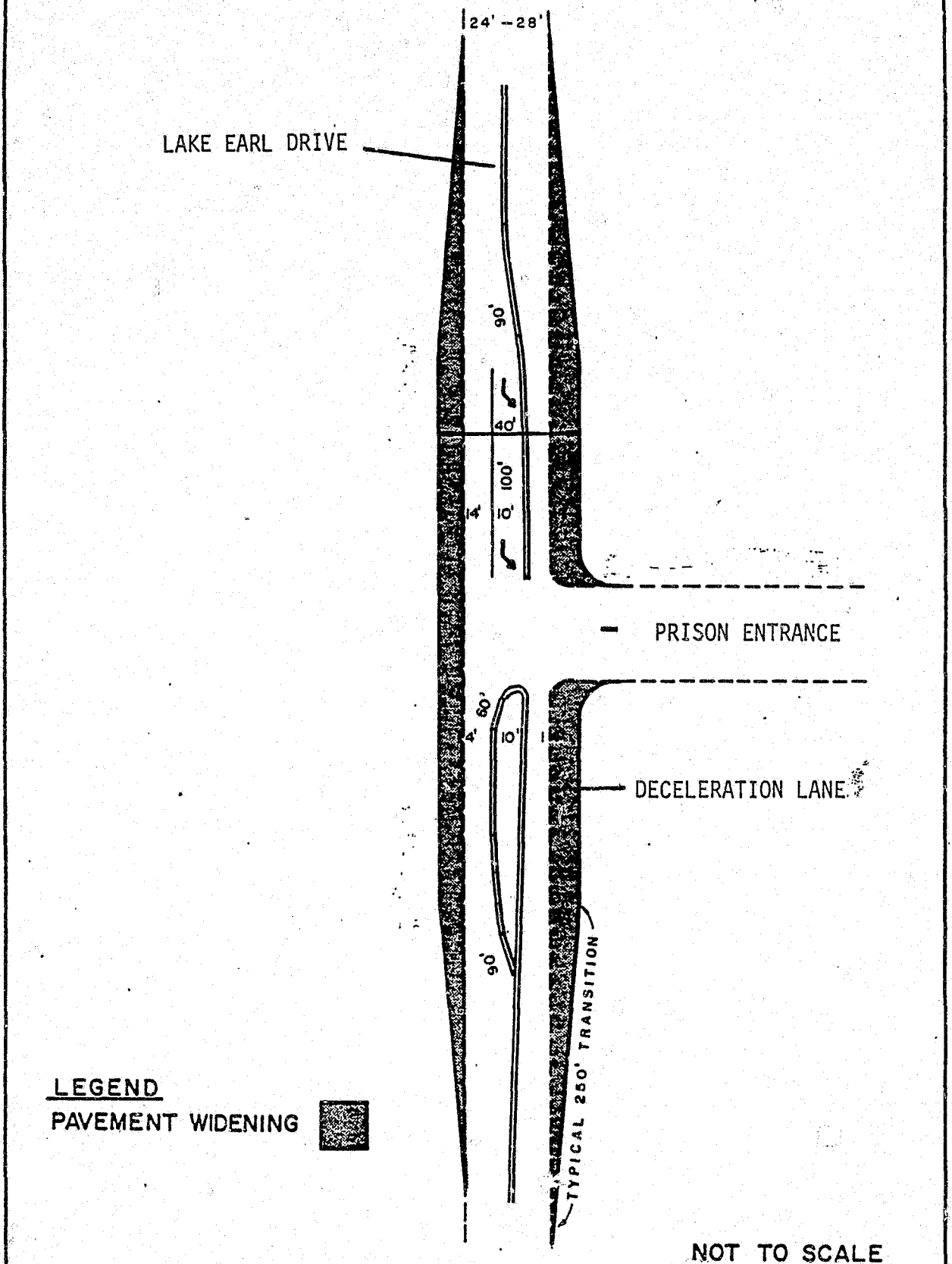
Site access to the Malarkey Forest site will be from a single driveway off of Lake Earl Drive. Access design will have to provide sufficient queuing space for vehicles to leave the site. To provide for safe access into the site, a left-turn lane will be added to Lake Earl Drive at the site entrance. Figure H-4 depicts the typical left-turn lane arrangement that would be utilized at the site.

TABLE H-3

MALARKEY FOREST PRISON SITE

ANALYSIS OF PEAK HOURLY ROADWAY TRAFFIC VOLUMES

ROADWAY SEGMENT	PEAK HOUR DESIGN CAPACITY EXISTING	PEAK HOUR DESIGN CAPACITY FUTURE	PEAK HOUR VOLUMES EXISTING	PEAK HOUR VOLUMES EXISTING AND PROJECT	CAPACITY ANALYSIS EXISTING V/C	EXISTING LOS	CAPACITY ANALYSIS FUTURE BASELINE V/C	FUTURE BASELINE LOS
U.S. 101								
S/O Humboldt	1,860	1,860	630	680	0.34	A	0.37	A
Humboldt/Elk Valley	1,860	3,800	1,250	1,260	0.67	B	0.33	A
Elk Valley/Front	3,800	3,800	1,600	1,610	0.42	A	0.42	A
9th/Northcrest	4,750	4,750	1,700	1,700	0.36	A	0.37	A
Northcrest/Washington	3,800	3,800	1,050	1,060	0.28	A	0.28	A
Washington/S.R. 199	3,900	3,900	410	420	0.11	A	0.11	A
S.R. 199/Kings Valley	1,860	1,860	430	490	0.25	A	0.26	A
N/O Kings Valley	1,860	1,860	460	460	0.25	A	0.25	A
M Street								
Front/5th	2,850	2,850	860	930	0.30	A	0.33	A
5th/9th	2,850	2,850	940	990	0.33	A	0.35	A
L Street								
9th/5th	1,880	1,880	940	1,000	0.50	A	0.53	A
5th/Front	1,860	1,880	860	940	0.46	A	0.50	A
Northcrest								
U.S. 101/Washington	2,880	2,880	1,070	1,110	0.37	A	0.39	A
Washington/Lake Earl	2,880	2,880	880	960	0.31	A	0.33	A
Lake Earl								
Northcrest/Elk Valley Cross	1,860	1,860	540	640	0.29	A	0.34	A
Elk Valley Cross/Lower Lake	1,860	1,860	310	550	0.17	A	0.30	A
Lower Lake/Kings Valley	1,860	1,860	160	440	0.09	A	0.24	A
N/O Kings Valley	1,620	1,620	140	140	0.09	A	0.09	A
Kings Valley								
Lake Earl/U.S. 101	1,520	1,520	60	200	0.04	A	0.14	A
E/O U.S. 101	1,520	1,520	30	35	0.02	A	0.02	A
State Route 199								
E/O U.S. 101	1,620	1,620	360	370	0.22	A	0.24	A
Elk Valley								
U.S. 101/Howland Hill	1,700	1,700	660	660	0.39	A	0.39	A
N/O Howland Hill	1,620	1,620	120	130	0.07	A	0.08	A
Washington								
Parkway/Northcrest	1,840	1,840	140	140	0.08	A	0.08	A
Northcrest/Inyo	1,840	1,840	190	220	0.10	A	0.12	A
W/O Inyo	1,700	1,700	60	60	0.04	A	0.04	A



DEL NORTE PRISON ENVIRONMENTAL ASSESSMENT

TYPICAL LEFT TURN IMPROVEMENTS

PREPARED BY JKM

FIGURE H-4

Road Surface

The road surface on Lake Earl Drive is in generally good condition while Kings Valley Road is experiencing some minor pavement deterioration. No significant amounts of pavement resurfacing is needed near the entrance to the prison site.

Construction Traffic

No significant impacts are anticipated from traffic generated by construction of the prison. Lake Earl Drive can safely accommodate large equipment and materials trucks and construction crew traffic.

MITIGATION MEASURES

Project

The proposed project is not expected to have a significant effect on existing traffic circulation in the Crescent City area. The Department will provide a left-turn lane on Lake Earl Drive at the entrance to the prison. The shoulders of the road near the prison entrance will also be widened to improve traffic flow and safety.

TRANSPORTATION AND CIRCULATION REFERENCES

R-1/ Information in this section was taken from a report by Nolte and Associates, Final Technical Reports for the EAS, Proposed State Prison - Del Norte County, Report No. 9 - Transportation and Circulation, July 1986.

R-2/ Revised traffic volume maps (Table H-3), Jeff Clark, TJKM Transportation Consultants, September 9, 1986.

I. UTILITIES

1. GAS

Natural gas is not available in Del Norte County, so there will be no discussion of this utility in the EAS.

2. ELECTRICITY

ENVIRONMENTAL SETTING

Presently there is no electrical service to the Malarkey Forest site because it is undeveloped forest land. Existing demands for electrical energy in the vicinity of the project site are related primarily to residential and agricultural uses.

Pacific Power and Light Company provides electrical service in the Del Norte County area. Pacific Power and Light generates the majority of its power outside of California and distributes it throughout the Northwest via a transmission grid system. The company provides service to Del Norte County via two parallel transmission lines that extend to Oregon. These transmission lines are not looped to the main power grid in Oregon. If these lines are out of service, electric power to the County can be disrupted.

Pacific Power and Light buys approximately 8.5 megawatts of electric power generated by Arcata Lumber Company in Del Norte County. While this power augments outside sources, this power source is too small to be used to meet the area's electrical needs if service is cut off from the north, nor could it be used to directly serve the proposed prison.

Pacific Power and Light owns and maintains transmission and distribution lines near the project site. The transmission line is a 69 kilovolt (kV) overhead line and is aligned along Morehead Road, approximately one mile north of the project site. The distribution lines are 12 kV or smaller lines and are located adjacent to the proposed site along Lake Earl Drive. The substation that is closest to the project site is near the intersection of U.S. 101 and Morehead Road. There are no transmission or distribution lines that cross the Malarkey Forest site except where Lake Earl Drive divides the parcel. There are also no power line easements that cross the site.

ENVIRONMENTAL EFFECTS

The proposed prison would have an estimated peak electric power demand of 10 megawatts. This estimate includes demands from the prison and prison industries. No alternative sources of power exist that would offset the estimated demand for electrical power at the prison.

The existing 12 kV and smaller distribution lines are not adequate to handle the prison's power load. Only the 69 kV transmission lines are capable of supplying the peak electric power demand of 10 megawatts. The existing substations are not designed to handle the additional load that the prison would add and a new substation will be required.

The 69 kV transmission line along Morehead Road would be tapped and a new 69 kV line would be strung along Lake Earl Drive to the prison site. The alignment would follow that of the existing distribution lines. The substation would be constructed adjacent to the prison property. It would not be necessary for the utility to acquire additional right-of-way for the transmission line but the utility would have to acquire property for a substation site.

The proposed prison will be provided with generators capable of producing approximately one megawatt. This system would be used during local power outages to operate essential prison facilities.

Construction of electric power lines and extension of service to the prison is not expected to have a significant off-site effect. Construction of the power lines and substation will only have minor short-term impacts such as pole installation and reconductoring.

The increased demand for electricity at the prison is also not expected to have a significant effect on other users in the Crescent City area.

MITIGATION MEASURES

The proposed project will have no direct, off-site effects on local electrical service so no mitigation measures are necessary. On-site generators will be provided to supply power to essential facilities during periods of local outages.

3. TELEPHONE

ENVIRONMENTAL SETTING

Telephone service to Del Norte County is currently supplied by West Coast Telephone Company, a subsidiary of GTE. The existing telephone lines in the County are owned and maintained by the West Coast Telephone Company. The central switching center of West Coast Telephone is in Crescent City. The center is an analog switching system (rotary dial). West Coast Telephone plans to convert the system to digital dialing in 1989.

An existing 12-pair aerial service cable, aligned in an existing road right-of-way along Lake Earl Drive, is adjacent to the construction site. This cable has a capacity of 12 trunk lines. A 24-pair aerial toll cable extends across the site to the Smith River switching center. This toll cable is a digital carrier system and is capable of providing up to 48 trunk lines per cable pair. This toll cable presently does not serve the project area.

ENVIRONMENTAL EFFECTS

During construction, the proposed project would require approximately 50 trunk lines. Once the prison is operational, it would need approximately 400 trunk lines. The existing lines would provide the additional 50 trunk lines required during the construction of this facility, but the lines do not have the capacity to provide the additional 400 trunk lines. It will be necessary to lay new cables from the project site to the central switching center to provide these additional 400 trunk lines. Also, additional switching capacity will be required at the central switching center in Crescent City.

Installation of the necessary additional telephone lines is not expected to have a significant effect on the environment. All construction would occur in existing utility corridors and involve only minor construction activities.

Expanding the area's existing telephone services would not affect the ability of West Coast Telephone to provide service to other users in the Crescent City area.

MITIGATION MEASURES

The proposed extension of new lines and upgrading the local telephone system is not expected to have any direct, off-site effects so no mitigation measures are necessary.

4. SOLID WASTE

ENVIRONMENTAL SETTING

Solid waste generated in the project area is disposed of at the Del Norte County landfill, which is about two miles north of Crescent City off Old Mill Road. Garbage service in the Crescent City and surrounding area is provided by Klamath Sanitation, Inc., a county-wide franchised collector.

The County landfill accepts approximately 40 to 50 tons of domestic and commercial solid waste per day. This figure includes the dry weight of sewage sludge, septic tank liquid, cheese whey, and fish wastes. The Solid Waste Element to the 1980 Del Norte County indicates that this landfill has a remaining life expectancy of at least 14 years.

The landfill had violations or threatened violations of waste discharge requirements in early 1986, as reported by the North Coast Regional Water Quality Control Board. The Regional Board is the regulatory agency with primary responsibility for overseeing the landfill's operation to prevent groundwater pollution. The Regional Board is working with Del Norte County to rectify these violations and prevent future ones.

ENVIRONMENTAL EFFECTS

The Department of Corrections estimates that prisons generate approximately 30 pounds of solid waste per inmate per week (4.3 pounds per day). This total includes solid waste from prison industry programs. Based upon a worst case situation of the prison operating at the 190 percent occupancy level, the proposed facility would generate approximately 9 tons of waste per day. This amount excludes solid waste (sludge) generated by the wastewater treatment plant.

The total amount of waste requiring disposal is expected to be reduced by approximately two tons per day as a result of the prison Recycling and Salvage Program (RASP). Under RASP, solid wastes will be collected from various points within the prison and brought to an area where inmates will sort through the waste, removing cardboard and office paper, ferrous and glass food containers, aluminum drink containers, scrap cloth, leather, rubber, and other salvageable wastes. These materials would be removed from the prison grounds by a non-profit enterprise that specializes in recycling. The remaining seven tons of non-recyclable waste generated per day by the prison will require off-site disposal.

Some minor amounts of potentially hazardous materials are expected to be generated from operation of the prison industry programs and vehicle maintenance. These materials include small quantities of cleaning solvents and paint, waste oil from prison vehicles, and empty adhesive cans from the boot manufacturing operation (one-three per week). It has not been determined if the empty adhesive cans will be considered a hazardous material. Perchloroethylene generated by the dry cleaning operations will be recycled within a closed loop system and not require disposal.

Any hazardous materials on the site will be handled, stored, and disposed of in strict compliance with all applicable State and federal regulations. Compliance with such regulations could include transport of the waste to a licensed Class I waste disposal site by a registered waste hauler.

The Department has identified four alternative methods of disposal for the remaining seven tons per day of non-hazardous solid waste that must be disposed of from the proposed prison. These four options are as follows:

1. Use the Present Del Norte County Landfill, if it is Upgraded.

   If Del Norte County can bring this landfill up to meet the State regulations, the landfill has capacity to accept solid waste from the prison for approximately 14 years from present based upon the original estimate in the County Solid Waste Management Plan. It is possible that improved design and operational practices could increase the remaining capacity of this landfill.

The landfill, however, has serious operational and soil deficiencies that are contributing to groundwater pollution problems. The deficiencies of the present landfill result from its location on sand dunes that allows leachates from the wastes to percolate into underlying groundwater and also does not prevent rainwater from percolating through the waste. In addition, groundwater probably flows through the buried waste at some times of the year since groundwater in the area is very near the surface. Although it may be difficult to correct groundwater pollution from past waste burial, the landfill could accept solid waste without polluting groundwater further if the deficiencies are corrected.

2. Use a New County Landfill.

If Del Norte County finds and develops a new landfill, this landfill also could accept solid waste from the prison, since this solid waste is essentially the same as the present wastes of Del Norte County. No locations for a new landfill have been identified at this time.

3. Haul Solid Waste from the Prison to the Humboldt County Landfill.

The Humboldt County landfill near Eureka currently meets all the State disposal site regulations and has the capacity to accept solid waste from the prison. This landfill is owned and operated by the City Garbage Company of Eureka. It is 85 miles from Crescent City to the landfill; a round-trip carrying about 18 tons would take about 5 hours. City Garbage Company has indicated it would be willing to accept waste from the proposed prison.

4. Incinerate the Prison Solid Waste at Brookings, Oregon.

The Brookings Energy Facility consists of a 50-ton per day municipal solid waste incineration facility. The operators of this facility have indicated they are willing to accept waste from the prison, including sewage sludge. At present, the facility receives only 20 to 30 tons/day, so it could easily accept the

prison's 7 tons/day load. The facility has been running without shutdown for eight years because it has two independent burners. Residual ash is buried at the Oregon-controlled sanitary landfill at Gold Beach, Oregon (ten miles north of Brookings). Legal precedents exist for California solid waste to cross the State line.

All four options for solid waste disposal are environmentally sound and would have no adverse environmental effects. The Department will select a waste disposal system during the final design of the prison. All waste will be removed from the prison by a commercial waste hauler which has also not yet been selected by the Department.

MITIGATION MEASURES

The generation of a certain amount of solid waste is an unavoidable effect of the project. The proposed prison will also contribute to a small reduction in the remaining capacity of the landfill that receives the solid waste from the project. The proposed prison will have only a minimal overall effect on the selected disposal site because of the project's relatively small waste volume to that of the surrounding region.

5. SEWAGE DISPOSAL

ENVIRONMENTAL SETTING

Existing Conditions

The Malarkey Forest site is not served by a wastewater treatment facility. Residents in the project area currently use individual septic tanks and leach fields. The only large treatment facility in the project area is the regional wastewater treatment plant located in Crescent City.

The Crescent City wastewater treatment plant is located near the harbor on B Street. This facility presently serves four areas including the City, the harbor district, Bertsch Ocean View, and Northcrest. Over the last year and a half, average daily flow over a 30 day period from the entire system has ranged from a minimum of 1.1 million gallons per day (mgd) to a maximum flow

of 3.2 mgd. There have been peak daily flows that exceeded 5 mgd and instantaneous flows in excess of 8 mgd. These extremely high peak flows are due to infiltration and inflow (I/I) into the collection system.

The Crescent City wastewater treatment plant was upgraded and expanded in 1980 to provide secondary treatment for a design flow of 1.89 mgd and a population of 12,000. About 8,700 city and county residents currently use the sewer system.

The Crescent City wastewater treatment plant discharges effluent to the ocean through an outfall pipeline that terminates on the south side of Lighthouse Island in the surf zone. The outfall consists of approximately 600 feet of 18-inch pipeline, 1,000 feet of 12-inch pipeline, and 20 feet of 20-inch pipeline. The treated effluent flows by gravity most of the time, but must be pumped during high tides and high flow rates.

The treatment plant has met its discharge requirements with few exceptions since 1982 when wastewater from the fishing/seafood industry began to be discharged directly into the ocean to reduce the organic loading on the treatment plant. Tests performed in 1982 demonstrated that the currents and surf characteristics unique to the location of the outfall combine to dilute and disperse the effluent, thereby preventing an adverse effect on water quality at nearby beaches and the harbor. On the basis of these tests, the Regional Board granted Crescent City an exemption from the California Ocean Plan to allow for continued use of the outfall.

The treatment plant, however, has a serious problem associated with the infiltration/inflow problem. The plant is designed to handle a short-term peak flow of 4.07 mgd. Actual peak flow exceeded this design value numerous times in the winter of 1985-86 and reached an estimated 8 mgd on one occasion, resulting in the overtopping of the primary clarifiers. This situation is a continuing problem for the plant and has become an issue with the Regional Water Quality Control Board.

Anaerobically digested sludge is currently disposed of at the Del Norte County Landfill. The sludge, which has an average solids content of 3 percent, is hauled by tanker truck to the landfill and discharged to a sludge lagoon.

ENVIRONMENTAL EFFECTS

Wastewater Production

The proposed prison would generate approximately 0.75 million gallons per day (mgd) of wastewater. The prison would have a maximum day flow of 1.1 mgd. See Table I-1.

TABLE I-1: PROJECTED PRISON WASTEWATER FLOWS

Source	Flow (gpd)
Inmates and Staff	
300 single occupancy cells at 200 gpd/cell	60,000
1,900 double occupancy cells at 330 gpd/cell	627,000
Industrial Sources	40,000
	727,000

Based upon data from other State prisons, it has been estimated that prison wastewater would have a biological oxygen demand (BOD) of 500 milligrams per liter (mg/l), suspended solids (SS) of 300 mg/l, and total Kjeldahl nitrogen (TKN) 60 mg/l. Other constituents of wastewater, such as heavy metals and toxics, are expected to be in very low concentrations because of the non-industrial nature of the prison operation.

The Department is considering three wastewater treatment and disposal systems for the proposed prison. These alternatives and their environmental effects are discussed as follows:

Alternative 1. On-site Nitrification - Denitrification Activated Sludge Plant and Effluent Interceptor to Off-Site Rapid Infiltration Disposal Basin.

The first alternative wastewater system the Department is considering is construction and operation of an on-site treatment plant with effluent discharge to an off-site rapid infiltration basin. Under this alternative it has been assumed that the on-site plant would consist of an aerated pond

system or, if was necessary to remove nitrogen, a nitrification-denitrification activated sludge system (oxidation ditch). The latter process would remove nitrogen before disposal in the rapid infiltration if it was necessary to meet the discharge requirements. It was assumed for design purposes that the system would need to meet a discharge standard of 50 mg/l for BOD and 50 mg/l for SS. The Regional Board may also require disinfection of the effluent before discharge from the site. There is adequate space available on the prison site for the treatment plant and associated storage structures.

Liquid sludge from the on-site treatment plant would probably be disposed of to a dedicated area on the prison site. The sludge would be injected into the upper 12 inches of the soil so no solids could be washed off the site by rainfall. Surface drainage controls would also be provided. During periods of wet weather the sludge would be stored in a facultative lagoon, which would be sealed to prevent effluent infiltration to the local groundwater. These ponds will also have adequate capacity to prevent overtopping during wet weather. The Malarkey Forest site does not contain soils that are compatible with a rapid infiltration system, so no on-site effluent disposal is being considered by the Department.

Treated effluent from this system would be pumped through an interceptor to a series of rapid infiltration basins that would be on a 26 acre parcel located approximately 2 miles northeast of the prison site. The location of this parcel and the alternative routes of the effluent disposal lines are displayed on Figure I-1. This parcel is on the Strahm Lily farm and was selected because the soils are loamy and sandy alluvium with permeabilities (clean water basis) up to 20 inches per hour. Depth to groundwater in this area is generally greater than ten feet. The parcel lies within the 100-year floodplain of the Smith River, but it could easily be protected from flooding by the use of berms. Preliminary assessments of this parcel indicate that it would meet the Regional Board's standards for rapid infiltration. Factors that have been considered include its highly permeable soil type, the depth to groundwater, and its distance from the Smith River. Additional hydrological and geological studies are being conducted by the Department to confirm these initial findings and to aid in the final design of the basins. The rapid

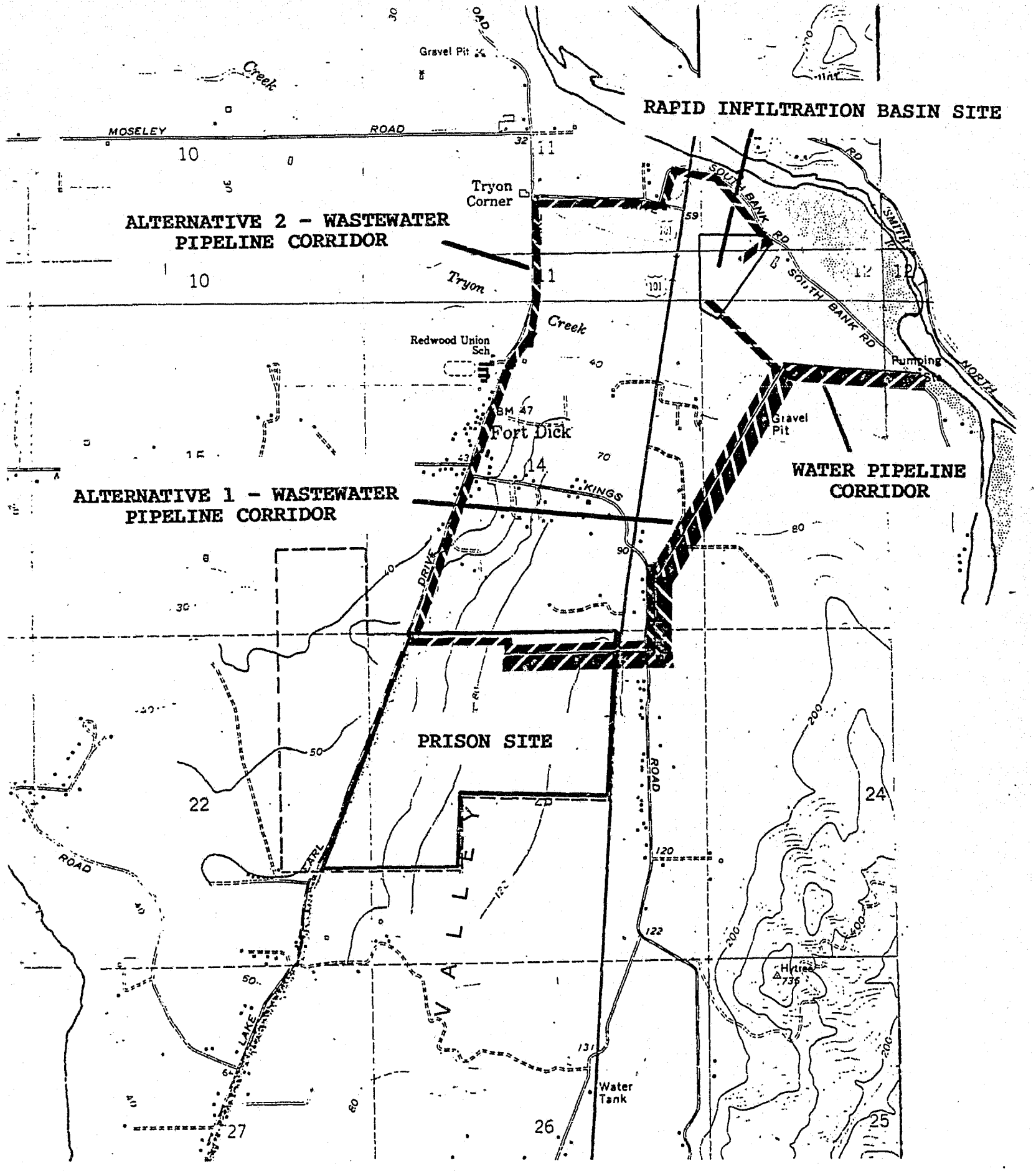


FIGURE I-1

WATER AND WASTEWATER PIPELINE CORRIDORS
AND
RAPID INFILTRATION BASIN SITE

aeration, which also serves to maintain a completely mixed regime. After a specified period of time, the mixture of new cells and old cells is passed into a settling tank where the cells are separated from the treated wastewater.

The wastewater treatment plant would have a sludge treatment facility that would require approximately three acres of the project site. The plant would produce sludge continuously, but would store the sludge for approximately 30 days or more, resulting in an aerobically digested waste sludge that requires no further stabilization. For process control, sludge would be removed regularly to an acceptable landfill. The liquid sludge would be disposed of through land application by the same method described in Alternative 1.

The effluent interceptor to its connection with the Crescent City ocean outfall would be approximately six miles long. This pipeline would be constructed along existing streets and/or utility easements.

The North Coast Regional Water Quality Board would control waste discharges from this system. The Board would probably require 30-day average BOD and SS effluent concentrations of 30 mg/l, along with disinfection to median coliform bacterian values of 23 MPN/100 ml. For disposal in the Crescent City outfall, the Board probably would require an investigation of the possibilities of using tertiary treatment or extending the outfall to deeper water. Such studies would be prepared as part of the permit application process to the Regional Board.

The environmental effects of this alternative include temporary construction-related effects such as site grading and trenching activities. Construction of the effluent interceptor could have the potential to effect archaeological deposits and plant and animal resources that may occur in the pipeline corridor. Additional surveys of the easement for these resources would be conducted if this alternative is selected. During project operation, there is a potential that disposal of effluent with the Crescent City ocean outfall would slightly decrease water quality near the outfall because the additional effluent would increase flow and decrease dilution. Studies prepared for the waste discharge permit would specifically address this issue.

Alternative 3. Sewer Interceptor from the Prison to Expanded Wastewater Treatment Facilities in Crescent City and Disposal with the Crescent City Outfall.

The third and last wastewater alternative being considered by the Department would be to pipe the prison's effluent directly to the existing Crescent City Treatment Plant. At this plant, primary and rotating biological contactor sludges are thickened and anaerobically digested in separate processes. Anaerobically digested sludge is hauled daily to the Del Norte County Landfill. It would be necessary to expand the existing treatment plant to accommodate prison wastewater. This expansion is expected to require approximately three acres.

Any expanded use of the Crescent City wastewater plant would require an investigation into the existing infiltration and inflow problem. The probable discharge requirements for this alternative would be similar to those described for Alternative 2. Additional studies would be necessary to determine the exact improvements that would be needed to handle the prison flows and to correct the infiltration problem. The environmental effects of the construction of the wastewater interceptor would be similar to Alternative 2.

MITIGATION MEASURES

The generation of wastewater that must be disposed of is an unavoidable effect of the project. Regardless which of the three wastewater alternatives is selected, compliance with the regulations of the California Water Resources Control Board will be required. Mitigation measures have been incorporated into each of these three alternatives to prevent the project from causing water quality problems.

6. DRINKING WATER

ENVIRONMENTAL SETTING

Crescent City obtains water from a collector facility on the Smith River approximately a mile and a half northeast of the prison site. This water system serves approximately 3,100 residential, commercial, and industrial

accounts. The City has a water rights permit from the California Water Resources Control Board to withdraw 9.8 cubic feet per second (cfs) from the river through a subsurface collector. The City's permit limits it to a total annual diversion of 2,600 acre feet. In 1985, the City diverted 1,400 acre feet.

The Crescent City annual average water use was 1.256 mgd in 1985. The maximum month water use occurred in July. The maximum daily demand also occurred in July.

The City meets the maximum fire flow demand of 4,500 gpm by pumping from 2 storage tanks of 1.0 and 1.5 million gallons that are located in downtown Crescent City.

Major components of the Crescent City water supply are as follows: three pumps draw water from the Smith River through a Ranney Collector. Pumped water flows through a single barrel transmission main consisting of 14-inch, 12-inch, and 10-inch diameter cast-iron pipe. An elevated 50,000 gallon equalization-storage tank, located near the terminus of the 14-inch main, provides surge suppression and pump control. Before entering the elevated storage, water is metered, chlorinated, and fluoridated. From the elevated tank, water flows by gravity to town during periods of low demand and through two booster pump stations during periods of high demand. Water delivered in excess of demand is stored in 1.0 and 1.5 million gallon ground level steel reservoirs that are located in downtown Crescent City.

Water from the Smith River is excellent for domestic use. The water is low in hardness and dissolved solids. The water meets all State and federal public health criteria for metals and other inorganics. The water is not contaminated with pesticides and has a radioactivity level that is less than background radioactivity. Water from the Smith River does require chlorination prior to use for human consumption.

County areas not served by the Crescent City water system generally obtain their water from small relatively shallow wells. The aquifer used in the Malarkey Forest area is the Battery Formation, a compact marine terrace deposit of fine sand and clay. This deposit is poorly to moderately permeable and typically only produces a low yield of water.

Because of the volume of water needed by the prison and the low yield of the Battery Formation, the Department does not intend to use on-site wells to supply drinking water.

ENVIRONMENTAL EFFECTS

The projected water demand for the proposed prison would be 220 gallons per inmate per day (gpd). This figure includes normal water use by inmates and prison support staff and also includes 40,000 gpd for prison industries. Table I-2 presents a summary of projected water demands.

TABLE I-2: PROJECTED WATER DEMANDS

	Demand Per Inmate (gpd)	Total Demand (mgd)	Total Demand (gpm)
Average Day	220	0.90	630
Maximum Month	268*	1.10	770
Maximum Day	374*	1.53	1,070
Maximum Hour	660*	2.71	1,890

*Based on typical peaking factors for prison water systems.

The projected maximum annual water demand for the prison is approximately 1,000 acre feet. The estimated fire flow requirement for the prison is 3,000 to 3,500 gpm.

California Water Works Standards require that the minimum available water supply must equal or exceed the maximum day demand. Therefore, the minimum water supply rate to the new prison would be 1.53 mgd.

The Department is currently planning to supply drinking water to the proposed prison by connecting to the existing Crescent City water system which draws water from the Smith River northeast of the project site.

Based upon preliminary plans, the prison would obtain water by constructing a 12-inch diameter intertie to the city water treatment facility near the river. The intertie line would follow the easement of the existing line from the site to the river. See Figure I-1. A water metering facility would be provided at a location acceptable to the City. Two 650,000 gallon ground level steel tanks would store water on the prison site. A new booster pump station would have enough capacity to pump peak monthly demands plus fire flow from the storage tanks into the prison distribution system. Fire flow pumps and standby power would be provided with the booster pump station. Hydropneumatic tanks would equalize pressure in the system.

To accommodate the increased demand from the prison, the City water supply system would require the following improvements:

- New larger capacity pumps and controls would be needed in the Ranney Collector. Additional standby generator capacity would be needed to operate the larger pump and motors in the event of a power failure.

- A 12-inch diameter transmission main parallel to the existing 14-inch diameter transmission main would be required to convey water from the Ranney Collector to the prison site in order to maintain acceptable pressures and velocities in the pipelines.

- The City water treatment facility would require improvements consisting of increasing the capacity of the chlorination and fluoridation facilities and providing a new larger capacity flow meter with new instrumentation.

Under this alternative, Crescent City will need to file a petition with the California Water Resources Control Board, Division of Water Rights to expand its area of use to include the prison site. In addition, the City or the Department will need to file an application for an annual appropriation of 1,000 acre feet of water from the Smith River.

Preliminary indications are that water is available for appropriation. Flow extremes, as measured by the USGS Gaging Station, located 0.5 miles downstream of the South Fork, have been 228,000 cubic feet per second (cfs) for the

instantaneous high and 160 cfs for the instantaneous low flow. The average annual discharge from the river is 2,805,000 acre-feet/year. The total quantity of appropriations downstream of the Gaging Station is 11.12 cfs. This includes 9.8 cfs appropriated to Crescent City.

The Smith River is included in both the California Wild and Scenic Rivers System and the National Wild and Scenic Rivers System. As a result, the Secretary of the California Resources Agency will be required to make a final determination as to whether the additional appropriation is consistent with the Wild and Scenic Designation of the river after reviewing a written proposal.

The pumping of additional water from the City's existing subsurface collector is not expected to have any significant effect on the amount of water flowing in the Smith River or its water quality. Representatives of the California Department of Fish and Game have indicated that withdrawal of this amount of water would not be expected to have a significant effect on fish and other aquatic species in the river.

Construction of an additional waterline from the proposed prison to the City's water collector on the Smith River will cause minor construction impacts from trenching and grading. However, since this line will follow an existing pipeline corridor and there are no sensitive plant communities in the area that would be disturbed, these impacts are expected to be minimal. It should be noted that the pipeline will pass through an area of potential historical significance. See the section on Archaeology for the measures to protect this potential resource.

MITIGATION MEASURES

The proposed use of a maximum amount of 1,000 acre feet of water per year from the Smith River is not expected to cause a significant effect on the resources of this river so no mitigation measures are required.

UTILITIES REFERENCES

R-1/ The information in this section was taken from Norte and Associates, Final Technical Reports for the EAS, proposed State Prison - Del Norte County, July 1986, Section Numbers 2, 3, 4, 5 and 6.

J. ARCHAEOLOGY

ENVIRONMENTAL SETTING

Introduction

A cultural resource assessment for the proposed prison site was prepared by Janet P. Eidsness and James M. Roscoe, archaeologists with the Sonoma State University Anthropological Studies Center. Archaeological surveys for this project covered the entire Malarkey Forest site, two alternative alignments of the proposed wastewater effluent interceptor, and the rapid infiltration site on the Strahm Lily farm north of the prison site. The assessment of the lands directly affected by the subject project included a survey of existing literature, reviews of archaeological records, interviews with local Native American representatives, and site walk-overs.R-1, 2/

Record searches performed at the Northwest Information Center of the California Archaeological Inventory indicated that the Malarkey Forest site has not been previously surveyed. There were also no records of previous archaeological surveys or known sites in the Kings Valley area within which the site is located. However, there were records of over 30 cultural resources surveys that had been performed within 5 miles of the project site. Based upon these and other studies, the majority of known prehistoric sites in the project vicinity occur along the coastal strip and the banks of the Smith River. Subsequent surveys for the infiltration basins and pipeline corridors indicated the presence of two historical sites.

Ethnographic/Historical Overview

The Malarkey Forest and rapid infiltration basin parcels are located within the area that was controlled by the Tolowa Indians. The Tolowa territory comprised an area of approximately 640 square miles, extending along the coast from the mouth of the Winchuck River in extreme southern Oregon southward to the mouth of Wilson Creek. This territory encompassed the entire Smith River watershed.

Like their neighbors, the Tolowa utilized seasonally available resources, exploiting them in a cyclical pattern. Of the four main habitats contained

within their territory, the coastal strip was the primary focus of activities since it provided an abundant year-round supply of shellfish, sea mammals, fish, shorebirds, and edible seaweed. Primary villages, numbering eight at the time of historic contact in 1828, were situated within this coastal habitat. These sites included three on the coast in and near present-day Crescent City, two coastal sites south of Crescent City, one on the west shore of Lake Earl, and two near the mouth of the Smith River.

The entire population generally occupied the principal coastal zone villages except during the late summer and fall when families fished for smelt or moved inland to collect acorns and catch salmon. Several seasonal village sites have been identified along the Smith River and its tributaries. Most gathering and hunting activities occurred within a 10 to 15 mile radius of the principal villages.

Situated among the low hills bordering the coastal strip, the redwood forest habitat was generally poor in food resources other than elk and deer. Redwood forest did provide a source of material for plank houses and canoes, as well as ferns used in basketry.

Tolowa Indian populations dropped rapidly beginning in the mid-1800's during the period of contact with the new Euro-American settlers. The decrease in populations is attributed to the introduction of new diseases, loss of native lands, and Euro-American violence. Two rancherias were established in the Del Norte area around 1908. Although these rancherias were terminated in the mid-1960's, Native Americans continue to live at these and other sites in the Del Norte County area.

The Crescent City area was first settled on a permanent basis by Euro-Americans in 1853, although the area had been subject to earlier explorations by various European and American naval expeditions and fur trappers. The area's population had its most significant increase during the California Gold Rush. During this period, Crescent City became an established port and shipping center for mining camps in southern Oregon and Northeastern California.

The first sawmill was established in Del Norte County in 1853. The production of timber particularly increased during the 1870's with the formation of the

Crescent City Mill and Transportation Company. A large steam sawmill was constructed on Lake Earl two miles north of Crescent City with the lake being used as a log pond. The mill was linked to the Crescent City Wharf by railroad allowing for the export of lumber by sea from the region. In 1879, the Lake Earl Mill turned out 3.5 million board feet of lumber.

In 1871, the Hobbs, Pomeroy and Company incorporated to start another large lumber operation in the Del Norte County area. This company (later Hobbs, Wall and Company) eventually bought out the Lake Earl operation in the early 1900's, becoming the dominant economic force in the County. Lumber production during this period was several million board feet a year.

The Hobbs, Wall and Company operation had a railroad line that extended up to the Smith River near the community of Fort Dick. A portion of the railroad's original right-of-way is located east of Kings Valley Road. Logging camps were established along this line, including one approximately a mile northeast of the prison site on the portion of the old alignment that turns away from Kings Valley Road towards the river. A second historic structure, the "Myrtle Grove" train station, was also located in this area at a junction in the railroad near present-day South Bank Road.

The Hobbs, Wall and Company lumber operations closed down completely in 1939, ending an era of steam engine logging in the Del Norte County area. Logging has continued, however, as an important industry in this region.

The Malarkey Forest site is located near the community of Fort Dick, a farming and rural residential area. Although logging activities were widespread in the Lake Earl area in the late 1800's and early 1900's, the old growth redwood timber on the project site was apparently not logged until the 1950's.

Project Site Survey

The initial field surveys of the Malarkey Forest site were done in May 1986 by the two project archaeologists. Subsequent on-site surveys were made in October and November 1986 of the potential rapid infiltration site and the alternative corridors for the effluent interceptor. One of the two potential effluent interceptor corridors will also contain a parallel water pipeline.

No cultural resources were found or are expected to occur on the Malarkey Forest site. Local Native Americans that were contacted during the survey also indicated that they knew of no cultural resource sites of significance to the local Indian community on this site. There are no known historical sites on the Malarkey Forest parcel.

The survey of the rapid infiltration basin site revealed that there could be either cultural resources or historical artifacts present below the present ground surface. The basin site is situated near the Smith River. Seasonal Tolowa campsites are reported to occur both up and downstream from the property. While the surface of this site has been disrupted by land clearing for agricultural use and there are no recorded sites on this land, there is a possibility that prehistoric materials might be encountered during site excavations. These materials would include, but are not limited to, obsidian and chert flaking debris or artifacts, stone mortars, flat milling slabs, animal bones, shellfish, middens, or human bones.R-3/

Historical records for this area indicate that the basin site is near the edge of the Myrtle Grove railroad station site. While no surface remains are apparent in this area, subsurface excavations may yield historic artifacts such as bottles, cans, and remains of foundation materials.

The alternative pipeline corridor that follows Lake Earl Drive to South Bank Road is not reported to contain any prehistoric or historic sites that would be disturbed by excavation for a pipeline.

The other alternative pipeline corridor, which would contain both the pipeline to the City's pump station on the Smith River and the wastewater interceptor pass, through an area known to be the site of an old Hobbs, Wall and Company logging camp. Portions of this corridor also follow an old railroad alignment that parallels Kings Valley Road to the east of the project site.

Where Kings Valley Road turns west towards Fort Dick, the old rail line turns northeast towards the Smith River. The existing dirt road that the pipeline corridor follows is on the old bed of the railroad. The City's waterline from its pumping facility on the Smith River also follows this dirt road.

If excavations for the proposed pipeline occur outside of the railroad bed where it passes through the site of the logging camp, it is possible that old dumps or foundation materials may be encountered.

ENVIRONMENTAL EFFECTS

Since there are no known archaeological or historical sites on the Malarkey Forest parcel, construction of the proposed prison is not expected to affect any cultural resources.

There is a possibility that various archaeological or historical artifacts could be encountered in portions of the areas that could be excavated for the effluent and water pipelines and at the infiltration basin site.

MITIGATION MEASURES

To mitigate the potential loss of artifacts that could be unearthed during trenching and other excavation activities, the Department will require that a qualified archaeologist be present during certain phases of the project. These phases include the grading of the infiltration basins and the trenching for pipelines along the old railroad line east of Fort Dick. A qualified archaeologist will be available to inspect and recommend appropriate recovery methods for any materials excavated during construction of the project that appear to have archaeological or historical significance.

ARCHAEOLOGICAL REFERENCES

R-1/ James M. Roscoe and Janet P. Eidsness, Sonoma State University Anthropological Studies Center, Archaeological Survey of Two Alternative State Prison Facility Sites Near Crescent City, Del Norte County, California, July 1986.

R-2/ Janet P. Eidsness, Sonoma State University Anthropological Studies Center, Archaeological Study of the Proposed 26.24-acre Sewage Disposal Site for the Proposed State Prison Facility in Del Norte County, California, October 27, 1986.

R-3/ Personal Communication, Janet P. Eidsness, concerning the results of archaeological survey of alternative wastewater interceptor routes for the Malarkey Forest prison site, November 6, 1986.

K. ENERGY

ENVIRONMENTAL SETTING

There are no structures or facilities located on the project site so no electrical and thermal energy expenditures presently occur on the Malarkey Forest parcel. The rapid infiltration basin also contains no structures. However, a minimal amount of fuel is expended on this parcel for farming activities.R-1/

ENVIRONMENTAL EFFECTS

Construction of the proposed prison will result in the expenditure of a relatively small amount of fossil fuels for tractor and vehicle operation. However, adequate amounts of diesel fuel and gasoline are available in the project area to serve these uses.

Operation of the prison and its associated facilities is expected to result in a peak electrical energy demand of approximately 10 megawatts. No natural gas is available in the project area.

The electrical energy needs of the proposed prison can be met through the purchase of energy from the Pacific Power and Light Company. The increased demand for electricity in the project area is not expected to effect other current users in the Del Norte County area.

Prison-related transportation will increase fuel consumption due to the vehicle miles traveled by employee, vendor, visitor, and prison vehicles. Under the worst case situation of the prison operating at 190 percent of design occupancy, the project would result in approximately 920,000 vehicle miles being traveled annually. The majority of these miles would be by private automobile, although buses, light trucks, and motorcycles would also contribute to this total. The estimated annual fuel consumption of the prison-related traffic (assuming an average of approximately 15 gallons per mile) would be approximately 61,000 gallons of gasoline or approximately 7,800 million BTUs.R-2/

Fuel consumption related to site clearing, prison construction, prison operation, and prison-related traffic is an unavoidable effect of the project.

The availability of fuel supplies and vendors, however, is adequate to insure that this increased demand does not effect other users in the Del Norte County area. Because of the availability of fuel and electricity in the project area, the proposed prison is expected to have a minimal effect on other current energy users.

MITIGATION MEASURES

The proposed prison will be designed, where possible, to reduce electrical usage. Mitigation measures that will be considered to help reduce electrical usage include:

Insulation of the roof and walls to reduce heating and cooling loads.

Use of weatherstripping on the doors and windows.

Use of energy-efficient lighting and motors.

The following measures would help decrease fuel energy use due to prison-related transportation:

Encouraging the use of carpools by prison employees.

Encouraging the development of public transportation to serve the prison site from surrounding communities.

ENERGY REFERENCES

R-1/ Information in this section is taken from a study prepared by Nolte and Associates, Final Technical Reports for the EAS, California State Prison - Del Norte County, July 1986, Section 13.

R-2/ BTU or British Thermal Unit: A standard unit for measuring heat. One gallon of gasoline is equivalent to 127,700 BTU.

APPENDIX 1

PLANT AND ANIMAL SPECIES OBSERVED

ON MALARKEY FOREST SITE - JULY 1986

LIST OF VASCULAR PLANT SPECIES OCCURRING ON MALARKEY SITE *

Achillea millefolium
Aira caryophyllea
R Alnus rubra
Anagallis arvensis
Anaphalis margaritacea
Anthoxanthum odoratum
Asarum caudatum
R Athyrium filix-femina

Baccharis pilularis
Bellis perennis
Blechnum spicant
R Botrychium multifidum
Briza maxima

Calandrinia ciliata
R Callitriche species
Cardamine oligosperma
R Carex obnupta
R Carex species
Cerastium arvense
Cirsium canadensis
Cirsium vulgare
Claytonia perfoliata
Claytonia sibirica
Collomia heterophylla
Conyza canadensis
Crepis attenuata

Daucus carota
Dianthus armeria
Dicentra formosa
Digitalis purpurea
Disporum hookeri
Dryopteris spinulosa

Epilobium ciliatum
R Equisetum telmateia
Erechtites arguta
Erechtites minima
Erodium cicutarium
Euphorbia peplus

Festuca arundinacea
Fragaria chiloensis

Galium aparine
Gaultheria shallon
Geranium dissectum
Gnaphalium purpurea
Gnaphalium species
Gratiola ebracteata

Holcus lanatus
R Hypericum anagalloides
Hypericum perforatum

VASCULAR PLANTS OCCURRING ON MALARKEY SITE - cont'd

R Juncus bufonius
R Juncus falcatus

Leontodon taraxacoides
Leucanthemum vulgare
Linum bienne
Lonicera involucrata
Lotus purshianus
Lupinus rivularis
Luzula subsessilis
R Lysichiton americanum

Maianthemum dilatatum
Malus fusca
Marah oreganus
Medicago minima
Medicago polymorpha
Menziesia ferruginea
Myrica californica

Oemleria cerasiformis
R Oenanthe sarmentosa
Oxalis rubra

Parentucellia viscosa
Philadelphus californicus
Physocarpus capitatus
Picea sitchensis
Pinus radiata X attenuata
Plectritis species
Poa annua
Poa pratensis
R Polygonum species
Polystichum munitum
Prunella vulgaris
Prunus emarginata
Pseudotsuga menziesii
Pteridium aquilinum

R Ranunculus flammula
Ranunculus occidentalis
Ranunculus repens
Raphanus sativa
Rhamnus purshiana
Rhododendron occidentale
R Ribes bracteosum
R Ribes laxiflorum
Ribes sanguineum
Rosa canina
Rubus discolor
Rubus parviflorus
Rubus spectabilis
Rubus ursinus
Rumex crispus

VASCULAR PLANTS OCCURRING ON MALARKEY SITE - cont'd

	Sagina procumbens
	Salix hookeriana
	Salix lasiandra
	Salix sitchensis
	Sambucus pubens
	Scrophularia californica
	Senecio vulgaris
	Sequoia sempervirens
	Silene gallica
	Sisyrinchium bellum
R	*Sisyrinchium californicum*
	Sonchus oleracea
	Spergula arvensis
R	*Spiraea douglasii*
	Stachys chamissonis
	Thuja plicata
	Trientalis latifolia
	Trifolium rubens
	Trifolium subterraneum
	Trillium ovatum
	Tsuga heterophylla
R	*Typha latifolia*
	Vaccinium ovatum
	Vaccinium parvifolium
R	*Veronica americana*
	Vicia americana
	Viola sempervirens

R = wet site (creekside or depressions)

* nomenclature follows "Checklist of Vascular Plants in Northwest California." by J.P. Smith and J.O. Sawyer, Dept. of Biol. Sciences, HSU Arcata CA 8th edition, 1986.

BIRDS OF MALARKEY FOREST SITE

Species	Habitat	Abundance	Seasonal Occurrence
Turkey vulture	W	C	s, m
Osprey	W	U	s
Red-shouldered hawk	W	U	r
Ruffed grouse	W	R	r
California quail	W	C	r
Killdeer	W	U	r, m
Band-tailed pigeon	W	C	s
Mourning dove	W	C	s
Western screech owl	F	R	r
Northern sar-whet owl	F	R	r
Vaux's swift	W	C	s
Allen's hummingbird	W	C	s
Hairy woodpecker	F	U	r
Western flycatcher	W	C	s
Western kingbird	W	R	m
Purple martin	F	U	s
Stellar's jay	F	C	r
Common raven	F	U	r
Chestnut-backed chickadee	F	C	r
Red-breasted nuthatch	F	C	r
Brown creeper	F	C	r
Winter wren	F	C	r
Golden-crowned kinglet	F	C	r
Ruby-crowned kinglet	F	C	w
Wrentit	R	C	r
American robin	W	C	w, r
Cedar waxwing	F	C	s
Hutton's vireo	F	U	r
Orange-crowned warbler	F	C	s, m
Yellow-rumped warbler	F	C	m, w
Townsend's warbler	F	U	m, w
Hermit warbler	F	U	s
Wilson's warbler	W	C	s
Rofous-sided towhee	R	U	w
Fox sparrow	R	U	w
Golden-crowned sparrow	R	R	w
White-crowned sparrow	W	C	r
Dark-eyed junco	W	C	w
Purple finch	W	C	r
Red crossbill	F	U	r
Song sparrow	F	C	r
Introduced Species			
European starling	W	C	r

Standard names and order of listing follows that of the American Ornithologists Union Checklist of North American Birds 6th ed. 1983.

Explanation of Symbols for Birds of Malarkey Forest Site

Habitat
F = forest
R = swampy areas
W = wide-ranging species

Relative Abundance
C = common
U = uncommon
R = rarely encountered

Seasonal Occurrence
r = resident
s = summer breeder
m = migrant
w = wintering species

REPTILES AND AMPHIBIANS OF THE MALARKEY FOREST SITE

Pacific giant salamander	(*Dicamptodon ensatus*)
Northwestern salamander	(*Ambystoma gracile*)
Olympic salamander	(*Rhyacotriton olympicus*)
Rough-skinned newt	(*Taricha granulosa*)
Ensatina	(*Ensatina eschscholtzi*)
Del Norte salamander	(*Plethodon elongatus*)
California slender salamander	(*Batrachoseps attenuatus*)
Clouded salamander	(*Aneides ferreus*)
Tailed frog	(*Ascaphus truei*)
Western toad	(*Bufo boreus*)
Pacific tree frog	(*Nyla regilla*)
Red-legged frog	(*Rana aurora*)
Yellow-legged frog	(*Rana boylei*)
Western fence lizard	
Western skink	(*Eumeces skiltonianus*)
Southern alligator lizard	(*Gerrhonotus multicarinatus*)
Northern alligator lizard	(*Gerrhonotus coeluleus*)
Rubber boa	(*Charina bottae*)
Gopher snake	(*Pituophis melanoleucus*)
Common garter snake	(*Thamnophis sirtalis*)
Western terrestrial garter snake	(*Thamnophis elegans*)
Western aquatic garter snake	(*Thamnophis couchi*)
Northwestern garter snake	(*Thamnophis ordinoides*)

Source: *A Field Guide to Western Reptiles and Amphibians* Robert C. Stebbins. Houghton Mifflin Company, Boston 1966.

MAMMALS OF THE MALARKEY FOREST SITE

Opossum	(*Didelphus marsupialis*)
Trowbridge shrew	(*Sorex trowbridgei*)
Vagrant shrew	(*Sorex vagrans*)
Pacific shrew	(*Sorex pacificus*)
Shrew-mole	(*Neurotrichus gibbsi*)
Pacific mole	(*Scapanus orarius*)
Yuma myotis	(*Myotis yumanensis*)
California myotis	(*Myotis californicus*)
Hoary bat	(*Lasiurus cinereus*)
Black bear	(*Ursus americanus*)
Raccoon	(*Procyon lotor*)
Long-tailed weasel	(*Mustela frenata*)
Spotted skunk	(*Spilogala putorius*)
Striped skunk	(*Mephitis mephitis*)
Coyote	(*Canis latrans*)
Gray fox	(*Urocyon cinereoargenteus*)
Mountain beaver	(*Aplodontia rufa*)
Beechy ground squirrel	(*Citellus beecheyi*)
Townsend's chipmunk	(*Eutamias townsendii*)
Douglas squirrel	(*Tamiasciurus douglasii*)
Northern flying squirrel	(*Glaucomys sabrinus*)
Beaver	(*Castor canadensis*)
Deer mouse	(*Peromyscus maniculatus*)
Bushytail woodrat	(*Neotoma cinerea*)
California redback vole	(*Clethrionomys occidentalis*)
Oregon vole	(*Microtus oregoni*)
Pacific jumping mouse	(*Zapus trinotatus*)
Brush rabbit	(*Sylvilagus bachmani*)
Black-tailed deer	(*Oducoileus hemionus*)

Source: *A Field Guide to the Mammals* Burt, William H. & Richard P. Grossenheider. Houghton Mifflin Company, Boston 1976.