

6.3 SOILS, GEOLOGY, TOPOGRAPHY, AND SEISMICITY

6.3.1 Introduction

This analysis is based on the Soils Baseline Study of Fort Ord, California (U.S. Army Corps of Engineers, Sacramento District 1992d); the Other Physical Attributes Baseline Study of Fort Ord, California (U.S. Army Corps of Engineers, Sacramento District 1992e); the Soil Survey of Monterey County, reports and publications of the U.S. Geological Survey and the California State Division of Mines and Geology, and other government and private sector documents. Other sources of information include conversations with Army personnel, limited on-site reconnaissance, and standard practices in the fields of geology and soil science.

This analysis assumes the proposed action and Alternative 6R would have a substantial effect if it resulted in:

- degradation of a soil type that is an ecosystem component of a distinct natural habitat of limited extent and that supports rare and endangered plant and animal species;
- vegetation removal or soil surface disturbance that would increase wind erodibility;
- accelerated rates of water-induced soil erosion;
- loss of facilities due to coastal erosion;
- sedimentation of water bodies or land deposition of transported sediment;
- exposure of structures or property to geologic hazards, including seismic ground shaking and landslides;
- overall decline in soil fertility resulting from exclusion of wildfire from fire-dependent ecosystems; or
- use of unsuitable soil or substrate types for buildings, roads, and all other engineering works.

6.3.2 Disposal Impacts

There would be no soil, geologic, topographic, or seismic effects resulting from disposal.

6.3.3 Reuse Impacts

Soil/Geologic Ecosystem Relationships

- *Impact: Loss of Soil Component of the Natural Ecosystem*

Substantial areas of proposed new development would result in the disturbance or loss of the soil substrate as a component of the natural ecosystem supporting natural habitats and rare plant communities (refer to Section 6.11, "Vegetation, Wildlife, and Wetland Resources", for more information), through grading, excavation, contouring, paving, landscaping, etc. Areas affected include 337 acres of the office park, 19.5 acres of the corporation yard, 29 acres of the community park, 97 acres of the fairgrounds, 223 acres of the agri-center, 20+ acres of the recreation area expansion, 300 acres of the university, and 500 acres of the university research area and university science office. Additional areas include the 1,000-foot-wide

transportation corridor and the two 500-foot airport runway extensions and may include portions of the fire training area, POST Academy, transit center, multi-use area, and service area. Portions of the natural resource management area and the no proposed use areas may be subject to future similar impacts presently unspecified.

- ***Mitigation: Avoid Disturbance and Preserve Soil***

Disturbance could be avoided by limiting development to existing urban areas and degraded open space and preserving the soil component of the remaining natural ecosystem to maintain a suitable substrate for natural habitats and rare plant communities. Mitigation by creation of suitable natural habitat on dissimilar soil types elsewhere is generally infeasible due to the uniqueness of soil types and environmental factors found on Fort Ord. Restoration of existing degraded habitat on suitable yet disturbed soil types could be attempted but the feasibility has not been demonstrated. (Various government natural resource agencies, such as the U.S. Bureau of Land Management, U.S. Fish and Wildlife Service, California Department of Parks and Recreation, California Department of Fish and Game, or private organizations such as The Nature Conservancy)

- ***Impact: Long-term Loss of Soil Fertility***

The suppression of low-temperature natural wildfires resulting in a build-up of fuel and eventual high-temperature wildfire could severely deplete the soil surface horizon reserve of organic matter. In sandy soils such as Oceano, Baywood, and Arnold series with very low clay content, organic matter represents the primary reserve of soil fertility and its loss could severely reduce the soil's ability to support rare plant communities. This reduced ability could result from the suspension of the controlled burns of the current fire management program (U.S. Army Corps of Engineers, Sacramento District 1992a). This impact would primarily pertain to the natural resource management area, but would also pertain to presently undeveloped no proposed use and other areas, and remaining natural areas within areas of future development.

- ***Mitigation: Preserve the Fire Management Program***

The existing controlled-burn fire management program could be continued and expanded to reduce fuel-loading and the potential for a high-temperature, soil-depleting wildfire. (U.S. Bureau of Land Management, California Department of Forestry and Fire Protection, or a local fire department or district)

Erosion

- ***Impact: Loss of Coastal Facilities***

The potential reuse of Stilwell Hall as a visitor's center in the multi-use area could be affected by the loss of the facility because of the rapid rate of coastal erosion. The service area may eventually be similarly affected.

- ***Mitigation: Evaluate Reuse in Master Plan***

The State Department of Parks and Recreation will prepare a master plan for the coastal area that will evaluate the feasibility of maintenance of Stilwell Hall for reuse, relocation of Stilwell Hall, or construction of a new visitor's center and other facilities inland.

- ***Impact: Accelerated Wind Erosion***

Soil surface disturbance and removal of vegetation from relatively undisturbed areas would result in an increased hazard of wind erosion of the predominately sandy and poorly aggregated soils of Fort Ord,

specifically the Baywood, Oceano, and Arnold series. Areas most likely to be affected include the extension of the airport runway, the university, university research areas, university science office, agri-center, transportation corridor, transit center, office park, fairgrounds, and corporation yard. Additional areas may also be affected depending on the extent of future development. Wind erosion and blowing sand may impact aviation use of the airport and damage existing vegetation and existing structures in all areas.

- ***Mitigation: Restore Soil Cover through Revegetation***

Potential wind erosion areas could be revegetated. Revegetation is the most effective means of reducing wind erosion impacts. Revegetation may be hindered by the instability of the wind-eroding soil surface, very low water-holding capacity of the sandy soils, and damage to young plants from blowing sand. Iceplant has been used successfully for revegetation at Fort Ord and has the advantage of requiring little water; however, it provides poor habitat for special-status species. Once the soil surface has stabilized, additional wind erosion protection is provided by planting trees that can grow in the sandy soils and serve as windbreaks, such as the native Monterey pine and Monterey cypress. Kikuyu grass has also been used to control wind erosion, but the aggressive growth habit of this introduced species can cause damage to structures. Native vegetation is preferred for restoration and should be used wherever feasible. (Local agencies and private entities responsible for development)

- ***Impact: Accelerated Water Erosion***

Proposed development on moderate to highly erodible lands (Figure 4.3-3 in Section 4.3) and on steep slopes ranging from 15% to nearly vertical in a few places (Figure 4.3-14 in Section 4.3) would necessitate the removal of vegetation, disruption and excavation of the soil surface, and concentration and redirection of runoff. This would result in greatly accelerated water-induced soil erosion that would cause environmental damage and ultimately be a hazard to the stability of the proposed developments. This impact especially pertains to the transportation corridor. Existing road construction in the same area has resulted in extremely severe ongoing erosion (Section 4.3.2.3 and Figures 4.3-4 and 4.3-6). Other areas such as the natural resource management area, agri-center, fire training area, POST academy, recreation area expansion, office park, corporation yard, community park, and fairgrounds may be impacted to a lesser extent.

- ***Mitigation: Implement Erosion-Control Structures***

New construction in highly water erosion susceptible areas, specifically the transportation corridor, would require minimal and carefully designed surface disturbance, paving of road and other bare surfaces, construction of paved drainage ditches, conveyance of runoff to nonsloped areas, and timely revegetation of disturbed areas. Existing severe gully erosion that threatens reuse must be mitigated with headcut repair techniques including runoff diversion, shaping, rock riprap, and revegetation. Gully downcutting must be mitigated with checkdams, drop inlets, and revegetation. Some areas of erosion are so severe that restoration will be costly and of uncertain success; therefore the mitigation may be infeasible and does not completely mitigate the impact. The alternative is the continued expansion of badlands. (California Department of Transportation, U.S. Bureau of Land Management, other government agencies, new property owners, and their contractors, with assistance from the U.S. Department of Agriculture (USDA) Soil Conservation Service)

- ***Impact: Increased Landslide Susceptibility***

Proposed development in areas of recent and active landslides, particularly the transportation corridor, are susceptible to damage and loss from existing and potential landslides, both rainfall and seismically induced. Other proposed developments identified above under the accelerated water erosion

impact may also be subject to landslides. The potential reuse of Stilwell Hall as a visitor's center may also be impacted by a seismically induced landslide potential along the coastal dune cliff face.

- ***Mitigation: Implement Landslide Stabilization Measures***

Landslide stabilization measures that could be implemented include head excavation, buttressing, subsurface drainage on active landslides, and redirection of surface runoff, subsurface drainage, removal of unstable earth materials, and slope reduction on areas of potential landslides. This mitigation would be costly, unreliable, and potentially infeasible; it does not completely mitigate the impact. Development should be avoided on steep slopes highly susceptible to landslides. (California Department of Transportation, U.S. Bureau of Land Management, other government agencies, new property owners, and their contractors, with assistance from the USDA Soil Conservation Service)

- ***Impact: Increased Sedimentation and Flood Hazard***

Increased water erosion and landslide susceptibility as a result of proposed developments would result in increased creek channel sedimentation downslope and downstream of the developments. The primary impact would be from the transportation corridor; other potential source areas of impact would be the natural resource management area, agri-center, fire training area, POST academy, recreation area expansion, office park, corporation yard, community park, and fairgrounds. Affected creeks would include those in Impossible Canyon, Barloy Canyon, Pilarcitos Canyon, other smaller drainages in the southeast quadrant of Fort Ord, and the small drainage near the southwestern boundary of Fort Ord. Most affected would be Toro Creek, where current sedimentation is increasing the potential flood hazard to existing developments.

- ***Mitigation: Implement Sediment-Control Structures***

Constructing sediment-control structures, such as sediment traps and basins, straw bale barriers, and silt fences could be employed to reduce sediment loss from construction sites. Sources of existing sedimentation could be controlled with check dams and revegetation. Water erosion and landslide mitigation measures described above would also mitigate increased sedimentation. (California Department of Transportation, U.S. Bureau of Land Management, other government agencies, new property owners, and their contractors, with assistance from the USDA Soil Conservation Service)

Engineering Uses

- ***Impact: Severe Engineering Limitations Because of Use of Low Strength and Shrink-Swell Soils***

The transportation corridor crosses mapped areas of Santa Ynez and Diablo soil series, soils with high shrink-swell clay contents in the subsoil or throughout the profile that have severe limitations to engineering use due to low strength and shrink-swell properties (Figures 4.3-15 and 4.3-16 in Section 4.3).

- ***Mitigation: Implement Appropriate Engineering Techniques***

Engineering design techniques appropriate for low strength and shrink-swell soil limitations could be employed on Santa Ynez and Diablo soils include barriers to water infiltration and evaporation, removal of constraining soil materials, and deep foundation support could be implemented. While such techniques are feasible, a severe limitation rating implies a major increase in construction effort, design, cost, and maintenance. The high potential for erosion, landslides, and sedimentation as a direct consequence of road construction on the mapped areas of Santa Ynez and Diablo soils together with low strength and shrink-swell limitations, would make such a development costly and hazardous. Site specific soil and geologic investigation must be conducted before any development is undertaken. (California Department of Transportation)

- **Impact: Severe Engineering Limitations Because of Use of Sandy, Unaggregated Soils**

Areas of proposed new development on Baywood, Oceano, and Arnold soil series, sandy soils with weak or no aggregation, have severe limitations to engineering use due to excavation caving and slope and embankment piping potential (Figure 4.3-17 in Section 4.3).

- **Mitigation: Implement Appropriate Engineering Techniques**

On the Oceano, Baywood, and Arnold soils, mitigation for excavation and piping potential could include excavation-supporting structures, and embankment avoidance or drainage redirection. Such mitigation is feasible. (Other federal, state, and local agencies and private entities responsible for development)

Seismicity

- **Impact: Susceptibility of Existing and New Structures to Damage from Ground Shaking**

All new construction on Fort Ord and all reused existing structures would be subject to a moderately high to very high ground shaking potential.

- **Mitigation: Construct New or Modify Existing Structures to Meet Building Codes**

To limit susceptibility of structural damage, new structures could be built and existing structures could be modified to meet current building codes for seismic safety. Existing buildings may require structural modification depending on reuse. A specific review of each building could be conducted to determine the status of compliance with current building codes. This review could also require structural analysis of buildings by qualified engineers to determine the extent of necessary modifications. New building construction would be required to comply with seismic codes. However, this does not fully mitigate the impact of structural damage from ground shaking. (Other federal, state, and local agencies and private entities responsible for development)

6.3.4 Cumulative Effects

There would be two cumulative effects on soils from disposal and reuse of Fort Ord. The first is accelerated water erosion and downstream sedimentation from soils of the Aromas and Paso Robles formations on Fort Ord combined with existing severe erosion and the present extensive loss of the soil natural resource. This cumulative effect would have the most impact on Toro Creek with other smaller creeks also impacted. The second cumulative impact is the loss of rare soil types that support natural habitats of limited extent and rare and endangered plant and animal species. Areas of occurrence of these soil types outside of Fort Ord are already substantially impacted; additional loss or alteration of the natural soil resource on Fort Ord further reduces the total available to support natural habitats.

The relative ranking of Alternatives 1 through 6R for cumulative effects runs sequentially as Alternatives 1, 2, 4, 6R, 3, and 5, with Alternative 1 having the most and Alternative 5 having the least effects.

6.3.5 Summary Comparison of Reuse Alternatives

The relative ranking of Alternatives 1 through 6R for total impacts runs sequentially as Alternatives 1, 2, 4, 6R, 3, and 5 with Alternative 1 having the most effects and Alternative 5 having the least effects.

6.4 PUBLIC SERVICES AND UTILITIES

6.4.1 Wastewater

6.4.1.1 Introduction

Wastewater impacts were assessed based chiefly on information in the Fort Ord Task Force report on water, sewer, and solid waste (Fort Ord Task Force, Sewer and Solid Waste Committee 1992) and the Other Physical Attributes Baseline Study of Fort Ord, California (U.S. Army Corps of Engineers, Sacramento District 1992e). Other information was gathered from the Monterey Regional Water Pollution Control Agency (MRWPCA).

The following assumptions have been made for this analysis:

- Wastewater generation has historically been approximately 51% of groundwater pumped for potable use. For the purposes of this analysis, each proposed land use was assigned an expected wastewater generation rate based on the percentage of potable water use. Table J-1 in Appendix J (Volume IV, Section 6.0) describes the methodology used to calculate the wastewater that would be generated by the proposed land uses under each reuse alternative.
- Wastewater collection system maintenance by the Army would be performed only on facilities needed to serve Army uses.
- The regional wastewater treatment plant has a capacity of 29.6 million gallons per day (mgd), is permitted to treat 27 mgd, and receives an average of 20 mgd. Fort Ord has purchased 3.3 mgd of treatment capacity.
- The existing 3.3 mgd of MRWPCA regional wastewater treatment plant capacity that was purchased by Fort Ord would be retained through interim use. The purchased capacity may be transferred or sold subject to the review and approval of the contractor (Monterey Regional Water Pollution Control Agency pers. comm.) during disposal (Table 6.4-1).
- The MRWPCA, Marina County Water District, Seaside County Sanitary District, county service area, a future wastewater service agency, or developers could be responsible for treating the wastewater generated by reuse.
- Table 6.4-1 provides information on the estimated total wastewater flow including flows generated by the reuse alternatives. The table also provides information on the necessary additional allocation beyond the current 3.3 mgd and the total additional capacity needed to meet the estimated total wastewater flow into the MRWPCA treatment plant in Marina at buildout of the reuse alternatives.
- Allocation of wastewater treatment capacity can be approved only if the project is consistent with the 1991 Air Quality Management Plan for the Monterey Bay Region. Refer to Section II.8, "Air Quality", in Volume II for more information. (Monterey Regional Water Pollution Control Agency pers. comm.)

This analysis assumes the proposed action and Alternative 6R would have a substantial effect if it resulted in:

- a need for substantial expansion of wastewater treatment plant and collection capacity or alteration of the existing system;
- a substantial disruption to existing wastewater service; or
- a violation of national, state, or local wastewater standards.

Table 6.4-1 Estimated Total Wastewater Flow and Necessary Capacity

Reuse Alternative	Expected Wastewater Generation	Additional Allocation Needed ^a	Total Wastewater Flow ^b	Additional Capacity Needed ^c
1	19.5	16.2	37.1	10.1
2	13.1	9.8	30.7	3.7
3	8.9	5.6	26.5	(0.5)
4	7.7	4.4	25.3	(1.7)
5	1.7	(1.6)	19.3	(7.7)
6R	5.0	1.7	22.6	(4.4)

Notes: The regional wastewater treatment facility has a total capacity of 27 mgd. The facility is currently treating 20 mgd, leaving 7 mgd of available capacity. Fort Ord has been allocated 3.3 mgd of which the installation used only 2.4 mgd, leaving 0.9 mgd of wastewater treatment allocation available for Fort Ord uses. The 3.3 mgd that has been allocated to Fort Ord may be transferred upon sale to the new landowner(s) or sold, subject to review and approval of the contractor.

All numbers are in million gallons per day.

- ^a This represents the additional wastewater treatment allocation necessary to provide wastewater treatment to the reuse alternatives above the 3.3 mgd already allocated to Fort Ord.
- ^b This represents the total wastewater flow of the reuse alternative plus the 17.6 mgd of wastewater flow from all other uses.
- ^c This represents the additional wastewater treatment capacity necessary to provide wastewater treatment to the reuse alternatives above the 27-mgd capacity of the facility.

6.4.1.2 Disposal Impacts

- ***Impact: Inadequate Access to Maintain Wastewater Collection Facilities***

Issuing leases or outgrants to interim land uses could restrict access to wastewater pump stations, collection lines, and other facilities necessary to provide wastewater collection service to the POM annex, reserve center, and other interim land uses. Access is necessary to maintain these facilities.

Loss of access could have a substantial effect because without maintenance, wastewater facilities could degrade, resulting in violations of federal, state, or local standards related to wastewater disposal.

- ***Mitigation: Provide for Public Utilities Easements***

Public utilities easements will be written into leases and outgrants to ensure that access to wastewater collection facilities would be maintained to provide service to the POM annex and reserve center. (Army)

This is considered feasible mitigation for this impact. There are no adverse environmental impacts associated with this mitigation measure.

- ***Impact: Need for Expansion of the Wastewater Collection System***

Interim uses could generate a substantial quantity of wastewater, exceeding the capacity of nearby sewer mains and pump stations and creating a need for additional capacity in the wastewater collection system. Expansions and upgrades of the system could be expensive.

- ***Mitigation: Prepare and Implement a Wastewater Master Plan***

A wastewater master plan could be prepared before allowing interim uses. The plan could identify necessary upgrades for reusable facilities, facilities that need to be replaced, and new facilities that would be necessary to serve the interim land uses. The plan could also indicate how the facilities would be funded. Funding mechanisms could include connection and user fees, community facilities districts, or other mechanisms. (Monterey County Local Agency Formation Commission or other local agency or a new agency created for this purpose)

This is considered feasible mitigation for this impact. There are no adverse environmental impacts associated with this mitigation measure.

- ***Impact: Potential Degradation of Wastewater Service to Areas outside of the Presidio of Monterey Annex and Reserve Center***

Wastewater facilities serving the POM annex and reserve center would be maintained by Army personnel or a contracted entity. However, a reduction in wastewater collection system maintenance and decreased flows in the system outside the POM annex and reserve center after disposal could allow these wastewater collection facilities to degrade enough to render service inadequate. Degradation of the system could occur from the mechanisms discussed above. Some of these problems may exist presently because of the limited capabilities of the existing maintenance personnel.

Degradation of the wastewater collection system after disposal could result in violations of federal, state, or local wastewater standards.

- **Mitigation: Maintain Facilities to Collect Wastewater from Areas Outside of the Presidio of Monterey Annex and Reserve Center**

The system of pipes, pump stations, and other facilities that are necessary to collect wastewater from the POM annex and reserve center and pump it to the MRWPCA's regional treatment plant, will be maintained and upgraded (as necessary). A service inventory of the elements of the system outside these areas could be conducted to identify what types of maintenance or upgrades are necessary. Following the inventory, a maintenance schedule could be developed to ensure that the system does not substantially degrade before reuse. (Army, the Marina County Water District, the Seaside County Sanitation District, or a new wastewater entity)

This is considered feasible mitigation for this impact. There are no adverse environmental impacts associated with this mitigation measure.

6.4.1.3 Reuse Impacts

- **Impact: Generation of Up to 5.0 Million Gallons per Day of Wastewater (a 108% Increase from the Existing 2.4 Million Gallons per Day of Wastewater Generation)**

Alternative 6R proposes reuses that could generate up to 4.8 mgd of wastewater. Fort Ord has purchased 3.3 mgd of wastewater treatment capacity at the MRWPCA regional treatment plant, so an additional purchase of approximately 1.5 mgd of treatment capacity would be needed to accommodate the land uses proposed in this alternative. The existing plant has the capability to provide for an increased average daily flow of 7 mgd, assuming no other users increase their allocation or average flows. The additional 1.5 mgd of flow represents a substantial increase in the demand for wastewater service. Refer to Table 6.4-1 (Volume IV, Section 6.0).

- **Mitigation: Expand the Regional Treatment Plant**

The MRWPCA could expand the regional treatment plant to accommodate the wastewater generated by the new uses. The feasibility of expansion is constrained by the necessity of receiving a permit to expand from the Monterey Bay Unified Air Pollution Control District and limited treatment plant site area. The permit can be issued only if the population that could be supported by the expansion of the treatment plant could be consistent with Association of Monterey Bay Area Governments (AMBAG) projections. Therefore, this mitigation may be infeasible without an adjustment in AMBAG's projections for the Fort Ord area. A conditional use permit from Monterey County could also be required to allow the plant to use this increased capacity. Full treatment plant buildout is limited to 37 mgd on the current site. A new treatment plant would have to be constructed. (Monterey Regional Water Pollution Control Agency)

This mitigation is considered feasible. The existing treatment plant can only physically expand by approximately 10 mgd. This expansion would be sufficient to treat the additional wastewater generated by this alternative as well as accommodate additional future demand in the area. The expansion of the treatment plant would contribute to various growth-inducing impacts for the Monterey region. OR

- **Mitigation: Replace Installation Treatment Plants**

The future use and reuse of the Ord Village, East Garrison, Main Garrison, and Fritzsche Army Airfield treatment plants is not feasible as a result of these facilities' current condition. Only the East Garrison plant is operational, but only at a very low capacity. Ord Village is now only a pump station and Fritzsche has been dismantled. Permits from the Central Coastal Regional Water Quality Control Board and Monterey Bay Unified Air Pollution Control District would likely be necessary to enable MRWPCA to replace

the plants. (Monterey Regional Water Pollution Control Agency, Central Valley Regional Water Quality Control Board, and Monterey Bay Unified Air Pollution Control District)

This mitigation measure is potentially unfeasible because of the extreme growth-inducing impacts that would be associated with new wastewater treatment plants. The MRWPCB would most likely not approve any new treatment facilities until population projections for the Monterey region warranted additional facilities. OR

▪ ***Mitigation: Build New Treatment Plants***

New treatment plants could be constructed to provide wastewater treatment service to the new uses. These plants would require permits from the Central Valley Regional Water Quality Control Board, Monterey Bay Unified Air Pollution Control District, and possibly the local jurisdiction in which they would be located. (Monterey Regional Water Pollution Control Agency, the Marina County Water District, the Seaside County Sanitation District, or a new wastewater entity)

This mitigation measure is potentially unfeasible because of the extreme growth-inducing impacts that would be associated with new wastewater treatment plants. The MRWPCB would most likely not approve any new treatment facilities until population projections for the Monterey region warranted additional facilities. AND

▪ ***Mitigation: Implement Wastewater-Reducing Measures***

Wastewater-reducing measures could lessen the amount of wastewater treatment capacity that would be necessary to serve the new uses. These measures could include the following (Monterey Bay Unified Air Pollution Control District, a new wastewater entity, or the existing county and city public works departments):

- Require new uses to employ dual water systems, which enable potable water to be used for drinking and other essentials, but also allow nonseptic water (gray water) to be reused for irrigation or other nonpotable uses. This eliminates the need to treat gray water at a central wastewater treatment plant.
- Require new uses to employ low-flow showerheads, toilets, and faucets.
- Require hot water pipes to be insulated to reduce the amount of water wasted (and the wastewater generated) from waiting for the hot water to travel from the heater to the user.

This is considered feasible mitigation for this impact. There are no adverse environmental impacts associated with this mitigation measure.

▪ ***Impact: Need to Upgrade and Expand the Wastewater Collection System***

The wastewater collection system remaining outside of the POM annex and reserve center will need major expansion and renovation to serve the uses proposed under Alternative 6R. The existing collection system may not meet state and local standards for design and materials. The volume of wastewater to be transported may also require expansion of the regional collection system that passes through Fort Ord to the MRWPCA regional treatment plant.

- **Mitigation: Prepare and Implement a Wastewater Master Plan**

The mitigation is described for the "Need for Expansion of the Wastewater Collection System" impact under "Disposal Impacts" above.

- **Mitigation: Implement Wastewater-Reducing Measures**

Wastewater-reducing measures could lessen the amount of wastewater treatment capacity that would be necessary to serve the new uses. These measures could include the following (Monterey Bay Unified Air Pollution Control District, a new wastewater entity, or the existing county and city public works departments):

- Require new uses to employ dual water systems, which enable potable water to be used for drinking and other essentials, but also allow nonseptic water (gray water) to be reused for irrigation or other nonpotable uses. This eliminates the need to treat gray water at a central wastewater treatment plant.
- Require new uses to employ low-flow showerheads, toilets, and faucets.
- Require hot water pipes to be insulated to reduce the amount of water wasted (and the wastewater generated) from waiting for the hot water to travel from the heater to the user.

- **Impact: Inadequate Access to Maintain Wastewater Collection Facilities**

Proposed reuse of portions of the installation could restrict access to wastewater pump stations, collection lines, and other facilities outside of the POM annex. These facilities are necessary to provide wastewater collection service to the POM annex, reserve center, and other land uses. Access is necessary to maintain these facilities.

Loss of access could have a substantial effect because without maintenance, wastewater facilities could degrade, resulting in violations of federal, state, or local standards related to wastewater disposal.

- **Mitigation: Provide for Public Utilities Easements**

Public utilities easements will be written into leases and use agreements to ensure that access to wastewater collection facilities would be maintained to provide service to the POM annex. (Army)

This is considered feasible mitigation for this impact. There are no adverse environmental impacts associated with this mitigation measure.

6.4.1.4 Cumulative Effects

Wastewater treatment capacity at the MRWPCA facility has been purchased by all jurisdictions in its service area, including 3.3 mgd by Fort Ord. This capacity has been allocated to absorb future growth as projected by AMBAG. The existing treatment plant has a permitted capacity of 27 mgd and average flow of 20 mgd, including 2.4 mgd from Fort Ord. Alternatives 1, 2, 3, 4, and 6R would create a demand for wastewater treatment plant capacity above the 3.3 mgd purchased by Fort Ord. When combined with future increases in other parts of the service area, these alternatives would exceed current plans for providing adequate wastewater service. This demand for capacity beyond current plans would have an adverse cumulative effect if other local entities plan for and allow growth to exceed current AMBAG projections.

A wastewater treatment master plan would be developed and implemented to serve projected growth in MRWPCA's service area. The plan would identify how additional plant capacity would be financed and phased to meet the demands of future development. The plan would identify how measures such as use of gray water systems and low-flow fixtures would be required in new development to reduce wastewater treatment demands. The plan would identify methods that would be used to dispose of wastewater in compliance with state and local guidelines. Reclaiming wastewater for irrigation would be considered in this plan. Approval of new development projects would be conditioned on the availability of wastewater treatment capacity consistent with the master plan.

6.4.1.5 Summary Comparison of Reuse Alternatives

Alternative 1, Subalternative C would have the greatest impact on the wastewater collection and treatment facilities on Fort Ord and in the vicinity. This alternative would require the need for up to 16.6 mgd of additional wastewater treatment capacity, a need for an additional 10.5 mgd of capacity. Alternative 2 would have the next greatest impact on wastewater collection and treatment facilities, generating the need for up to 9.8 mgd of additional wastewater treatment capacity, a need for an additional 5.9 mgd of capacity. Alternative 3 would have less impact than Alternatives 1 and 2 on wastewater collection and treatment facilities, generating the need for up to 5.6 mgd of additional wastewater treatment capacity and no need for capacity beyond that available at the regional treatment plant. Alternative 4 would have less impact than Alternative 3 on wastewater collection and treatment facilities, generating the need for up to 4.4 mgd of additional wastewater treatment capacity. Alternative 6R would require an additional treatment capacity of 1.7 mgd, the least required by the developed reuse alternatives. Alternative 5 would not generate a need for additional wastewater treatment allocation; the alternative would make allocation available for use in other areas.

6.4.2 Solid Waste

6.4.2.1 Introduction

Solid waste impacts were assessed based chiefly on information in the Fort Ord Task Force report on water, sewer, and solid waste (Fort Ord Task Force, Sewer and Solid Waste Committee 1992) and the Other Physical Attributes Baseline Study of Fort Ord, California (U.S. Army Corps of Engineers, Sacramento District 1992e). Other information was gathered from the Monterey Regional Waste Management District (Monterey Regional Waste Management District pers. comm.) and from the Monterey County Solid Waste Management Plan.

This analysis is based on the following assumptions:

- The Fort Ord area is served by the Monterey Regional Waste Management District (MRWMD), which provides landfill space.
- The solid waste generation rate (based on an approximate permanent base population of 31,270 and an existing base-wide solid waste generation rate of 94 tons per day [tpd]) is approximately 6 pounds per person per day (lb/cap/day). In 1988, the solid waste generation rate in the MRWMD service area was approximately 8.55 lb/cap/day. The target rate is 5.4 lb/cap/day if Monterey County is to meet the reductions in solid waste generation mandated by Assembly Bill 939. Therefore, this analysis assumes a target rate of 5.4 lb/cap/day and a maximum generation rate of 8.55 lb/cap/day. Table J-2 in Appendix J (Volume IV, Section 6.0) describes the methodology used to calculate solid waste that would be generated by the proposed land uses under each reuse alternative.

- To simplify the analysis for solid waste generation, each reuse alternative and subalternative was assumed to be at buildout.
- Landfill life calculations assume that waste-to-landfill rates continue at 1,000 tpd for 100 years to determine the baseline amount of solid waste that would be generated under future no project conditions (Table J-3, Appendix J. [Volume IV, Section 6.0]). This also assumes no growth over this period and no reduction in waste-to-landfill rates from the opening of a materials recovery facility (that would recover recyclable and compostable material from the waste stream) or from other waste reduction activities.

Even though MRWMD plans to reduce solid waste generation through a variety of activities and growth will continue over the life of the landfill, the above assumptions allow impacts of reuse to be compared to a baseline.

This analysis assumes the proposed action and Alternative 6R would have a substantial effect if it resulted in:

- generation of a substantial amount of additional solid waste or
- substantial decrease in landfill life.

6.4.2.2 Disposal Impacts

There would be no disposal impacts on solid waste.

6.4.2.3 Reuse Impacts

- *Impact: Generation of Up to 96 Tons per Day of Solid Waste (2% Increase from the Existing 94 Tons per Day)*

The land uses proposed under this alternative would generate a maximum of 96 tons per day (tpd) of solid waste, 2 tpd more than the existing generation rate. This volume of waste is a similar to present conditions; it would reduce the life of the Marina Landfill by approximately 1 year if all waste would continue to be disposed of at that site.

- *Mitigation: None Required*
- *Impact: Generation of Demolition Waste*

Buildings, roads, and other facilities could be demolished during disposal if they would not be compatible with reuses or could not be upgraded to meet state and local standards.

- *Mitigation: Recycle Demolition Waste*

During demolition, waste wood, metal, concrete, asphalt, and any other recyclable materials generated could be recycled. (Local agencies and private entities responsible for development)

This is considered feasible mitigation for this impact. However, it would be necessary to contract out to a solid waste disposal purveyor to accommodate this additional recyclable waste. There would be no adverse environmental impacts associated with this mitigation measure apart from any impacts as a result of the disposal or reuse of this waste.

6.4.2.4 Cumulative Effects

Because the Marina Landfill has a life of 100 years, assuming successful waste reduction and recycling measures, the cumulative effects of reuse would be similar to the direct impacts of reuse. Alternatives generating less than the existing 94 tpd of refuse generated at Fort Ord would not contribute to cumulative impacts. Alternatives generating more than that amount would contribute to cumulative effects. Mitigation would be similar to those identified for each reuse alternative.

6.4.2.5 Summary Comparison of Reuse Alternatives

Alternative 1, Subalternative C would have the greatest impact on the solid waste collection and disposal service in the Fort Ord vicinity. This alternative would generate up to 1,086 tpd of additional solid waste. Alternative 2, Subalternative A would have less impact than Alternative 2 on solid waste collection and disposal service, generating up to 433 tpd of additional solid waste. Alternative 3 would have the next greatest impact on solid waste collection and disposal service, generating up to 158 tpd of additional solid waste. Alternative 4 would have less impact than Alternative 3 on solid waste collection and disposal service, generating up to 38 tpd of additional solid waste. Alternative 6R would generate approximately 2 tons a day of solid waste beyond what Fort Ord currently generates, reducing the landfill life by only one year. Alternative 6R generates the least amount of additional solid waste of all the developed reuse alternatives. Alternative 5 would not generate additional solid waste.

6.4.3 Telephone Service

6.4.3.1 Introduction

For reuse alternatives, the acres of telephone service area needing upgraded utilities were estimated by subtracting the acres of proposed undeveloped land uses (no proposed use and open space) from the total acres at Fort Ord. The POM annex and reserve center already have telephone service. This was compared to existing land uses, which consist of 5,181 acres of developed land and 22,545 acres of undeveloped land.

The following assumptions were made for this analysis:

- impacts on telephone service are based on telephone service area, not on proposed land uses and
- the service area is based on proposed developed areas that may require telephone services.

6.4.3.2 Disposal Impacts

- *Impact: Potentially Inadequate Telephone Facilities to Provide Service to Interim Uses outside the Presidio of Monterey Annex*

Telephone facilities at Fort Ord could be potentially inadequate to serve interim uses such as the university, McKinney Act, and POM annex.

- *Mitigation: Upgrade or Replace Telephone Facilities Needed to Provide Service to Interim Uses*

Telephone facilities could be upgraded or replaced as needed to provide adequate telephone service for interim uses. A detailed engineering study should be prepared to assess the Army's existing telephone system's ability to provide service to interim uses. The system may prove to be adequate for proposed interim uses but may need some upgrades and maintenance to continue this service. (Pacific Bell, lessees)

This mitigation measure is feasible, however, the Army most likely will not upgrade the system, and Pacific Bell has stated that it would not take over the system until it was upgraded at no cost to them. The upgrade and/or replacement of the telephone system may have other adverse environmental impacts such as impacts related to replacing the system including disruptions in existing service and potential disturbance of biological resources.

- ***Mitigation: Replace or Upgrade Army Infrastructure***

The Army system is deficient because it is substandard, the modules used are obsolete (Fort Ord Community Task Force 1992), and some poles need to be replaced (Pacific Gas and Electric Company pers. comm.). This infrastructure, used by state agencies, local agencies, or private entities, could be replaced or upgraded to meet California Public Utilities Commission standards. (Pacific Bell, City of Seaside, City of Marina, and local agencies and private entities responsible for development)

This mitigation measure is feasible, however, the Army most likely will not upgrade the system, and Pacific Bell has stated that it would not take over the system until it was upgraded at no cost to them. The upgrade and/or replacement of the telephone system may have other adverse environmental impacts such as impacts related to replacing the system including disruptions in existing service and potential disturbance of biological resources.

- ***Mitigation: Expand Existing Pacific Bell Service into Areas With Existing Army Service***

Pacific Bell could expand its existing service area to provide upgraded service to those reuse areas that are currently provided Army service. This could be accomplished by gradually phasing out the Army's service in those areas that Pacific Bell expands. This would be the case with the university uses, the McKinney Act uses, the POM annex and various other uses that are currently in the Army's service area. Coordination between the reuses and Pacific Bell's expansion would enable the Army to gradually abandon its system as Pacific Bell expands and prevent any lapse of service.

This mitigation measure is considered feasible. Pacific Bell could expand their service area into the POM annex area. Since telephone is not a finite resource, this expansion is feasible if Pacific Bell is willing to do so. The expansion of Pacific Bell's system may have adverse environmental impacts such as impacts related to replacing the system including disruptions in existing service and potential disturbance of biological resources.

- ***Mitigation: Create a Special Utilities District***

To provide funding for construction, operation, and maintenance of the upgraded system, a special utilities district could be created that could include the proposed Army POM annex. (Pacific Bell and local agencies)

This is not a feasible mitigation measure because it would require cooperation from all entities in the Fort ord area. The City of Seaside has already stated that they would be against any such district. There may be impacts to franchise existing agreements in the area if a special utilities district was created.

- ***Mitigation: Continue Pacific Bell Service to Existing Service Areas***

The existing arrangement with Pacific Bell could ensure continued telephone maintenance and service to most of the existing residential areas that are proposed for reuse. (Pacific Bell)

This is considered a feasible mitigation measure and would not have any adverse environmental impacts associated with it, since all it would consist of is continuing an existing service.

6.4.3.3 Reuse Impacts

- ***Impact: Reduction of Approximately 240 Acres of Telephone Service Area***

Alternative 6R requires that telephone service be provided to approximately 4,950 acres of developed uses. This is a decrease of approximately 240 acres (95% of the existing service area) from existing conditions.

- **Mitigation: None Required**

- ***Impact: Lack of Utility Corridors or Restriction of Access to Existing Utility Corridors***

The lack of public utility easements may limit providers' ability to provide additional or upgraded telephone infrastructure.

- ***Mitigation: Establish Easement Rights and Maintenance Access for Utilities on Nonfederal Lands***

Public utility easements could provide corridors for telephone lines. This action could also establish specific guidelines for maintaining access to those corridors. (Pacific Bell, City of Seaside, City of Marina, and local agencies and private entities responsible for development)

This is a feasible mitigation measure for this impact and would have no adverse environmental impact associated with it.

- ***Impact: Disruption of Service Because of Construction***

Underground utilities could be affected during construction, disrupting service.

- ***Mitigation: Disclose Information on Buried Utilities to the Underground Service Alert***

The Army will provide copies of utility maps and as-built drawings to future utility managers and other information on buried utilities to the Underground Service Alert before construction of reuse alternatives. (Army and Pacific Bell)

This is a feasible mitigation measure for this impact and would have no adverse environmental impact associated with it.

- ***Impact: Restricted Access to Telephone Infrastructure from Lack of Clear Ownership of Infrastructure***

Ownership of the telephone infrastructure is unclear because the utility poles contain telephone, cable television, and electrical infrastructure. This infrastructure is currently owned by the Army, Pacific Bell, and Pacific Gas and Electric Company (PG&E). Because it is unclear which entity owns which lines, access could be delayed or restricted.

- ***Mitigation: Determine Ownership of Infrastructure***

The determination of the ownership of telephone infrastructure upon disposal could make access to the infrastructure less difficult because it would be known which entity owns which lines, thereby improving maintenance time and access. (Pacific Bell)

This is a feasible mitigation measure for this impact and would have no adverse environmental impact associated with it.

6.4.3.4 Cumulative Effects

The projected growth rate of the Monterey Peninsula area and the development of the Fort Ord installation would not result in any additional adverse cumulative effects on telephone resources because there is no limitation to the provision of this element of infrastructure.

6.4.3.5 Summary Comparison of Reuse Alternatives

Alternative 1 would result in the greatest need for additional areas of telephone service. Alternative 2 would result in the next greatest need, followed by Alternatives 3, and 4. Alternatives 5 and 6R would result in a decrease in the existing telephone service area. Alternative 5 would result in the greatest decrease.

6.4.4 Gas and Electric Service

6.4.4.1 Introduction

Estimates for gas and electric consumption for the various alternatives were developed in consultation with Pacific Gas and Electric Company (PG&E) (Pacific Gas and Electric Company pers. comm.) and were based on floor area ratios and energy use factors for different land uses (Table J-4, Appendix J [Volume IV, Section 6.0]). The consumption estimates should be used for planning purposes only and to compare alternatives. Additional energy use analyses will be necessary before reuse alternatives are implemented.

This analysis assumes the proposed action and Alternative 6R would have a substantial effect if it resulted in a substantial increase in energy consumption or energy waste.

6.4.4.2 Disposal Impacts

- *Impact: Potential Service Continuity Problems Resulting from the Army-Operated System*

Service problems are likely to arise if the Army and PG&E operate different systems. To ensure systems are compatible, the following mitigation is recommended:

- *Mitigation: Conduct Periodic Maintenance*

Maintenance and calibration of Army systems to PG&E standards will ensure greater continuity of service. A service and support agreement will allow for the periodic maintenance, repair, and service of Army systems. (Army and PG&E Company)

This is considered feasible mitigation for this impact. Maintaining Army facilities would assist the Army in providing these services to interim users. There would be no adverse environmental impacts associated with this mitigation measure.

6.4.4.3 Reuse Impacts

- *Impact: Demand for Approximately 740 Thousand Cubic Feet per Hour of Gas and Approximately 87 Megawatts of Electric Service (an Increase of Approximately 507% More Gas and Approximately 483% More Electric Service Demand)*

Implementation of Alternative 6R would result in a need for 507% more gas service and 483% more electric service (based on the existing consumption on Fort Ord of 146 thousand cubic feet per hour (MCFH) of gas and 17.6 Megawatts of electricity). PG&E Company is capable of serving all future demand requirements (Pacific Gas and Electric Company pers. comm.).

- **Mitigation: Require an Evaluation of Individual Metering Site Requirements, Operability, and Costs**

Before Army facilities are transferred, individual metering requirements, operability, and costs could be determined. A study could be required prior to reuse. (Pacific Gas and Electric Company, City of Seaside, City of Marina, City of Sand City, and other local agencies and private entities responsible for development)

This is considered feasible mitigation for this impact. There would be no adverse environmental impacts associated with this mitigation measure.

- **Mitigation: Impose a Utility Franchise Fee**

A utility franchise fee could be imposed to allow for the construction and development of infrastructure needed for projected development. (City of Seaside, City of Marina, City of Sand City, and local agencies)

This is considered feasible mitigation for this impact. However, the utility franchise fee would have to be assessed by local entities without PG&E's assistance. There would be no adverse environmental impacts associated with this mitigation measure.

- **Mitigation: Implement Best Design Practices to Reduce Potential Energy Consumption**

Best design practices could be implemented to reduce potential energy consumption. Best design practices could include solar water heating, double pane windows, orientation of buildings to maximize heating and cooling, use of landscaping to shade houses, and use of optimum insulation for attics, walls, and pipes. (Pacific Gas and Electric Company, City of Seaside, City of Marina, City of Sand City, and other local agencies and private entities responsible for development)

This is considered feasible mitigation for this impact. There would be no adverse environmental impacts associated with this mitigation measure.

- **Mitigation: Upgrade or Replace Infrastructure**

Utility relays at Fort Ord are dirty, improperly set, and need calibration. The existing electrical system has deficient metering and relay devices in Feeder No. 8, lacks tie circuits in Feeders No. 2 and No. 5, and experiences large load swings because of well pumps. The capacity of the PG&E transformer would also exceed capacity in fiscal year 1994 (Fort Ord Community Task Force 1992). Infrastructure used by state or local agencies or private entities should be replaced or upgraded to meet California Public Utilities Commission standards. (Pacific Gas and Electric Company, City of Seaside, City of Marina, City of Sand City, and other local agencies and private entities responsible for development)

This mitigation is not considered feasible mitigation for this impact. The reason it is not feasible is that this mitigation would require the Army to pay for these upgrades, which is possible, but would create a large financial burden to the Army. The upgrading or replacement of Army lines would help create an upgraded distribution system providing better service for the various reusers. Any adverse environmental impacts associated with this mitigation measure would be as a result of the expansion of new upgraded infrastructure and the dismantling of older infrastructure. These impacts may result in disturbed biological resources and potential disruptions in existing service.

- **Mitigation: Create a Special Utilities District to Serve the Presidio of Monterey Annex, Reserve Center, and Private Property**

The creation of a special utilities district could ensure the continuation of gas and electrical service to the POM annex and the reserve center. Individual metering could be required for private property, requiring additional infrastructure. (Pacific Gas and Electric Company and local agencies)

This is not a feasible mitigation measure because it would require cooperation from all entities in the Fort Ord area. The City of Seaside has already stated that they would be against any such district. There may be impacts to existing franchise agreements in the area if a special utilities district was created.

- **Impact: Lack of Utility Corridors or Restriction of Access to Existing Utility Corridors**

The lack of public utility easements may limit the ability to provide additional infrastructure.

- **Mitigation: Establish Easement Rights and Maintenance Access for Utilities on Nonfederal Lands**

Public utility easements could provide corridors for gas and electric utilities. This action would also establish specific guidelines for maintaining access to those corridors. (Pacific Gas and Electric Company, City of Marina, City of Seaside, City of Sand City, and other local agencies and private entities responsible for development)

This is considered feasible mitigation for this impact. There would be no adverse environmental impacts associated with this mitigation measure.

- **Impact: Disruption of Service Because of Construction**

Underground utilities could be affected during construction, disrupting service.

- **Mitigation: Disclose Information on Buried Utilities to the Underground Service Alert**

The Army will provide copies of utility maps and as-built drawings to future utility managers and other information on buried utilities to the Underground Service Alert before construction of reuse alternatives. (Army and PG&E Company)

This is considered feasible mitigation for this impact. There would be no adverse environmental impacts associated with this mitigation measure.

6.4.4.4 Cumulative Effects

The projected growth rate of the Monterey Peninsula area and the development of the Fort Ord installation would not result in any additional adverse cumulative effects on gas and electric resources because there is no limitation to the provision of this element of infrastructure.

6.4.4.5 Summary Comparison of Reuse Alternatives

Alternative 1 would result in the greatest need for gas and electric services. Alternative 2 would result in the next greatest need followed by Alternatives 3 and 4. Alternative 6R would require the least amount of additional gas and electrical service of all the alternatives except for Alternative 5. Alternative 5 would not require additional gas or electric service.

6.4.5 Cable Television

6.4.5.1 Introduction

The following assumptions have been made for this analysis: impacts on cable television service are based on service area, not on land uses and that the service area is based on developed areas that may require cable television services.

6.4.5.2 Disposal Impacts

- **Impact: Loss of Cable Service to the Presidio of Monterey Annex, Reserve Center, Main Garrison, and Barracks around the Silas B. Hays Army Community Hospital**

Service to the POM annex and reserve center could be lost during disposal as a result of Coastside Cable going out of business. Since Coastside Cable provides exclusive cable television to Fort Ord and the Presidio of Monterey, without substantial reuse after disposal, Coastside Cable would likely cease operations and service to the installation.

- **Mitigation: Maintain Cable Service**

Cable service will be maintained to the portions of the installation that will continue to be used during the disposal, interim, and initial reuse periods. A detailed engineering study should be prepared to assess what areas will continue to need cable television service and if those areas will receive adequate service based on the system's operating condition. A majority of the system's overplant is located on utility poles, many of which do not conform to GO 95 standards. The engineering study should provide information on the extent that these services can be provided in the disposal and interim periods. The Army should maintain this service by negotiating a contract to ensure cable television service to these identified facilities. (Army and Coastside Cable Company)

This is considered feasible mitigation for this impact. However, if Coastside Cable Company decides not to accept a reduced service area and goes out of business, the Army would be required to go out to bid for another cable television purveyor. There would be no adverse environmental impacts associated with this mitigation measure.

6.4.5.3 Reuse Impacts

- **Impact: Reduction of Approximately 1,660 Acres of Cable Television Service Area**

Alternative 6R requires that cable television service be provided to approximately 3,500 acres of developed uses. This is a decrease of approximately 1,660 acres (68% of the existing service area) from existing conditions.

- **Mitigation: None Required**

- **Impact: Deterioration of Cable Infrastructure in Areas Designated as No Proposed Use**

Alternative 6R proposes to reduce the service area for cable television by approximately 1,660 acres. This reduction in service area may result in the existing cable television infrastructure deteriorating from lack of use in the former developed areas where no reuse is now proposed and are vacant.

- **Mitigation: Reduce Cable Television Service to Proposed Reuse Areas Only**

Cable television service could be reduced to only the proposed reuse areas. The remaining infrastructure could be dismantled. (Coastside Cable Company and private entities responsible for development)

This is considered feasible mitigation for this impact. However, if Coastside Cable Company decides not to accept a reduced service area and goes out of business, the Army would be required to go out to bid for another cable television purveyor who would be willing to provide service to a limited area. There would be no adverse environmental impacts associated with this mitigation measure.

- **Impact: Lack of Utility Corridors or Restriction of Access to Existing Utility Corridors**

The lack of public utility easements may limit the ability to upgrade or dismantle infrastructure.

- **Mitigation: Establish Easement Rights and Maintenance Access for Utilities on Nonfederal Lands**

Public utility easements could provide corridors for cable lines. This action would also establish specific guidelines for maintaining access to those corridors. (Coastside Cable Corporation, Monterey Peninsula Television, and private entities responsible for development)

This is considered feasible mitigation for this impact. There would be no adverse environmental impacts associated with this mitigation measure.

6.4.5.4 Cumulative Effects

The projected growth rate of the Monterey Peninsula area and the development of the Fort Ord installation would not result in any additional adverse cumulative effects on cable television resources because there is no limitation to the provision of this infrastructure.

6.4.5.5 Summary Comparison of Reuse Alternatives

Alternative 1 would result in the greatest need for cable television services. Alternative 2 would result in the next greatest need followed by Alternatives 3, and 4. Alternatives 6R and 5 would both require a reduction in the cable television service to the installation, with Alternative 5 requiring the largest decrease in the service area.

6.4.6 Storm Drainage System

6.4.6.1 Introduction

The storm drainage system analysis was based on the following:

- the level of detail possible without site-specific designs or plans pertaining to proposed reuse drainage infrastructure and tie-ins to existing systems and
- short-term construction impacts and long-term urbanization impacts.

The storm drainage system analysis assumes the proposed action and proposed reuse alternative could have an adverse effect if it would result in substantially increased runoff peaks over existing conditions. Except for minor ponding which results where runoff is impeded by grates or culverts obstructed with leaves or debris, local and downstream drainage areas currently do not exhibit flooding problems. Extensive development or urbanization, however, could increase the flooding potential in the following areas:

- the Federal Emergency Management Agency 100-year floodplain or
- undersized culverts and storm drains.

6.4.6.2 Disposal Impacts

There would be no disposal impacts on the storm drainage system.

6.4.6.3 Reuse Impacts

- **Impact: Increased Site Runoff**

This alternative would convert approximately 10% of the undeveloped land from open space to urban-type uses which would alter site runoff peaks and durations. Urban development can diminish the infiltration capacity of the land due to increases in impervious surfaces which promote increased site runoff.

Although the existing storm drain system presently functions without major problems, the condition and capacities of much of the existing storm drain system is unknown. Because existing and various proposed development for the different reuse alternatives is within the 100-year floodplained and because of the many potentially undersized culverts and storm drains scattered throughout the Post, any increases in runoff to these systems may cause flooding problems.

- **Mitigation: Construct Onsite Drainage Facilities**

Local, on-site detention facilities which promote infiltration could be constructed to mitigate the increases in peak flow due to development. The facilities could consist of one or a combination of the following: vegetated drainage swales, gravel-lined drainage channels, french drains, and retention or detention basins. It should be noted that these systems, if constructed, should not be located in loading docks, process areas, storage areas, or areas vulnerable to chemical spills or contaminated runoff. Also, the placement of non-visually obtrusive fencing capable of restricting small children should reduce the risk of drowning around basins with standing water.

A storm drainage infrastructure system throughout the installation that safely conveys runoff from individual homes, lots, and streets to the drainage facilities via a system of culverts, gutters, and swales could be established. This local flood protection would be provided for at least the 10-year local flood event. The above measures should be adopted into local community plans to mitigate for increased stormwater flows from reuse development. (Local agencies and private entities responsible for development)

Implementation of this mitigation measure is considered feasible. Detention facilities have been constructed by the Army and are currently in use in the newer housing developments such as Abrams Park. Incorporating stormwater runoff control measures into development plans reduces the initial capital cost of construction. Annual operation and maintenance costs of structural controls generally range from 2% to 5% of capital cost.

- **Mitigation: Replace Undersized Culverts and Stormdrains**

Stormwater flows will increase as a result of development during reuse. The increase in flows will depend on the size of the drainage sub-basins and the amount of development allocated to each sub-basin. The net result of these peak flows increases the potential for culverts to back up and storm drains to overflow, both of which may flood nearby areas. Replacing undersized culverts and storm drains before development occurs would ensure local and downstream flooding will not occur. (Local agencies and private entities responsible for development)

Implementation of this mitigation measure is considered feasible. Cost can vary substantially depending on the length of pipe needing replacement. These costs can be funded by assessing a development fee, which should be based on the property use, location, and size.

- **Impact: Increase in Erosion Potential due to Detention Basin Construction or Culvert and Storm Drain Replacement**

Construction of detention basins or the replacement of culverts and storm drains could result in increased erosion and sedimentation downstream from exposed soils. This impact could fill existing

detention facilities, obstruct storm drain infrastructure, and/or adversely impact fisheries in the Monterey Bay National Marine Sanctuary or the Salinas River.

- ***Mitigation: Implement Construction Best Management Practices***

Best Management Practices (BMPs) that could be implemented for the construction site include the following:

- dike and berm controls,
- ditch and swale controls,
- sediment collection,
- land grading controls,
- vegetation and mulching,
- structure slope stabilization, and
- and litter/solid waste management.

In addition, construction of these facilities should occur during prolonged dry periods to reduce the risk of erosion from exposed soils. (Local agencies and private entities responsible for development)

Implementation of this mitigation measure is considered feasible. Structural and nonstructural best management practices costs can vary substantially depending on size and location. Generally, these costs can be reduced by planning for BMPs in advance. Many local ordinances currently require a some form of this mitigation measure.

- ***Impact: Division of Storm Drain System Management***

The Army has been maintaining and upgrading the storm drain system throughout the installation as needed. This has included periodic clearing of sediment and debris and replacement of storm drains and culverts to prevent local and downstream flooding. During reuse, these activities would be fragmented between multiple jurisdictions (the Army and local communities) over the same length of pipe or ditch, which could result in obscured and sub-standard maintenance responsibility and an increased potential for local and downstream flooding.

- ***Mitigation: Create Joint Powers Agreement to Ensure Proper Oversight and Maintenance***

Storm drains that extend beyond a community's jurisdiction is not unusual. Responsibility for storm drain operations and maintenance is often divided. A Joint Powers Agreement (JPA) could be formulated to ensure proper operation and maintenance of the storm drain system during reuse. (Army, local agencies, and/or special utilities district)

Implementation of this mitigation measure is considered feasible for this impact. The final disposition of the storm drainage system will determine the different jurisdictions involved in the JPA.

6.4.6.4 Cumulative Effects

Alternatives 1, 2, 3, 4, and 6R would all cause additional surface runoff that may contribute to future cumulative watershed flooding problems, particularly to existing areas within the Federal Emergency Management Agency 100-year floodplains. Alternative 5 would not contribute significant amounts of surface runoff to the area since this alternative maintains conditions similar to existing conditions, and, thus, would not have a cumulative effect on the watershed.

6.4.6.5 Summary Comparison of Alternatives

Alternatives 1 and 2 would require the greatest additional storm drain system. Alternatives 3, 4, and 6R would require less of a storm drainage system than Alternatives 1 and 2, but more than is currently available. Alternative 5 would not require a substantial upgrade or improvement of the system.

6.4.7 Water Distribution Infrastructure

6.4.7.1 Introduction

The water distribution infrastructure area that would need upgrading was estimated by subtracting the acres of proposed undeveloped land uses (no proposed use, open space, the POM annex, and reserve center) from the total acres at Fort Ord, and then comparing the result to the existing land uses. This analysis is based on the following:

- Impacts on water distribution infrastructure are based on service area, not on land uses.
- The service area is based on developed areas that may require water distribution infrastructure.
- Some water distribution infrastructure may exist outside of the POM annex that has not been used in sometime but could be utilized upon reuse.

6.4.6.2 Disposal Impacts

There would be no disposal impacts on the water distribution infrastructure.

6.4.7.3. Reuse Impacts

- *Impact: Need for Additional Water Distribution Infrastructure Outside of the Presidio of Monterey Annex for Up to Approximately 2,500 acres (an approximate 50% increase of the Existing Service Area).*

Water distribution infrastructure exists only in the western, developed portion of the installation. Up to approximately 2,500 acres could need upgrading and/or service under this alternative.

- *Mitigation: Upgrade and Replace Existing Water Distribution Infrastructure*

The existing water distribution system is operational, but is in substandard condition due to an unknown number of leaks and low water pressure. The infrastructure would have to be upgraded and replaced as needed to provide proper service. (City of Marina, City of Seaside, Sand City, California American Water Company, Monterey County Water Resources Agency, and Monterey Peninsula Water Management District)

Implementation of this mitigation measure is considered feasible for this impact. Reuse of Fort Ord will require a water supply system in place, and abandoning the water system and starting with a new system is unreasonable and would hinder reuse. The extent of needed upgrades and the costs associated with upgrades is unknown and is the subject of a detailed engineering analysis, but it can be safely assumed that abandoning the current system and starting over would cost substantially more than this mitigation measure. Development of a new water supply system would also result in secondary environmental and growth-inducing impacts (refer to Section 6.5, "Water Resources").

- **Mitigation: Create a Special Utilities District**

A special utilities district could be created through Monterey County to provide funding for construction, operation, and maintenance of the upgraded and/or new system. (Monterey County Local Agency Formation Commission, Monterey County Water Resources Agency, Monterey Peninsula Water Management District)

Implementation of this mitigation measure is considered feasible for this impact because it would keep operation and maintenance of the interconnected system intact and within one utility jurisdiction. However, a special utilities district to provide for water service for an area such as Fort Ord would require a vote of affected property owners.

- **Impact: Deterioration of Water Distribution Infrastructure**

Existing infrastructure could deteriorate in unused portions of the water distribution system in the non proposed use areas. This deterioration may result in violating health and safety standards.

- **Mitigation: Maintain Water Distribution System Needed for Reuse and Abandon Unused Portion**

Water distribution infrastructure could be reduced to only the proposed reuse areas. The remaining water distribution infrastructure could be dismantled. (Local water companies)

Implementation of this mitigation measure is considered feasible, however it is dependant on reuse requirements. Until long-term reuse is decided, it may not be reasonable to abandon portions of the system. There would be no adverse environmental impacts associated with this mitigation measure.

- **Impact: Disruption of Service Because of Construction**

Water distribution infrastructure could be affected during construction, causing disruption of service.

- **Mitigation: Disclose Information on Buried Water Distribution Infrastructure to the Underground Service Alert**

Information on the buried water distribution infrastructure will be provided by the Army before reuse development. (Army)

6.4.7.4 Cumulative Effects

Because water distribution systems are not finite resources, the projected growth rate of the Monterey Peninsula area and the development of the Fort Ord installation would not result in any additional cumulative impacts on water distribution infrastructure. The only concern would be the amount of water supply that exists. If adequate water supply is not available for the projected growth of the Monterey area, then water distribution infrastructure would not be needed. Depending on the status of the water supply, the water distribution infrastructure would be built to distribute any amount of water necessary to service the area.

6.4.7.5 Summary Comparison of Reuse Alternatives

Alternatives 1 and 2 propose the most development, requiring the most water and the greatest extent of new and upgraded water distribution system. Alternatives 3, 4, and 6R would require less water therefore less water infrastructure than Alternatives 1 and 2, but more than what is currently available. Alternative 5 would require only enough water to maintain open space and recreation areas, and the POM annex. The existing system could be adequate to provide water distribution to the uses proposed under this alternative.

6.5 WATER RESOURCES

6.5.1 Hydrology and Water Quality

6.5.1.1 Introduction

A combined analysis of issues related to hydrology and water quality was based on the following:

- existing information on surface water, groundwater, and water quality provided by the Army,
- the level of detail possible without site-specific designs or plans pertaining to proposed reuse drainage infrastructure and tie-ins to existing systems, and
- short-term construction impacts and long-term urbanization impacts.

There would be no disposal impacts to hydrology for any of the reuse alternatives or subalternatives. All impacts would be related to reuse. Effects of disposal on water quality would be beneficial because less urbanized activity would take place on the installation and hence less urban water quality pollutants would be generated. This analysis assumes the proposed action and Alternative 6R would have a substantial effect if it would result in:

- substantial degradation of water quality such that it would not meet water quality criteria or objectives identified in the basin plans of the Central Coast Regional Water Quality Control Board's Water Quality Control Plan;
- any substantial alteration of surface waters on the installation and in Monterey Bay, including temperature, dissolved oxygen, or turbidity, that would cause conflicts with standards as identified in federal or state law; or
- disturbance of existing channel banks and channel beds to the extent that erosion and siltation could occur upstream or downstream.

6.5.1.2 Disposal Impacts

There would be no disposal impacts on hydrology and water quality.

6.5.1.3 Reuse Impacts

- *Impact: Increases in Site Runoff*

This alternative would convert land from open space to urban and other development, which would alter site runoff peaks and durations. Urban development could diminish the infiltration capacity of the land due to the increases in impervious surfaces. Increased local runoff could increase the frequency and magnitude of flooding in local waterways.

Surface runoff within Fort Ord is conveyed by drainage systems consisting of natural channels and constructed storm drain systems. The existing storm drain system designed for the urban areas of Fort Ord was built in the 1940s as a separate system from the sanitary sewer lines. Although the existing storm drain system presently functions without major problems, the condition and capacities of much of the existing storm drain system is not known. Any increases in runoff to these systems may cause flooding problems.

Reuse of parcels throughout the installation would result in increases in impervious surfaces and would require new and retrofitted storm drain systems. Increasing impervious surfaces and adding storm drain and gutter systems alter existing runoff characteristics by providing a more efficient conveyance system of runoff. More efficient runoff conveyance systems decrease the natural storage capability of the watershed and alter the timing and magnitude of flood peaks entering offsite drainage systems downstream.

The Federal Emergency Management Agency (FEMA) flood insurance rate maps for Fort Ord indicate that some areas within the installation are within the Salinas River and Pilarcitos Canyon, El Toro Creek, and Canyon Del Rey 100-year floodplains.

Any increase in runoff peaks entering into the existing storm drainage infrastructure and drainage channels, particularly Pilarcitos Canyon, El Toro Creek, and Canyon Del Rey is a major concern because it may pose an additional flood threat to people and property in areas with existing flood problems.

- ***Mitigation: Construct Onsite Drainage Facilities***

Onsite detention and drainage facilities could be constructed to reduce surface runoff to existing conditions and promote infiltration. The facilities could consist of one, or a combination, of the following: vegetated drainage swales, gravel-lined drainage channels, french drains, and retention or detention basins.

A storm drain infrastructure system could be established that safely conveys runoff from individual homes, lots, and streets to the drainage facilities via a system of culverts, gutters, and swales. This local flood protection could be provided for at least the 10-year local flood event. (Local agencies and private entities responsible for development)

Constructing onsite drainage facilities is considered feasible mitigation for this impact and is typically included in any urban development. A comprehensive drainage system may, however, be costly if existing infrastructure cannot be used or must be upgraded.

Drainage facilities could affect areas otherwise considered not affected by this reuse alternative. For example, a storm pipe or channel system may need to be constructed from a university area through a no proposed use area to safely convey runoff. The no proposed use areas are generally not considered to be affected by reuse.

- ***Impact: Risk of Flood Damage from Development in the 100-Year Floodplain***

A review of the FEMA maps indicates some areas within the installation are within the 100-year floodplain. Some structural development may be proposed within the 100-year floodplain for this alternative. Any reuse development within these floodplains constitutes a risk to people and property from flood damage.

- ***Mitigation: Increase Drainage Capacities or Exclude Specific Development from the 100-Year Floodplains***

The capacity of existing drainages could be increased within the 100-year floodplain to accommodate anticipated 100-year floodflows, thereby removing areas from the floodplain, or particular reuse of these areas that are subject to flood damage could be excluded from development. (Local agencies and private entities responsible for development)

This mitigation is considered feasible for this impact because only a few small areas are within the 100-year floodplain within the installation.

- ***Impact: Water Quality Degradation from Urban Runoff***

This alternative would cause an increase in urban runoff and associated urban runoff pollutants. Runoff from urban areas can carry a variety of accumulated pollutants such as oil, grease, heavy metals (lead, cadmium, copper), sediment, pesticide residues, fertilizers, and coliform bacteria from roadways, parking lots, rooftops, and other surfaces. The highest concentrations of these pollutants are typically found during fall when pollutants accumulated during the dry period are washed away by the first storms of the season. Increases in urban runoff would degrade downstream aquatic habitat and resources in surface waterways (Salinas River, El Toro Creek, Arroyo Del Rey) and in Monterey Bay, a designated marine sanctuary.

Results of water quality monitoring by the California State Water Resources Control Board (SWRCB) through its State Mussel Watch Program indicate that resident mussels from parts of Monterey Bay contain high levels of lead, pesticides, and petroleum hydrocarbon concentrations (National Oceanic and Atmospheric Administration 1990).

- ***Mitigation: Construct Onsite Drainage Facilities and Obtain Necessary Stormwater Discharge Permits***

Constructing onsite drainage facilities is one means of controlling flooding and erosion but can also serve to capture and filter out urban pollutants. Onsite retention or detention facilities (such as grass swales, infiltration trenches, vegetated buffer strips, and silt and grease traps) could be constructed in the storm drain system for the proposed urban drainage infrastructure. These measures would result in the settling and accumulation over time of sediment and pollutants in the basin. Most pollutants associated with urban runoff from residential and light commercial development, such as lead and copper, would tend to accumulate in the deposited sediment. The types and amounts of pollutants present will depend on the amount and frequency of runoff and the management of the developed areas. Other pollutants could be removed by skimming or biodegradation. These increases, if properly designed, would largely prevent urban runoff from degrading water quality in surface waterways and Monterey Bay. (Local agencies and private entities responsible for development)

Constructing onsite drainage facilities for water quality control is considered feasible mitigation for this impact but may require the use of more land than for facilities designed only for runoff conveyance.

Permits have not been required in the past to discharge runoff within the installation. However, Section 6217 of the Federal Coastal Zone Management Act Reauthorization Amendments of 1990 requires local entities that discharge any stormwaters into the ocean to participate in the future in a non-point-pollution control plan developed by the California Coastal Commission and the SWRCB.

The SWRCB also adopted a General Industrial Storm Water Permit in November 1991, which will require that all storm drain outfalls classified as Industrial apply for a permit for discharge. This permit applies to stormwater discharges into open areas, streams, or the ocean. As part of permit issuance, the applicant must demonstrate BMPs to control water quality degradation. These BMPs may include retention or detention facilities, grass swales, buffer strips, and silt and grease traps and are considered feasible mitigation for this impact as described above for the previous mitigation measure.

On September 21, 1992, Monterey Bay was officially designated a national marine sanctuary. Under this designation, resource protection is assigned the highest priority among research and education programs and visitor use. The Marine Protection, Research, and Sanctuaries Act of 1972, as amended, and its implementing regulations (15 CFR 922) requires a management plan to protect the sanctuary's resources. Regulations established for this purpose have adopted BMPs to control non-point-source runoff; they do not,

however, alter or change existing SWRCB non-point-source runoff regulations discussed above. However, the Marine and Estuarine Management Division of the National Oceanic and Atmospheric Administration (NOAA) reserves the right to regulate any substance that enters the sanctuary from outside sources and injures sanctuary resources.

Implementation of BMPs associated with NOAA requirements are feasible mitigation for this impact but may require additional land for BMPs otherwise not required by the SWRCB and the California Coastal Commission.

- ***Impact: Water Quality Degradation from Increased Erosion during Construction***

The proposed development would require extensive construction and grading throughout the watersheds and possible disturbance of existing drainage channels. Construction and grading activities could temporarily cause significant increases in site erosion associated with storm runoff. Sediment-laden runoff entering nearby drainages causes increased channel siltation and reduced flood-carrying capacity downstream. Increased erosion may degrade downstream aquatic habitat in the streams and in Monterey Bay.

- ***Mitigation: Limit Water Erosion by Implementing Erosion-Control Structures***

New construction in highly erosive areas would require minimal surface disturbance; carefully designed paving of road surfaces, construction of paved drainage ditches, and conveyance of runoff to nonsloped areas; and prompt revegetation of disturbed areas. Existing erosion that threatens reuse should be mitigated and headcut repair techniques, including runoff diversion, shaping, rock riprap, and revegetation; gully downcutting should be mitigated with check dams, drop inlets, and revegetation. Implementing these erosion-control measures is considered feasible mitigation for this impact, but potentially costly. Erosion in some areas is so severe that erosion-control structures may not completely mitigate the impact. (Local agencies and private entities responsible for development with assistance from the U.S. Soil Conservation Service)

- ***Impact: Degradation of Water Quality from Hazardous Material Spills during Construction***

Because project construction would require the use of gasoline and diesel-powered heavy equipment, hazardous materials could spill onsite and wash into nearby drainages. Bulldozers, backhoes, water pumps, air compressors, and construction materials would be onsite. Chemicals such as gasoline, diesel fuel, lubricating oil, hydraulic oil, lubricating grease, automatic transmission fluid, paints, solvents, glues, and other substances will be onsite during grading and construction activities. An accidental spill of any of these substances could degrade the water quality of surface water in the drainage systems on and off the planning area. Hazardous spills entering adjacent waterways and groundwater may lead to degradation of downstream aquatic habitat and other beneficial uses.

- ***Mitigation: Prepare and Implement a Hazardous Substance Control Plan for All Construction Activities***

A hazardous substance control plan could be prepared and implemented for construction activities to reduce potentially significant impacts on water quality caused by a chemical spill. This plan could require safe collection and disposal of hazardous substances generated during construction activities and would include an emergency response plan to ensure quick and safe cleanup of accidental spills. (Local agencies and private entities responsible for development)

Implementation of a hazardous substance control plan is considered feasible mitigation for this impact, consisting primarily of training personnel in collection, disposal, and cleanup techniques and procedures.

6.5.1.4 Cumulative Effects

Alternatives 1 through 4, and 6R would cause additional surface runoff that may contribute to future cumulative watershed flooding problems, particularly to existing areas within the FEMA 100-year floodplains. Open space would not contribute significant amounts of surface runoff to the area because this alternative maintains conditions similar to those under existing conditions. Alternative 5 would not result in a cumulative effect on the watershed.

Alternatives 1 through 4, and 6R would all contribute to future water quality degradation within the watershed. These alternatives would result in increases in urban runoff and associated urban pollutants. Alternative 5 would not contribute significant additional amounts of surface runoff to the area and thus not contribute to water quality degradation.

6.5.1.5 Summary Comparison of Reuse Alternatives

Alternatives 1 through 4, and 6R would all have similar hydrologic and water quality impacts within the installation and adjacent areas. Alternative 1 would have more impacts than Alternative 2; Alternative 2 would have more impacts than Alternative 3; and Alternatives 3, and 4 would have fewer impacts than Alternatives 1 and 2 because of the relative differences of proposed reuse urbanization. Alternative 5 would have the least impacts because of the extensive acreage designated for open space and parks and recreation.

6.5.2 Water Supply and Demand

6.5.2.1 Introduction

Water demand for Alternative 6R was estimated using the same methodology used to evaluate Alternatives 1 through 5 for the draft EIS. Water demand factors were developed for new land use categories, such as McKinney Act housing and the university science office park. Water demand factors for several existing categories were revised because the category description under Alternative 6R was different than under the earlier alternatives. Categories with revised water demand factors include the POM Annex, university, and agri-center. Assumptions and calculations used to develop the new water demand factors and an itemization of water demand for Alternative 6R are presented in Appendix K (Volume IV, Section 6.0).

6.5.2.2 Disposal Impacts

There would be no disposal impacts on water supply and demand.

6.5.2.3 Reuse Impacts

- *Impact: Increased Demand for Water (Approximately 12,000 Acre-Feet per Year)*

Total water demand is estimated to equal approximately 12,000 acre-feet per year. There would be an additional increase in water demand outside Fort Ord but within the Salinas-Monterey area for students, employees and their families living off-campus. This additional demand would be approximately 2,700 af/yr, for a total regional water demand of 14,700 af/yr associated with Alternative 6R. This is two to three times greater than existing water use, which already exceeds safe yield of the groundwater system in the vicinity of Fort Ord. If the increase were supplied by local wells, seawater intrusion would be accelerated. Groundwater recharge from irrigation return flow, leaky water and sewer pipes, and infiltration of runoff from impervious surfaces would increase somewhat under this alternative. However, this increase would only partially offset the increase in pumpage.

- ***Mitigation: Increase Water Supply or Decrease Total Water Demand to Achieve a Balance***

New water supplies could be developed or water demand could be decreased for this alternative. Water demand would not be allowed to exceed the available supply at any stage of development.

Water supply could be increased by planning and constructing one or more new water supply projects. Projects that have already received some degree of study and support include the Salinas Valley Water Transfer Project, desalination, offstream storage of Salinas River water on Fort Ord, and a reservoir on the Arroyo Seco. These projects are briefly described below. Other projects that have been considered recently and dismissed at this time as being too unreliable, expensive, or difficult to implement include the San Felipe Project, the coastal aqueduct of the State Water Project, and raising the spillway at Lake Nacimiento (U.S. Army Corps of Engineers 1986, Jones & Stokes Associates 1990). Also, the New Los Padres Reservoir being developed by the Monterey Peninsula Water Management District will supply only enough water to meet buildout demand for Monterey Peninsula Water Management District's existing customers and is not a potential source of new supplies for Fort Ord.

The Salinas Valley Water Transfer Project being developed by the Monterey County Water Resources Agency would include a series of wells along the Salinas River in the vicinity of the Arroyo Seco cone, about 25 miles upstream of Fort Ord. Groundwater recharge capacity is relatively high in this area, so additional pumpage can easily induce additional recharge from the Salinas River. Water from the wells would be conveyed to the Marina-Fort Ord area via a pipeline. The annual amount of water to be delivered to Fort Ord by this project has not been finally determined.

Desalination of brackish water from wells near the Main Garrison could provide fresh water at a cost of about \$800 per acre-foot (U.S. Army Corps of Engineers 1986). If brackish water were pumped at the rate necessary to meet the demand for this alternative, salinity would increase because seawater intrusion would increase. The cost of desalinating seawater at a plant recently constructed in Santa Barbara is about \$1,900 per acre-foot. Although this supply is expensive, it is essentially unlimited.

Two reservoir sites on Fort Ord, one about half way between the East Garrison and the Main Garrison and one in Barloy Canyon, could be used to capture excess flows in the Salinas River or additional releases from San Antonio and Nacimiento Reservoirs. The recommended size of each reservoir is about 2,000 acre-feet. With this storage capacity, excess flows could provide a firm yield of about 1,000 acre-feet per year in 95% of the years at a cost of about \$850 per acre-foot. Reoperation of San Antonio and Nacimiento Reservoirs could supply about 17,000 acre-feet per year in 93% of the years at a cost of about \$500 per acre-foot (U.S. Army Corps of Engineers 1975, 1986). This yield could compete with the Salinas Valley Water Transfer Project yield, however.

A dam on the Arroyo Seco has been studied for many years and is still under active consideration (Jones & Stokes Associates 1990, U.S. Army Corps of Engineers 1986). The Arroyo Seco is a large tributary that enters the Salinas Valley about 35 miles inland from Monterey Bay. A 100,000 acre-foot reservoir near Greenfield could generate a firm yield of about 30,400 acre-feet per year at a cost of about \$900 per acre-foot. Conveyance to the Fort Ord area would be either by pipeline or by redirection from the Salinas River near Blanco Road.

Development of the above new supplies would create secondary environmental impacts that could be significant and would need to be evaluated in separate, project-specific environmental impact reports to comply with the California Environmental Quality Act. For example, desalination would require additional power generation and would create a concentrated brine requiring disposal. The Salinas Valley Water Transfer Project might decrease groundwater levels in summer near the extraction wells along the Salinas River and slightly decrease flow in the river. Construction of local reservoirs on Fort Ord would inun-

date existing natural habitat areas, and energy would be required to pump water from the Salinas River to fill the reservoirs. A dam on the Arroyo Seco would inundate existing riparian habitat and grazing land. Finally, all of the supply options would result in temporary environmental impacts associated with construction activities. These would probably be greatest for the Arroyo Seco dam project and smallest for desalination.

Developing new water supplies is feasible but costly. In addition, developing a new water supply is a long-term solution, not a short-term solution.

Water demand for this reuse alternative could be decreased by decreasing the amount of development or the consumptive use of water associated with individual land uses. Because most of the developed land uses will involve new construction, aggressive water conservation and reuse measures could easily be included in project design. These measures would go beyond those required by existing state and local laws or programs, such as 1.6-gallon toilets (required since 1987 by Monterey Peninsula Water Management District and since January 1, 1992 statewide) and the Water Conservation in Landscaping Act of 1990 (effective January 1, 1993). All of the following conservation measures would allow more development for the same amount of water, although they probably would not be sufficient to bring total demand for this alternative to within the safe yield of existing supplies. For example, an overall decrease in water demand of 50% would be a remarkable conservation achievement, but the remaining demand would still slightly exceed the safe yield of existing local groundwater supplies. A decrease in the total amount of development or an increase in supply would also be necessary. (Monterey County Water Resources Agency, Monterey Peninsula Water Management District, local agencies, and the U.S. Bureau of Reclamation):

- Use of reclaimed water to flush toilets and urinals in several large office buildings in Irvine, which decreased use of potable water by 60% to 70% (Water Conservation News 1991a).
- Ultra-low-flow plumbing fixtures and rainfall cisterns, and use of graywater for landscape irrigation, which decreased the use of municipal water in a single-family home in Tucson, Arizona, by 56%, to 49 gallons per capita per day. Graywater use is gaining wider acceptance among California agencies.
- Drip-irrigated drought-tolerant landscaping in the Monterey area, which has been found to decrease water use for irrigation by 75% relative to turf.
- Landscaping in public areas, including parks, schools, golf courses, and median strips, which has been successfully irrigated with reclaimed water since 1972 in Thousand Oaks, California. A storage tank for reclaimed water was constructed near the golf course, but it has never been connected to a supply of reclaimed water.
- Stormwater runoff could be directed to local ponds and allowed to infiltrate and recharge the groundwater system. Alternatively, rainfall could be collected in on-site cisterns and stored for irrigation purposes during the summer. For example, runoff from the roof of a single-family home (2,000 square feet) in Fort Ord, where average annual rainfall is about 14 inches, could supply the entire annual irrigation demand for a 900-square-foot lawn. However, a large (15,000-gallon) cistern would be required to store this water from the winter rainy season to the summer irrigation season.
- Existing buildings could be retrofitted with water meters and ultra-low-flow plumbing fixtures. These measures have been found to achieve a 12-20% decrease in overall water use in residences and a 20-45% decrease in many types of businesses (Interface 1989, Porter 1991, Water Conservation News 1991b).

- Aggressive water conservation measures at 15 industrial facilities near San Jose resulted in a total water savings of 1,600 acre-feet per year. The firms represented a mix of electronics manufacturing, metal finishing, paper reprocessing, and food processing, which might be typical businesses for the Fort Ord area. Water use rates for processes to which conservation measures were applied were reduced by an average of 52%, and investment payback periods ranged from 0.2 to 3 years. Water use patterns and conservation opportunities can be highly variable among different industries and individual facilities. Many of the largest savings resulted from recycling or reusing water for cooling and rinsing processes (City of San Jose et al. 1990). Similar savings have resulted from commercial and industrial water conservation efforts in other areas.

Decreasing water demand is considered infeasible because it would require reconfiguration of this alternative or major conscience-raising efforts by future users to significantly limit the amount of water that can be used.

• *Impact: Changes in Groundwater Recharge*

Urbanization of Fort Ord would tend to increase groundwater recharge from leaky pipes and irrigation return flow in landscaped areas. The increase in impervious area would tend to decrease direct rainfall recharge, but much of the rain that falls on impervious areas would still become recharge if it runs off to adjacent pervious areas or is routed to stormwater detention ponds that allow it to percolate into the ground.

Increased recharge from urbanization would not be able to directly reach the 180-foot aquifer in areas underlain by the Salinas Valley aquiclude (refer to Figure 4.5-1 in Volume I). However, the aquiclude is discontinuous along the coast and in the vicinity of the East Garrison, and recharge would eventually flow to the 180-foot aquifer in those areas. Increased recharge near the coast would elevate the existing low water level mound and thereby tend to repel seawater intrusion near the Main Garrison. Increased recharge near the East Garrison would increase the availability of water to existing potable supply wells in that area.

Under this alternative, urbanization would occur in areas overlying both the Salinas Valley and Seaside groundwater basins. The increase in recharge would increase the local safe yield of the groundwater basins. The amount of increase cannot be estimated accurately until details regarding development density, landscaping, stormwater disposal, and water conservation measures are known.

In general, urbanization will increase local groundwater recharge, which would be beneficial. The increase in recharge will be less than the increase in water demand resulting from urbanization, however. Thus, there will still be a net increase in water demand.

Groundwater recharge from urban areas could contain contaminants that would deteriorate existing water quality. Some of the urban development proposed under this alternative would be new construction. Existing regulations that would apply to new construction would prevent a significant risk of contamination from point sources, such as underground storage tanks and handling or transfer areas for hazardous materials. The non-point-source contaminant most likely to significantly impair groundwater quality is nitrate from leaky sewer pipes and fertilization of landscaped areas. This is a secondary impact that should be addressed during separate environmental review of individual development projects as they are proposed.

• *Mitigation: None Required*

6.5.4 Cumulative Effects

In addition to the water demand created by students and university employees living on campus, Alternative 6R would create a water demand generated by students and employees (and their families) who live off campus but in the Salinas-Monterey area. This water demand will have as much overall impact on the regional water supply situation as if the families lived on Fort Ord. The University of California, Santa Cruz (UCSC) expects to employ "several thousand" people at its research facilities. California State University (CSU) Monterey Bay expects a "buildout" population of 25,000 students, of which only 16,000 were accounted for in the above on-campus water demand calculations. The CSU also expects to employ "at least 3,000" people, of which 500 were assumed to live on campus and were included in the water demand itemized above.

The water demand for the 9,000 students and 5,500 employees living off campus includes the residential water demand plus secondary water demand for commercial, institutional, and recreational services for those people. The combined types of water demand can be estimated using an overall per capita water demand of 120 gallons per person per day, which assumes water-conserving lifestyles. Assuming that students are single and immigrate from outside the Salinas-Monterey area, and that each university job results in two immigrants to the area, the university-related uses on Fort Ord would bring about 20,000 new residents to the communities surrounding Fort Ord. These new residents would increase local water demand by about 2,700 af/yr and would bring the total university-related water demand to about 4,200 af/yr for CSU, Monterey Bay and about 1,800 af/yr for the UCSC university science offices (assuming full development of the 477 acres allotted to science offices).

Overall, increased water demand on Fort Ord would add to the urgency of developing new water supplies for the Monterey Peninsula and coastal Salinas Valley areas. Water demand at buildout in areas served by Monterey Peninsula Water Management District (including Seaside) is expected to be about 4,600 acre-feet per year (25%) greater than water use in 1988. The City of Marina will require new supplies because water levels below sea level in the 900-foot aquifer will eventually cause seawater intrusion into the municipal wells. Most of the remaining land in the pressure area of the Salinas Valley is already either irrigated or urbanized.

Pumpage by groundwater users in the pressure area other than Marina and Fort Ord was about 150,000 acre-feet per year in the mid-1980s. Even a small percentage increase in water use by these users could add substantially to impacts associated with increased pumpage on Fort Ord.

6.5.5 Summary Comparison of Reuse Alternatives

A summary of total water demand for each reuse alternative is presented in Table 5-6 in Section 5.0. Alternatives 1, 2, 3, 4, and 6R would increase existing water demand on Fort Ord by factors of about 4, 3, 2, 3, and 2, respectively. These alternatives would all have the same basic impact of increasing water demand substantially above existing available supplies. Alternative 5 would decrease water demand to approximately one-half of existing use. The POM annex and reserve center would require approximately 2,800 or 3,200 af/yr, depending on whether the golf course is included. The subalternatives for Alternatives 1 and 2 would have water demands only slightly different from their respective alternatives. Development of new water supplies to meet increased water demand would create secondary environmental impacts that are potentially significant.

6.6 PUBLIC HEALTH AND SAFETY

6.6.1 Law Enforcement

6.6.1.1 Introduction

This analysis is based primarily on information contained in the Other Physical Attributes Baseline Study of Fort Ord, California, which is available for review at the public information repository established

at the Seaside Branch Library (U.S. Army Corps of Engineers, Sacramento District 1992e) and on the following:

- The currently exclusive federal jurisdiction at Fort Ord would change as lands are disposed to permit the state and local law enforcement agencies to include these areas. It is possible that concurrent legislative jurisdiction would occur for those areas leased on an interim basis.
- Army police protection programs, staff, and equipment would be retained only on the POM annex and reserve center after disposal.
- Approximately two law enforcement officers would be needed for every 1,000 residents of the Fort Ord area to provide law enforcement in proposed residential, commercial, and industrial areas. This number is based on the assumption that 1.5 officers per 1,000 residents would be needed to provide enforcement in the residential areas and that an additional 0.5 officer per 1,000 population would be needed to provide enforcement in the commercial and industrial areas. The methodology used to calculate the numbers of law enforcement officers needed for each reuse alternative is described in Table L-1 in Appendix L (Volume IV, Section 6.0).

Approximately one law enforcement ranger or officer would be needed for every 5,000 acres of open space. This number was derived from the U.S. Bureau of Land Management's estimate that two law enforcement rangers (peace-officer qualified) would be needed for 10,000 acres of open space (U.S. Bureau of Land Management pers. comm.). Refer to Table L-1 in Appendix L (Volume IV, Section 6.0).

- Some federal law enforcement officers retained by the Army for the POM annex and reserve center would provide installation security and patrol the entire installation until disposal.

This analysis assumes that the proposed action and Alternative 6R would have a substantial effect if it resulted in a need for substantial additional law enforcement staff and equipment to maintain acceptable service ratios.

6.6.1.2 Disposal Impacts

- *Impact: Need for Additional Law Enforcement to Support Interim Leases and Outgrants*

Issuing interim leases and outgrants would create the need for additional law enforcement to protect property and people. This need would exist from the time the interim uses were established until property was transferred out of Army ownership and a permanent change in use occurred.

- *Mitigation: Maintain Security Patrols in All Areas Supporting Interim Uses*

Security patrols could be maintained in the interim use areas to discourage trespassing and vandalism until land is transferred. (Contracted to local law enforcement agencies or private security agencies by the lessee)

This is considered feasible mitigation for this impact. There would be no adverse environmental impacts associated with this mitigation measure.

- *Impact: Increased Potential for Trespassing and Vandalism*

Increased trespassing and vandalism could result from leaving many buildings vacant, reducing the Fort Ord police staff, and introducing new tenants. Abandoned buildings could deteriorate and become unsafe over time, posing a threat to the safety of trespassers.

- **Mitigation: Provide Law Enforcement through Local Law Enforcement Agencies**

Local law enforcement agencies with authority over Fort Ord lands could provide law enforcement service to disposed lands. Mutual aid agreements could be maintained by all these jurisdictions to provide for rapid law enforcement response. (Monterey County sheriff or Cities of Seaside or Marina police department)

This is considered feasible mitigation for this impact. There would be no adverse environmental impacts associated with this mitigation measure.

6.6.1.3 Reuse Impacts

- **Impact: Need for Up to 39 Law Enforcement Officers and Equipment, a 73% Decrease from the Existing Staff of 144**

Implementation of this reuse alternative would require up to 39 law enforcement officers and associated equipment (e.g., vehicles, substations), which is a 73% decrease from the existing staff of 144 on-installation police officers.

- **Mitigation: Provide Law Enforcement through Local Law Enforcement Agencies**

The local jurisdictions ultimately obtaining control of the Fort Ord property could provide law enforcement service, including equipment, within their boundaries. Mutual aid agreements could be maintained by all these jurisdictions to provide for rapid law enforcement response. (Monterey County and the cities acquiring Fort Ord property)

This is considered feasible mitigation for this impact. There would be no adverse environmental impacts associated with this mitigation measure.

6.6.1.4 Cumulative Effects

Local cities have been able to maintain adequate law enforcement service, but the Monterey County Sheriff's Department has exhibited a steady decline in funding levels. Because state assistance to cities and counties for general fund expenditures is declining, it is likely that any increase in demand for law enforcement service in the Fort Ord area would be difficult to satisfy. The cumulative effect of increased demand for law enforcement and decreasing funding would be a serious concern for Alternatives 1 and 2.

Monterey County or other local jurisdictions would prepare and implement a law enforcement master plan to ensure adequate staff and equipment levels and response times. The plan would identify goals for staff levels and response times in urban, rural, and undeveloped areas. The plan would identify mechanisms that can be used to meet these goals, such as beat restructuring; mutual and automatic aid agreements; and alternative financing mechanisms, including community facilities districts and other special districts.

Approval of new development in unincorporated areas would be conditioned on availability of law enforcement service consistent with standards specified in the law enforcement master plan. Project proponents would be required to prepare a statement indicating how law enforcement needs that would be created by their project would be met from the time of building occupancy.

6.6.1.5 Summary Comparison of Reuse Alternatives

Alternative 1, Subalternative C, would have the greatest impact on local law enforcement. This alternative would generate the need for up to 566 law enforcement officers and associated equipment. Alternative 2, Subalternative A, would have the next greatest impact on law enforcement, generating the need for up to 249 law enforcement officers and associated equipment. Alternative 3 would have the next greatest

impact on law enforcement, generating the need for up to 170 law enforcement officers and associated equipment. Alternative 4 would have the next greatest impact on law enforcement, generating the need for 65 law enforcement officers and associated equipment. Alternative 6R would require 39 law enforcement officers, the least of all the "developed" alternatives. Alternative 5 would have the least impact on law enforcement, generating the need for only 13 law enforcement officers and associated equipment.

6.6.2 Fire Protection

6.6.2.1 Introduction

This analysis is based primarily on information in the Other Physical Attributes Baseline Study of Fort Ord, California, which is available for review at the public information repository established at the Seaside Branch Library (U.S. Army Corps of Engineers, Sacramento District 1992e), and on the following:

- Grazing leases and the fire control program would be maintained (including firebreak maintenance, periodic control burns, and landscape maintenance) during caretaker status.
- The existing fire protection staff and equipment contingent on Fort Ord would be maintained at a reduced staff level and would respond to the entire installation during caretaker status.
- Army fire protection programs, staff, and equipment would be retained only on the POM annex and reserve center after disposal.
- Army security patrols would be retained only on the POM annex and reserve center after disposal.
- Approximately one firefighter would be needed for every 1,000 residents of the Fort Ord area. Table L-2 in Appendix L (Volume IV, Section 6.0) describes the methodology used to calculate the numbers of firefighters needed for each reuse alternative.
- One firefighting company consisting of approximately four firefighters would be present at any given fire station on the installation. (City of Sacramento Fire Department and City of Monterey Fire Department pers. comms.)
- Additional firefighters would not be needed for wildland fire protection. This assumption is based on adequate California Department of Forestry and Fire Protection (CDF) equipment and staff in the local area. If the U.S. Bureau of Land Management acquired open space land, it would probably contract with CDF for wildland fire protection. If the lands remained unincorporated and were included in a fire district, such as the Salinas Rural Fire Protection District (SRFPD), CDF would still be responsible for wildland fire response. If the open space were incorporated, the city fire department would be responsible for wildland fire protection. (California Department of Forestry and Fire Protection pers. comm.) Refer to Table L-2 in Appendix L (Volume IV, Section 6.0).
- Fire equipment consists of fire hoses, fire trucks, fire boxes, and an adequate fire alarm system.

This analysis assumes that the proposed action and Alternative 6R would have a substantial effect it is resulted in:

- substantially intensified fire hazard or
- a need for substantial additional fire protection staff and equipment to maintain acceptable service standards.

6.6.2.2 Disposal Impacts

- **Impact: Increased Wildland and Structural Fire Hazards Following Disposal of Property by the Army**

Because Army fire response personnel and fire control and security programs would be retained only on lands owned by the Army, the potential for wildland or structure fires on disposal lands to become uncontrollable would increase. Also, the incidence of fires would increase because of the increased potential for trespassing that would occur because of the lack of security patrols.

- **Mitigation: Implement Fuel Management Program**

A fuel management program for disposed land could be prepared and implemented. Landscape maintenance, brush clearing, firebreak maintenance, grazing, control burning, and other activities would be employed to reduce fuel loads in the developed and back country areas of Fort Ord. (Local or state fire control entities)

This is considered feasible mitigation for this impact, however, implementing this mitigation may have adverse impacts on the sensitive biological communities in the fuel management program area. Refer to Section 6.11, "Vegetation, Wildlife, and Wetland Resources".

- **Mitigation: Contract with Local Fire Protection Agencies to Maintain Fire Protection Response**

Local fire protection agencies could increase staffing and equipment in the Fort Ord area to maintain fire protection response to unused portions of the installation. (Local or state fire control entities)

This is considered feasible mitigation for this impact. There would be no adverse environmental impacts associated with this mitigation measure.

- **Mitigation: Create a Special Fire Protection District to Provide Fire Protection Response**

A special fire protection district could be created to provide fire protection response on the installation before reuse. (Local jurisdictions)

This is considered feasible mitigation for this impact. However, the creation of a special district would have to be approved by both the Monterey County Local Agency Formation Commission (LAFCO) and the jurisdictions within the district. There would be no adverse environmental impacts associated with this mitigation measure.

6.6.2.3 Reuse Impacts

- **Impact: Need for Up to 18 Firefighters and Equipment (Approximately 5 Firefighting Companies), a 52% Decrease from Existing Staff of 40**

Implementation of Alternative 6R would require up to 18 firefighters and equipment and fire stations commensurate with this staffing level to provide adequate fire response to the Fort Ord area.

- **Mitigation: Provide Fire Protection through Existing Local Fire Protection Agencies**

Existing local fire protection agencies could provide fire protection to Fort Ord outside of the POM annex and the reserve center within their district boundaries. (Monterey County, California Department of Forestry and Fire Protection, and the Cities of Marina and Seaside)

This is considered feasible mitigation for this impact. There would be no adverse environmental impacts associated with this mitigation measure.

- **Mitigation: Provide Fire Protection by Establishing a Special Fire District**

Jurisdictions ultimately obtaining Fort Ord could establish a community facilities district, community services district, or other appropriate entity to provide fire protection services to the Fort Ord area outside of the POM annex and reserve center. (Local agencies with jurisdiction)

This is considered feasible mitigation for this impact. However, the creation of a special district would have to be approved by both Monterey County LAFCO and the jurisdictions within the district. There would be no adverse environmental impacts associated with this mitigation measure.

6.6.2.4 Cumulative Effects

Local cities have been able to maintain adequate fire protection response, but financing for Monterey County fire districts and California Department of Forestry has steadily decreased. Fire districts receive most of their funding from property tax revenues, which have declined since Proposition 13 passed. State fire protection funds have also decreased. Although cities would likely be able to continue to maintain adequate fire protection response on Fort Ord, Monterey County fire districts and California Department of Forestry will likely continue to have difficulty maintaining adequate fire protection service. The cumulative effect of increased demand for fire protection services and decrease funding would be a serious concern for Alternatives 1 and 2.

Monterey County, the State of California, or other local jurisdictions would prepare and implement a fire protection master plan to ensure adequate staff and equipment levels and response times. The plan would identify goals for staff levels and response times in urban, rural, and undeveloped areas. The plan would identify mechanisms that can be used to meet these goals, such as mutual and automatic aid agreements and alternative financing mechanisms, including community facilities districts and other special districts.

Approval of new development in unincorporated areas would be conditioned on availability of fire protection response consistent with standards specified in the fire protection master plan. Project proponents would be required to prepare a statement indicating how fire protection response that would be required by their project would be met from the time of building occupancy.

6.6.2.5 Summary Comparison of Reuse Alternatives

Alternative 1, Subalternative C would have the greatest impact on fire protection at Fort Ord. This alternative would generate the need for up to 283 firefighters and associated equipment. Alternative 2, Subalternative A, would have the next greatest impact on fire protection, generating the need for up to 124 firefighters and associated equipment. Alternative 3 would have the next greatest impact on fire protection, generating the need for up to 83 firefighters and associated equipment. Alternative 4 would have the next greatest impact on fire protection, generating the need for up to 31 additional firefighters and associated equipment. Alternative 6R would require only 18 firefighters, the least of the proposed "developed" alternatives. Alternative 5 would have the least impact on fire protection, generating the need for only four additional firefighters and associated equipment.

6.6.3 Medical Services

6.6.3.1 Introduction

This analysis assumes that Silas B. Hays Army Community Hospital would be closed before disposal. The effects of downsizing the hospital before closure are addressed under "Social Services" in Section II.2, "Socioeconomics" in Volume II. All on-Installation primary care clinics at Fort Ord would also close before disposal. The clinics serve active personnel and their dependents and retirees and their dependents on a space-available basis. It is assumed that the PRIMUS clinic at Presidio of Monterey would remain open and the PRIMUS clinic in Salinas would close before disposal.

For reuse alternatives, it is assumed that any hospital or regional medical center included in the alternative would be a civilian hospital that would provide medical services equivalent to the services provided by Silas B. Hays Army Community Hospital. Army personnel and their families are included in the 65,000-person capacity that is discussed for the regional medical center.

This analysis assumes that the proposed action and Alternative 6R would have a substantial effect if it resulted in a need for substantial expansion of or substantial alteration to the medical services system or substantial disruption of medical services.

6.6.3.2 Disposal Impacts

- *Impact: Need for Additional Medical Services for Users of Leased Space*

If Fort Ord property is leased or outgranted, resulting in an increased population in the Fort Ord area, the need for medical services would increase proportionately. The impacts would be similar to those described below for reuse, except that the demand would be considerably smaller.

If the Silas B. Hays Army Community Hospital or on-installation clinics are leased and in operation before disposal, additional medical services could be provided to the community and lower occupancy rates at the other area hospitals could result. Refer to the reuse discussion below for additional mitigation possibilities.

6.6.3.3 Reuse Impacts

- *Impact: Need for Medical Services for Approximately 23,000 Residents*

Alternative 6R is expected to result in approximately 23,000 residents in the Fort Ord area that would need medical services.

The need for additional medical services would be provided by surrounding facilities. Natividad Medical Center, Salinas Valley Memorial Hospital, and Community Hospital of the Monterey Peninsula would serve up to an estimated 90,000 additional residents based on 1990 admissions and occupancy rates (refer to Section 4.6, "Public Health and Safety") and allowing for service of the existing retiree population. This does not take into account potential future growth in the Monterey Peninsula area (refer to "Cumulative Effects" below).

- *Mitigation: None required*
- *Impact: Exposure of People to Lyme Disease Hazards*

Development of the installation would expose people to Lyme disease hazards. A large portion of the installation is potentially at risk from Lyme disease transferred from the *Ixodes neotomae* tick to the

Monterey dusky-footed woodrat, which acts as a reservoir for the disease. The *Ixodes pacificus* tick, which feeds on the woodrat, can become infected and can potentially transfer the disease to humans.

The Monterey dusky-footed woodrat inhabits large portions of the installation. These woodrats are solitary creatures and can be found inhabiting the maritime chaparral and oak woodland areas. Refer to the Flora and Fauna Baseline Study of Fort Ord, California (U.S. Army Corps of Engineers, Sacramento District 1992a) for specific population areas.

People that frequent the open space areas of the installation for recreational purposes would be at risk of getting Lyme disease through the bite of an infected *Ixodes pacificus* tick.

- **Mitigation: Educate Area Residents and Recreational Users on Lyme Disease Symptoms and Modes of Transmission**

A program could be required to educate all residents and recreationists and other people with business in the area on Lyme disease symptoms, modes of transmission, and tick avoidance measures before any of the "at-risk" portions of the installation (i.e., the developed portions of the oak woodland and the maritime chaparral areas are occupied). (Local health organizations and private entities)

This is considered feasible mitigation for this impact. There are no adverse environmental impacts associated with this mitigation measure.

- **Mitigation: Implement a Tick Control Program**

An experimental tick control program being tested by disease researchers could be implemented to control the tick population. The woodrat is also known as the pack rat because of the wide variety of materials it uses to build its nest. This experimental program consists of placing a special insecticide on cotton balls that would be placed in woodrat habitat and eventually picked up by the woodrat and carried to its nest. This insecticide is not harmful to the woodrat, but would kill any ticks in the nest. Results on the effectiveness of this experimental program are not yet available. (Local disease control agencies)

This is considered feasible mitigation for this impact. There are no adverse environmental impacts associated with this mitigation measure.

6.6.3.4 Cumulative Effects

Projected growth in the Monterey County region, not including Fort Ord, is expected to range from 60,000 to 100,000 by 2035 (refer to Section 4.2, "Socioeconomics"). Any alternative that results in a need for additional services would have a cumulative effect when combined with the regional growth expected independent of Fort Ord reuse.

6.6.3.5 Summary Comparison of Reuse Alternatives

Alternative 1 would have the greatest impact on medical services in the Monterey County area, with needs ranging from service for 70,000 to 157,000 residents depending on the subalternative. Alternative 5 includes no hospital and no additional residents, so there is no additional need for medical services. Alternatives 2, 3, 4, and 6R result in no impacts on medical services.

6.6.4 Emergency Medical Services

6.6.4.1 Introduction

For the purposes of this analysis, it is assumed that Silas B. Hays Army Community Hospital would be closed before disposal and that on-installation ambulance service will also be terminated before disposal.

Military beneficiaries outside Fort Ord will continue to use private ambulance services. The Army will maintain ground ambulance service for military personnel at Fort Hunter Liggett, as well as MAST at Fort Hunter Liggett. Air transport services will be provided by local governments or private companies. Rescue services will be provided by MAST at Fort Hunter Liggett and Coast Guard in San Francisco. Disaster assistance will still be provided through the Federal Emergency Management Agency, although the availability of local Army assistance will be reduced.

For analysis of reuse alternatives, it is assumed that any hospital or regional medical center in the alternatives would provide the necessary emergency medical services (ambulance service and emergency room facilities) to handle 65,000 beneficiaries. To estimate ambulance trips expected with each reuse alternative, a ratio of one ambulance trip per year per 60 people is used (Peninsula Paramedics pers. comm.).

This analysis assumes the proposed action and Alternative 6R would have a substantial effect if it resulted in:

- need for substantial expansion of or substantial alteration to the emergency medical services system, or
- substantial disruption of existing services.

6.6.4.2 Disposal Impacts

If property outside the POM annex is leased or outgranted, resulting in an increased population in the Fort Ord area, the need for emergency medical services would increase proportionately. The expected impacts would be similar to but considerably less than those described below for reuse.

6.6.4.3 Reuse Impacts

- *Impact: Need for Emergency Medical Services for Approximately 23,000 Residents*

Alternative 6R is expected to result in approximately 23,000 residents in the Fort Ord area that would need emergency medical services, including ambulance service (approximately 380 additional ambulance trips per year), emergency room treatment, and air transport. The need for emergency medical services would be provided by surrounding facilities. Natividad Medical Center, Salinas Valley Memorial Hospital, and Community Hospital of the Monterey Peninsula would serve up to an estimated 90,000 additional residents based on 1990 admissions and occupancy rates (refer to Section 4.6, "Public Health and Safety") and allowing for service of the existing retiree population. There is, therefore, no need for additional emergency medical service.

- *Mitigation: None required*
- *Impact: Potential for Increased Response Times for Emergency Services at Fort Ord*

Depending on the design of the streets in the reuse alternative, there is the potential that ambulance response times could increase beyond 8 minutes for over 10% of the time. This is an industry standard and would result in a substantial effect if not met.

- *Mitigation: Incorporate Improved Access to Reuse Areas*

The specific design of the reuse alternatives could incorporate future street designs that facilitate low emergency response times. (Local agencies and private entities responsible for development)

This is considered feasible mitigation. Adverse environmental impacts that would be associated with this mitigation measure would be related to impacts resulting from either street construction

or street alterations and/or widenings. Refer to Section 6.7, "Traffic and Circulation", for specific information on these impacts.

- **Mitigation: Reserve Area Adjacent to Major Roadways on Fort Ord for Establishment of an Ambulance Service**

To enhance response times, an area could be provided adjacent to major roadways on Fort Ord for establishing an ambulance service. (Local agencies and private entities responsible for development)

This is considered feasible mitigation. Adverse environmental impacts that would be associated with this mitigation measure would be related to impacts resulting from either street alterations and/or widenings. Refer to Section 6.7, "Traffic and Circulation", for specific information on these impacts.

6.6.4.4 Cumulative Effects

Projected growth in the Monterey County region, not including Fort Ord, is expected to range from 60,000 to 100,000 by 2035 (refer to Section 4.2, "Socioeconomics"). Any alternative that results in need for additional services would have a cumulative effect when combined with the regional growth expected independent of Fort Ord reuse.

6.6.4.5 Summary Comparison of Reuse Alternatives

Alternative 1 would have the greatest impact on emergency medical services in the Monterey County area, with needs ranging from service for 160,000 to 247,800 residents depending on the subalternative. Alternative 2 results in needs ranging from services for 26,000 to 58,400 residents. Alternatives 3, 4, and 6R result in no impacts on emergency medical services. Alternative 5 includes no hospital and no additional residents, so there is not additional need for, or surplus of, emergency medical services.

6.6.5 Seismic Safety

6.6.5.1 Introduction

The location and severity of seismic hazards on Fort Ord are described in Section 4.3, "Soils, Geography, Topography, and Seismicity", and in the Soils Baseline Study for Fort Ord, California (U.S. Army Corps of Engineers, Sacramento District 1992d). Seismic hazards to structures are described in Section 6.3, "Soils, Geology, Topography, and Seismicity". The following section describes seismic hazards to people living or working at Fort Ord.

6.6.5.2 Disposal Impacts

- **Impact: Exposure of People to Potential Seismic Events Resulting from Issuance of Interim Leases or Outgrants**

By issuing interim leases and outgrants, additional people are likely to move onto Fort Ord before property transfer. Fort Ord has a high risk for seismic events and many of the structures on the installation were constructed before strict seismic-related construction standards were developed. This situation represents a substantial risk to the safety of people occupying interim-leased space.

- **Mitigation: Modify Leased Structures to Meet Current Codes**

Before occupancy, leased buildings could be upgraded to meet current state and local building codes. (Local agencies and private entities responsible for development)

This is considered feasible mitigation for this impact. There would be no adverse environmental impacts associated with this mitigation measure, however, identifying and modifying these structures would be expensive and could potentially create an economic burden on the responsible parties.

6.6.5.3 Reuse Impacts

- *Impact: Exposure of Approximately 44,500 People to Potential Seismic Events*

Buildout of the Alternative 6R would locate approximately 44,500 people (based on residential and employment population) in a high seismic risk area.

- *Mitigation: Construct New or Modify Existing Structures to Meet Building Codes*

This mitigation is described in Section 6.3, "Soils, Geology, Topography, and Seismicity". This is considered feasible mitigation for this impact. There would be no adverse environmental impacts associated with this mitigation measure, however, identifying and modifying these structures would be expensive and could potentially create an economic burden on the responsible parties.

- *Impact: Exposure of Coastline Development to Tsunamis*

The Alternative 6R proposes a multi-use area which includes Stilwell Hall. This facility is located on the cliffs overlooking the beach area and could be susceptible to damage caused by a tsunami, a tidal wave resulting from a seismic event.

- *Mitigation: Avoid Reuse of Stilwell Hall*

Plans for the multi-use area under Alternative 6R could be modified to eliminate use of Stilwell Hall, until it has been determined by detailed engineering studies that the facility could withstand a seismic event of a magnitude to cause substantial damage to the facility. (Local agencies)

This is considered feasible mitigation for this impact. There would be no adverse environmental impacts associated with this mitigation measure, however, preparing a detailed engineering study and modifying this structure would be expensive and could potentially create an economic burden on the responsible parties as well as delay the reuse of the facility.

6.6.5.4 Cumulative Effects

There would be no cumulative seismic safety impacts.

6.6.5.5 Summary Comparison of Reuse Alternatives

Alternative 1 would generate the most population and therefore expose the most people to potential seismic events. Alternative 2 would generate the next greatest number of people exposed to potential seismic events. Alternatives 3, 6R, and 4 would generate the next greatest number of people exposed to seismic events (in that order); however, Alternative 4 may generate more people exposed to potential seismic events if most of the reuse proposals include retaining a majority of the existing buildings on the installation. Alternative 5 would not generate additional population and therefore would expose the least number of people to potential seismic events.