2 PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

This chapter identifies and describes the alternatives for implementing the proposed action. The no action alternative is also described, and the preferred alternative is identified. The alternatives are also compared in summary form in a table at the end of this chapter. The ACW destruction systems chosen for analysis, including siting requirements at each installation, are described in Chapter 3.

2.2 PROPOSED ACTION

The authorizing legislation for PMACWA instructed DOD to "demonstrate not less than two alternatives to the baseline incineration process for the demilitarization of assembled chemical munitions." In the *National Defense Appropriations Act for Fiscal Year 1999*, Congress directed DOD to continue managing the development and testing of technologies that are potential or demonstrated alternatives to the baseline incineration program for the destruction of ACWs. Management was to include planning for the pilot testing of alternative technology systems.

To comply with these directions, DOD proposes to design, construct, and operate one or more pilot test facilities for ACW destruction systems at one or more chemical weapons stockpile installations. This action would occur simultaneously with any existing chemical weapons destruction or demilitarization programs and schedules at these installations. The design, construction, and operation of ACW pilot test facilities are further described in Chapter 3.

The following describes the schedule assumed in this EIS for the construction and testing of an ACWA pilot facility. Final design and permitting of a facility would take from one to two years. Facility construction would require up to 34 months. The EIS assumes that a pilot test would take up to 36 months, although the amount of time could be shorter. Finally, it is assumed that facility closure would take up to 24 months. This general schedule, however, may vary, depending on installation.

A stakeholder group designated "The Dialogue" (described in Chapter 1) was instrumental in the development of alternative systems for destroying ACWs. In concert with The Dialogue, the PMACWA developed criteria to evaluate alternative technologies for possible

implementation in overall destruction systems. The criteria were organized into four categories (PMACWA 1999):

- *Process efficiency/process performance:* This category includes performance, maturity, operability, process monitoring and control, and applicability criteria.

- *Safety/worker health and safety:* This category includes criteria for worker safety, normal operations and facility accidents, and public safety during facility accidents as well as off-site accidents.

- *Human health and environment:* This category includes criteria for effluent characterization, completeness of effluent characterization, effluent management, permitting and compliance, and resource requirements.

- *Potential for implementation:* This category includes life-cycle cost, schedule, and public acceptance criteria.

Twelve firms responded to a PMACWA request for proposals (RFPs) for alternative destruction systems. From these twelve, PMACWA selected six for demonstration testing on the basis of evaluations based on the first three categories of evaluation criteria. Initially, funding was available to demonstrate only three of the six technologies. Subsequent Congressional legislation provided funding to demonstrate the remaining three technologies. PMACWA performed a series of technology demonstrations to investigate and evaluate the potential for implementing the alternative technologies as full-scale integrated processes. On the basis of all four criteria categories, PMACWA determined that four technology systems were viable for further development and pilot testing. These four technology systems are assessed in this EIS. These alternative ACWA systems (identified by the process used to destroy energetics and agents) are capable of disassembling the munitions and treating the dunnage and metal parts, destroying the agent and energetics, and disposing of resulting residues and effluents.

After the issuance of this Final ACWA EIS and the ROD, the Defense Acquisition Executive (DAE) will decide whether an ACWA technology will be implemented and where (i.e., at which installation) it will be implemented. The major criteria for the technology selections will be

- Cost,

- Schedule,

- Safety, and

- Environment.

The process that culminates in the DAE technology selection is called a Defense Acquisition Board (DAB) review. The DAB review will consist of Integrated Product Team (IPTs) who will analyze, exchange, and manage information. Three Working IPTs (WIPTs) will be formed to address the major criteria listed above. Output from these WIPTs will be provided to an Integrating Integrated Product Team (IIPT) and Overarching Integrated Product Team (OIPT), who will report to the DAE. The DAE will consider all information from these IPTs before making the technology decision. Also, as required by Public Law 104-208, each ACWA technology will have to be "certified" with regard to cost, safety, environment, and schedule before being considered in the DAE technology selection.

This particular review will be unlike most standard DAB/DAE reviews, which evaluate only one program. This review will take into account a Major Defense Acquisition Program (i.e., PMCD) and a research and development (R&D) program (i.e., PMACWA). PMCD and PMACWA have separate reporting chains; PMCD reports to the Department of the Army, while PMACWA reports to the Office of the Secretary of Defense. Because of these complexities, the process has been tailored to accommodate a multi-program-manager environment.

2.3 INSTALLATIONS

Potential installations that could be used for pilot testing ACW destruction systems must have stockpiles with sufficient ACWs available for testing. An evaluation of the 1999 stockpiles and destruction schedules identified four reasonable alternative installations: ANAD, PBA, PCD, and BGAD (Table 2.1-1). Other installations were judged not to be reasonable alternatives for the following reasons.

- Chemical stockpiles at Aberdeen Proving Ground in Maryland and Newport Chemical Depot in Indiana were eliminated from further consideration in this EIS because there are no ACWs at these locations.

- Johnston Atoll in the Pacific Ocean was eliminated from further consideration in this EIS because all chemical weapons at the installation were destroyed in early 2001.

- Deseret Chemical Depot in Utah and Umatilla Chemical Depot in Oregon were eliminated from further consideration in this EIS because it is unlikely that an ACWA pilot facility could begin testing before the stockpiles at these installations have been destroyed by ongoing operations. The earliest date for ACWA pilot tests to begin startup and system checks is January 2006 (PMACWA 1999).

TABLE 2.1-1 Completion Dates for Assembled Chemical Weapons Destruction by PMCD

Installation	Completion Date[a]
Anniston Army Depot	First quarter, 2009
Bluegrass Army Depot	NS[b]
Deseret Chemical Depot	Third quarter, 2005
Pine Bluff Arsenal	Second quarter, 2008
Pueblo Chemical Depot	NS
Umatilla Chemical Depot	Fourth quarter, 2008

[a] First quarter: January, February, March; second quarter: April, May, June; third quarter: July, August, September; and fourth quarter: October, November, December.

[b] NS = chemical destruction system not yet selected.

Source: U.S. Army (2001).

- On September 26, 2001, new stockpile destruction schedules were published that indicated later completion dates for Umatilla Chemical Depot. DOD is evaluating Umatilla to determine if sufficient ACWs would remain by 2006 to support pilot testing. If so, then the ACWA EIS would be supplemented.

2.4 ALTERNATIVE ACW DESTRUCTION SYSTEMS

The ACW destruction systems evaluated in this ACWA EIS are alternatives to baseline or other incineration technologies. According to DOD's definition, baseline incineration incorporates the technology and process design in place at the Johnston Atoll Chemical Agent Disposal System (JACADS). Baseline incineration systems are also in use at the Tooele Chemical Agent Disposal Facility (TOCDF) located at the Deseret Chemical Depot in Utah, and they have been or are under construction at three other chemical weapon stockpile storage locations, including ANAD and PBA. PMACWA is not considering any type of incineration technology for pilot testing. However, ACW destruction systems evaluated in this ACWA EIS may incorporate the reverse assembly process, which is the method used to open ACWs and access energetic materials and agents before they are destroyed. Reverse assembly is also used in baseline incineration (CBDCOM 1997).

2.4.1 Neutralization Followed by Biological Treatment (Neut/Bio)

This alternative would first disassemble the munitions to access the agents and energetics, and then it would destroy the blister agents and energetics with water and caustic chemicals (neutralization). The products of the neutralization would then be treated in a biological process operated at temperatures and pressures near ambient conditions. Air emissions would be passed through an air pollution control process. Recovered metal parts and dunnage would be treated at high temperatures. Effluents could be held and tested before being released to pollution control processes. Process water would be reused, and remaining solid residues would be disposed of in an appropriate landfill. The PMACWA considers this technology a viable solution for demilitarization of ACWs containing mustard agent but not for ACWs containing nerve agents (PMACWA 1999). The ACW destruction system based on this technology is described further in Chapter 3.

2.4.2 Neutralization Followed by Supercritical Water Oxidation (Neut/SCWO)

This alternative would first disassemble the munitions to access the agents and energetics, and then it would destroy the agents and energetics with water and caustic chemicals (neutralization). The products of the neutralization and shredded dunnage would then be destroyed by the SCWO process. SCWO would mineralize the resulting chemicals at temperatures and pressures above the critical point of water (705.2°F [340°C] and 3,204.6 pounds per square inch absolute [psia]). Recovered metal parts would be washed with caustic chemicals and treated at high temperatures. Effluents could be held and tested before being released to pollution control processes. Process water would be reused, and remaining solid residues would be disposed of in an appropriate landfill. The PMACWA considers this technology a viable solution for the demilitarization of all ACWs (PMACWA 1999). The ACW destruction system based on this technology is further described in Chapter 3.

2.4.3 Neutralization Followed by Gas-Phase Chemical Reduction and Transpiring Wall Supercritical Water Oxidation (Neut/GPCR/TW-SCWO)

This alternative would first disassemble the munitions to access the agents and energetics, and then it would destroy the agents and energetics with water and caustic chemicals (neutralization). The products of the neutralization would then be destroyed by the SCWO process. SCWO would mineralize the resulting chemicals at temperatures and pressures above the critical point of water. In this alternative, the TW-SCWO reactor vessel would be protected from corrosion and mineral buildup by a perforated liner through which water would be continuously forced to form a protective layer. Metal parts and dunnage would be washed with caustic chemicals and subjected to a gas-phase chemical reduction process in a high-temperature hydrogen and steam atmosphere. Air emissions could be held and tested before being released to pollution control processes. Process water would be reused, and remaining solid residues would be disposed of in an appropriate landfill. The PMACWA considers this technology a viable

solution for the demilitarization of all ACWs (PMACWA 2001). The ACW destruction system based on this technology is further described in Chapter 3.

2.4.4 Electrochemical Oxidation

This alternative would first disassemble the munitions to access the agents and energetics, and then it would destroy the agents and energetics and shredded dunnage in a separate electrochemical oxidation process. The slurry of agent or energetics would be fed into a cell where an electric current would flow through a semipermeable membrane between an anode and cathodes in a silver nitrate and nitric acid bath, oxidizing the organic materials. Nitrogen oxides (NO_x) produced by the process would be reformed to nitric acid and reused. Silver would also be recovered and reused. Recovered metal parts and dunnage would be treated at high temperatures in a steam environment. Air emissions would be passed through an air pollution control process. Effluents could be held and tested before being released to pollution control processes. Solid residues would be disposed of in an appropriate landfill. The PMACWA considers this technology a viable solution for the demilitarization of all ACWs (PMACWA 2001). The ACW destruction system based on this technology is further described in Chapter 3.

2.5 NO ACTION ALTERNATIVE

If the PMACWA decides not to proceed with the design, construction, and operation of a pilot facility, no ACWA pilot plant facilities would be constructed and operated at any of the four installations. The portion of the ACW stockpile that would be used for pilot testing would remain in storage, as would the rest of the ACW stockpile. Under either the proposed action or no action alternative, ACWs would continue to be stored until their destruction by DOD. The means of destruction available for the ACW stockpile would depend on the ongoing or planned construction of facilities at ANAD and PBA and on the results from the evaluation of alternatives being included in the PMCD EISs for PCD and BGAD. Munitions being stored until their destruction by DOD would remain in their existing storage location and be maintained in their existing condition. It is assumed that the current munitions management procedures would continue to be followed and that the munitions would be safeguarded against any release to the environment.

2.5.1 Destruction of ACWs at Pine Bluff Arsenal and Anniston Army Depot

An incinerator for the destruction of ACWs has been constructed at ANAD and is under construction at PBA. If ACWA pilot testing is not conducted at those installations, the ACWs that might otherwise have been used for ACWA pilot testing would be destroyed by the incineration facility.

2.5.2 Pueblo Chemical Depot and Blue Grass Army Depot

If a pilot test facility is not sited, constructed, or operated at PCD or BGAD, the ACWs that would be destroyed during pilot testing at these installations would remain in storage with the rest of the stockpile. DOD is currently preparing the PCD EIS and the BGAD EIS to select a destruction system for the stockpiles at these installations. The weapons in storage at these installations would be destroyed after the systems announced in the RODs for those EISs were constructed. If one or more of the RODs did not announce the selection of a destruction technology, the ACWs at the affected installation would remain in storage until a destruction technology was developed.

2.6 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL

2.6.1 Other Technologies

P.L. 105-261 authorized the PMACWA to proceed with activities for the design, construction, and operation of a pilot facility after the "technology has been demonstrated to be successful." Congress did not authorize the PMACWA to advance technologies that have not been successfully demonstrated to the pilot stage. Therefore, systems based on processes or technologies not successfully demonstrated are not reasonable alternatives for this EIS. Two systems are in this category: (1) a system based on plasma arc technology and (2) a system that uses fluid-abrasive cutting and fluid mining with ammonia to access agent and energetics. The agent and energetics are then destroyed by solvated electron technology (SET), which uses sodium metal and ammonia in the initial destruction process and then oxidizes reaction products.

In the PMACWA demonstration testing, the particular plasma arc process that was evaluated was not validated for agent destruction because of its lack of maturity. Although the plasma arc process incorporates technology that is in industrial and commercial use, the marginal performance of the equipment, the continued modifications to the equipment, and the redesign of the equipment throughout the demonstration phase indicated that it might be difficult to develop plasma arc technology into a full-scale, integrated system. The PMACWA therefore does not consider such a system to be a viable solution for the demilitarization of ACWs (PMACWA 1999).

The SET process, like the plasma arc process, has the potential to demilitarize ACWs. However, the SET process was not validated for the destruction of products that result from processing agents and energetics, since the required demonstration tests were not completed. Consequently, the PMACWA does not consider the SET process to be a viable total solution for the demilitarization of ACWs at this time (PMACWA 2001).

2.6.2 Transportation of ACWs to Another Site for Pilot Tests

Transportation of the ACWs from one stockpile installation to another is not an alternative because such an action would be prohibited per 50 USC 1512a (a): "The Department of Defense may not transport any chemical munition that constitutes part of the chemical weapons stockpile out of the state in which that munition is located on October 5, 1994. . . ." Consequently, transportation to another installation would not be possible as part of the ACWA program.

2.7 SUMMARY COMPARISON OF ALTERNATIVES

Four tables (Tables 2.7-1 through 2.7-4, placed at the end of this chapter) summarize the results of the assessments of the impacts from construction and normal operations of the appropriate alternative technologies at each of the four installations and the impacts from construction and operations under the no action alternative at each installation. The impacts associated with accidents at each installation are discussed separately in each installation chapter (Chapters 4, 5, 6, and 7). Cumulative impacts also are discussed separately in each installation chapter.

For the majority of impact areas considered at each installation, the technology alternatives had similar impacts. In most cases, the no action alternative had no impacts. Distinctions among the technologies did, however, occur in the areas of utility requirements, human health and safety, and socioeconomics. In all cases, the impacts associated with construction and normal operations were not significant. The impacts that might occur would be short-term.

2.8 PREFERRED ALTERNATIVE

DOD prefers the proposed action, which is to pilot test one or more technologies at one or more installations. On the basis of the environmental analysis contained in this FEIS, the preferred alternative(s) are discussed below for each installation.

At ANAD, four alternative technology systems were examined: Neut/Bio, Neut/SCWO, Neut/GPCR/TW-SCWO, and Elchem Ox. None of the systems evaluated would have a significant effect on the human environment. The preferred alternative at ANAD is No Action.

At PBA, three alternative technology systems were examined: Neut/SCWO, Neut/GPCR/TW-SCWO, and Elchem Ox. None of the systems evaluated would have a significant effect on the human environment. The preferred alternative at PBA is No Action.

AT PCD, two alternative technology systems were examined, as specified by P.L. 106-398: Neut/Bio and Neut/SCWO. Neither of the systems evaluated would have a significant effect on the human environment. The preferred alternative at PCD is Neut/Bio. Additionally, the Army will look for ways to accelerate the demilitarization process.

At BGAD, four alternative technology systems were examined: Neut/Bio, Neut/SCWO, Neut/GPCR/TW-SCWO, and Elchem Ox. None of the systems evaluated would have a significant effect on the human environment. The preferred alternative at BGAD is No Action at this time. The Army will continue analysis in the site-specific EIS by PMCD, which will preserve options for deployment of a full-scale pilot plant. Additionally, the Army will look for ways to accelerate the demilitarization process.

The ROD for this NEPA action will announce the decision on pilot testing ACWA technology systems. This decision will be based on the results of the environmental impact analysis presented in this FEIS, as well as other factors. These other factors will include, but are not limited to, mission needs, budget, other programmatic factors, and installation-specific factors.

2.9 REFERENCES FOR CHAPTER 2

CBDCOM, 1997, *Solicitation No. DAAM01-97-R-0031*, U.S. Army Chemical and Biological Defense Command, Aberdeen Proving Ground, Md., Aug.

PMACWA, 1999, *Assembled Chemical Weapons Assessment Program: Supplemental Report to Congress*, U.S. Department of Defense, Program Manager Assembled Chemical Weapons Assessment, Aberdeen Proving Ground, Md., Sept. 30.

PMACWA, 2001, *Final Technical Evaluation: AEA Technology/CH2MHill SILVER II Electrochemical Oxidation, Foster Wheeler/Eco Logic International/Kvaerner Neutralization/ GPCR/TW-SCWO, Teledyne-Commodore Solvated Electron Systems,* Appendix C in *Assembled Chemical Weapons Assessment Program: Supplemental Report to Congress*, June 2001, U.S. Department of Defense, Program Manager Assembled Chemical Weapons Assessment, Aberdeen Proving Ground, Md., March.

U.S. Army, 2001, *U.S. Army Chemical Demilitarization Program Releases Updated Official Schedule and Cost Estimates,* press release, Program Manager for Chemical Demilitarization, Aberdeen Proving Ground, Md., Oct. 4.

TABLE 2.7-1 ANAD Summary Table[a]

Environmental Consequence	Neutralization/ Biotreatment	Neutralization/ Supercritical Water Oxidation	Neutralization/Gas-Phase Chemical Reduction/ Transpiring Wall Supercritical Water Oxidation	Electrochemical Oxidation	No Action
Land use	All systems: Land requirements for the facility and additional infrastructure could total 30 to 77 acres. Impacts on and off the installation would be negligible because proposed activities would take place in the Chemical Limited Area. Normal operations would be consistent with installation use and would not significantly adversely affect other continuing installation operations.				No impacts
Infrastructure					
Electric power supply	All systems: Current infrastructure would not be able to meet the needs for the pilot facility. New service connections would have to be added, and a new substation would need to be constructed. The new power supply infrastructure would be independent of the other ANAD power supply.				No impacts.
	36 GWh/yr would be required.	60 GWh/yr would be required.	26 GWh/yr would be required.	105 GWh/yr would be required.	
Natural gas and fuel oil supply	All systems: The current infrastructure would be likely to meet the needs, although new pipelines might be needed to extend the system The fuel oil requirement is 48,000 gal/yr.				No impacts.
	50 million scf/yr of natural gas would be required.	69 million scf/yr of natural gas would be required.	130 million scf/yr of natural gas would be required.	48 million scf/yr of natural gas would be required.	
Water supply and use					
Construction	All systems: Construction would require water for a variety of uses. These needs have not been quantified; however, estimated use would be small compared with existing capacity. The existing system could meet these needs.				No impacts since there would be no construction.
Operations	All systems: The existing water supply system would be sufficient if pipeline extensions were built. The existing system would not be adequate to meet peak water demands for emergencies. About 7.5 million gal/yr of sanitary sewage would be produced. Current sewage treatment capacity would need to be expanded.				No impacts.
	7 million gal/yr of process water required; 6.4 million gal/yr of potable water required.	8.3 million gal/yr of process water required; 6.4 million gal/yr of potable water required.	18 million gal/yr of process water required; 6.4 million gal/yr of potable water required.	1 million gal/yr of process water required; 6.4 million gal/yr of potable water required.	

TABLE 2.7-1 (Cont.)

Environmental Consequence	Neutralization/ Biotreatment	Neutralization/ Supercritical Water Oxidation	Neutralization/Gas-Phase Chemical Reduction/ Transpiring Wall Supercritical Water Oxidation	Electrochemical Oxidation	No Action
Waste management and facilities					
Construction	All systems: No changes in ANAD waste management systems would be needed for management and disposal of these construction wastes. Construction would generate solid and liquid nonhazardous waste.				No impacts since there would be no construction.
	It would also generate 80 yd^3 of solid hazardous waste and 32,000 gal of liquid hazardous waste.	It would also generate 80 yd^3 of solid hazardous waste and 34,000 gal of liquid hazardous waste.	It would also generate 90 yd^3 of hazardous solid waste and 36,000 gal of liquid hazardous waste.	It would also generate 100 yd^3 of hazardous solid waste and 39,000 gal of liquid hazardous waste.	
Operations	All systems: Hazardous and nonhazardous solid wastes would be generated during the treatment processes. These solid wastes would be collected and disposed of off post at appropriately permitted facilities. Quantities of brine salts produced by all technologies would vary, depending on the agent to be destroyed. Nonprocess solid wastes could be contaminated with agent and would also require treatment. If these treatment residual wastes are defined as RCRA hazardous waste, the estimated volume of hazardous waste would be larger, and additional treatment might be necessary before disposal. Process and nonprocess liquid wastes would be recycled within the treatment process. The only liquid waste associated with ACWA facilities that would be discharged would be domestic sanitary wastewater.				No impacts.

TABLE 2.7-1 (Cont.)

Environmental Consequence	Neutralization/ Biotreatment	Neutralization/ Supercritical Water Oxidation	Neutralization/Gas-Phase Chemical Reduction/ Transpiring Wall Supercritical Water Oxidation	Electrochemical Oxidation	No Action
Operations (Cont.)	Treatment of ACWs would produce 970 tons of residual brine, which is a hazardous waste, and 550 tons of hazardous biomass. No significant impacts are expected.	Treatment of ACWs would produce brine salts ranging from 1,000 to 1,900 tons. No significant impacts are expected.	The TW-SCWO system and GPCR unit would produce hazardous salts as waste. The total salts produced would range from 1,000 to 2,200 tons. No significant impacts are expected.	Silver chloride salt cake would be produced and sent for silver recovery. The remaining salts, solids, and other impurities would be disposed of as hazardous waste. The amount would vary from 250 to 1,200 tons). Small amounts of dilute nitric acid would be neutralized and disposed of as a hazardous liquid. Treatment of ACWs would result in additional residual brine waste of 110 to 170 tons.	
Air quality — criteria pollutants					
Construction	All systems: Emissions of criteria pollutants would include fugitive dust from earth-moving activities and exhaust emissions from equipment and vehicles. Exhaust emissions would be relatively small when compared with fugitive dust. PM_{10} and $PM_{2.5}$ concentration increments would be relatively small fractions of applicable NAAQS. The total 24-hour and annual concentrations of $PM_{2.5}$ (background and increment) would be below but close to applicable NAAQS as a result of high background concentrations.				No impacts since there would be no construction.
Operations	All systems: Estimated maximum concentration increments would contribute less than 9% of applicable NAAQS for all pollutants. Except for 8-hour CO and $PM_{2.5}$, total concentrations of criteria pollutants (background plus increment) would be less than or equal to 53% of NAAQS. CO and $PM_{2.5}$ would be close to, but still below, standards because of high background levels.				Impacts on air quality expected to be minimal.

TABLE 2.7-1 (Cont.)

Environmental Consequence	Neutralization/ Biotreatment	Neutralization/ Supercritical Water Oxidation	Neutralization/Gas-Phase Chemical Reduction/ Transpiring Wall Supercritical Water Oxidation	Electrochemical Oxidation	No Action
Air quality — toxic air pollutants					
Construction	All systems: Impacts would be negligible. Minor emissions would result from construction equipment.				No impacts since there would be no construction.
Operations	All systems: Routine operations: Pilot facility would not be a major source of HAP emissions and would not fall under any of the source categories regulated by the EPA under NESHAP. Fluctuating operations: No agent emissions would be expected. Modeling of worst-case emissions resulted in estimated ambient agent concentrations of less than 1% of the allowable concentrations for general population exposure established by the CDC.				No impacts.
Human health and safety — routine operations					
Construction	Facility workers: Estimated annual fatalities: <1 Estimated annual injuries: 18	Facility workers: Estimated annual fatalities: <1 Estimated annual injuries: 23	Facility workers: Estimated annual fatalities: <1 Estimated annual injuries: 23	Facility workers: Estimated annual fatalities: <1 Estimated annual injuries: 24	No impacts since there would be no construction.
	All systems: Other on-post workers: There would be no adverse health impacts. Off-post public: There would be no adverse health impacts.				
Operations	Facility workers: Estimated annual fatalities: <1 Estimated annual injuries: 31	Facility workers: Estimated annual fatalities: <1 Estimated annual injuries: 31	Facility workers: Estimated annual fatalities: <1 Estimated annual injuries: 31	Facility workers: Estimated annual fatalities: <1 Estimated Annual injuries: 31	Facility workers: Estimated annual fatalities: <1 Estimated annual injuries: 4

TABLE 2.7-1 (Cont.)

Environmental Consequence	Neutralization/ Biotreatment	Neutralization/ Supercritical Water Oxidation	Neutralization/Gas-Phase Chemical Reduction/ Transpiring Wall Supercritical Water Oxidation	Electrochemical Oxidation	No Action
Operations (cont.)	All systems: Other on-post workers: Estimated hazard indices and carcinogenic risks from inhalation of toxic air pollutants are well below benchmarks considered representative of negligible risk levels. No agent emissions are expected. Even under hypothetical worst-case emission levels, the maximum estimated on-post concentration would be less than 1% of the allowable concentration for general public exposures. The maximum estimated incremental cancer risk from the inhalation of hypothetical mustard emissions is well below the benchmark risk value. Off-post public: Estimated hazard indices and carcinogenic risks from inhalation of toxic air pollutants are well below benchmarks considered representative of negligible risk levels. No agent emissions are expected, but even under hypothetical worst-case emission levels, the maximum estimated off-post concentration would be less than 1% of the allowable concentration for general public exposures. The maximum estimated incremental cancer risk from the inhalation of hypothetical mustard emissions is well below the benchmark risk value.				No impacts.
Noise					
Construction	All systems: Construction activities would result in maximum estimated noise levels of approximately 48 dBA at the installation boundary closest to a proposed construction site. This level is below the EPA guideline of 55 dBA for residential zones. Potential noise impacts are expected to be minor to negligible at the nearest residence.				No impacts since there would be no construction.
Operations	All systems: Noise levels generated by operation should have negligible impacts on the residence located nearest to the proposed facility and would be well within EPA guideline limits for residential areas.				Levels of noise generated by current stockpile maintenance activities would be part of the background noise levels.
Visual resources					
Construction	All systems: No effect on visual character.				No impacts since there would be no construction.
Operations	All systems: ACWA facility would be consistent with surrounding land uses and would not adversely affect visual character. Operation would not create significant visible emissions.				No impacts.

TABLE 2.7-1 (Cont.)

Environmental Consequence	Neutralization/ Biotreatment	Neutralization/ Supercritical Water Oxidation	Neutralization/Gas-Phase Chemical Reduction/ Transpiring Wall Supercritical Water Oxidation	Electrochemical Oxidation	No Action
Geology and soils					
Construction	All systems: Approximately 25 acres of ground could be disturbed to some degree from construction of the pilot facility. Development of utilities could also cause additional soil disturbance. This could result in increased potential for erosion, which, in turn, could affect surface water bodies and biological resources. Best management practices would be used to minimize potential for erosion.				No impacts since there would be no construction.
Operations	All systems: Concentrations of contaminants from operations would be so low that they would have no impact on surface soils.				No impacts.
Groundwater					
Construction	All systems: Impacts would be none to negligible, and if impacts did occur, they would be temporary and short-lived. Water use during construction is estimated to be 7 million gal over three years. This is about 0.02% of the minimum yield of Coldwater Spring and would have a negligible impact on the water supply from the spring. Impacts on the groundwater aquifer would also be negligible. Construction would generate 4.5 million gal of sanitary waste over the same period of time.				No impacts since there would be no construction.
Operations	Use of 14 million gal/yr is about 0.04% of the minimum flow of Coldwater Spring.	Use of 15 million gal/yr is slightly more than 0.04% of the minimum flow of Coldwater Spring.	Use of 24 million gal/yr is slightly more than 0.2% of the minimum flow of Coldwater Spring.	Use of slightly more than 7 million gal/yr is about 0.02% of the minimum flow of Coldwater Spring.	No impacts.
Surface water					
Construction	All systems: Construction impacts on surface flow would be negligible to minor and could be naturally mitigated by standard construction practices. There would be no impacts on off-post surface water.				No impacts since there would be no construction.
Operations	All systems: Impacts on both on-post and off-post surface water would be negligible to low. Estimated sewage discharge of 7.5 million gal/yr would be small compared with surface water flows and would not significantly change flow conditions in the vicinity of the treatment plant. The additional withdrawals at Coldwater Spring would not be significant and would have negligible impacts on the surface water environment downstream of the spring.				No impacts.

TABLE 2.7-1 (Cont.)

Environmental Consequence	Neutralization/ Biotreatment	Neutralization/ Supercritical Water Oxidation	Neutralization/Gas-Phase Chemical Reduction/ Transpiring Wall Supercritical Water Oxidation	Electrochemical Oxidation	No Action
Terrestrial habitats and vegetation					
Construction	All systems: The pilot facility would require approximately 25 acres; however, up to 11 acres might be disturbed as a result of infrastructure additions for Area A, up to 6 acres for Area B, and up to 52 acres for Area C. Biotic communities occurring in undeveloped land in all three areas are relatively common and well represented. Disturbance of communities within existing corridors would be temporary.				No impacts since there would be no construction.
Operations	All systems: During routine operations, biota in the vicinity of the facility would be exposed to emissions from the boiler and the process stack. Emissions would be within applicable standards. Maximum annual average air concentrations of organic compounds due to facility emissions would be considerably lower than levels known to be harmful to biota.				No impacts.
Wildlife					
Construction	All systems: The loss of habitat would not be expected to threaten local populations of any wildlife species since similar habitat would be available nearby.				No impacts since there would be no construction.
Operations	All systems: Deposition from atmospheric emissions would result in very low concentrations of trace metals and organic compounds, well below levels known to be harmful to biota. Consequently, routine operations would result in negligible impacts on wildlife.				No impacts.
Aquatic habitats and fish					
Construction	All systems: Rerouting or culverting the streams in Area A could result in loss of stream habitat. Because of the limited diversity of aquatic habitat and lack of undisturbed habitat in Area A, disturbances could constitute a minor adverse impact. Aquatic habitats do not occur in Areas B or C.				No impacts since there would be no construction.
Operations	All systems: Water withdrawal from surface waters, as well as wastewater discharge, would result in negligible changes to surface water levels. These changes would result in only negligible impacts on aquatic ecosystems. Depositions from atmospheric emissions would result in very low concentrations of trace metals and organic compounds, well below levels known to be harmful to biota.				No impacts.

TABLE 2.7-1 (Cont.)

Environmental Consequence	Neutralization/ Biotreatment	Neutralization/ Supercritical Water Oxidation	Neutralization/Gas-Phase Chemical Reduction/ Transpiring Wall Supercritical Water Oxidation	Electrochemical Oxidation	No Action
Protected species					
Construction	All systems: None of the sites assessed for the pilot facility or the routes for infrastructure corridors are located in the immediate vicinity of populations of Tennessee yellow-eyed grass. Therefore, the direct impact on this species from construction would be negligible. Implementation of storm-water control measures would greatly reduce the potential for indirect impacts.				No impacts since there would be no construction.
Operations	All systems: During routine operations, biota in the vicinity of the pilot facility would be exposed to atmospheric emissions from the boiler stack and the process stack. Facility emissions would be within applicable air quality standards. The maximum annual average concentration of trace metals would be well below levels known to result in adverse impacts on biota through biouptake and biomagnification. Routine operations would not affect Tennessee yellow-eyed grass.				No impacts.
Wetlands					
Construction	All systems: The loss of up to 1.2 acres of palustrine wetland, up to 1,912 ft of riverine wetland, and up to 12 acres of floodplain as a result of construction in Area A would constitute a moderate to large adverse impact. Wetlands do not occur in Areas B or C.				No impacts since there would be no construction.
Operations	All systems: Water withdrawals from surface waters for the pilot plant as well as wastewater discharge would result in negligible changes in surface water levels. These changes would result in only negligible impacts on aquatic ecosystems, including wetlands located on the periphery of the surface water bodies.				No impacts.
Cultural resources					
Construction	All systems: The probability of adverse effects on cultural resources as a result of construction is very small. The potential for archaeological sites is low in most areas of ANAD. Each of the construction areas is a considerable distance from known archeological sites. No traditional cultural properties are known to exist within the proposed construction areas. Only Area A includes an existing structure, which is scheduled for demolition.				No impacts since there would be no construction.
Operations	All systems: Routine operations should have no impact on archaeological resources, traditional cultural properties, or historic structures.				No impacts.

TABLE 2.7-1 (Cont.)

Environmental Consequence	Neutralization/ Biotreatment	Neutralization/ Supercritical Water Oxidation	Neutralization/Gas-Phase Chemical Reduction/ Transpiring Wall Supercritical Water Oxidation	Electrochemical Oxidation	No Action
Socioeconomics					
Construction	All systems: The impact on the ROI would be relatively small. In-migration would have only a marginal effect on population growth. No significant impact on public finances or public service jobs would be expected. On-post employee commuting patterns would have no impact on levels of service in the local transportation network.				No impacts since there would be no construction.
	Increases: Employment: 640 direct jobs 540 indirect jobs Income: $35 million In-migrating population: 640	Increases: Employment: 730 direct jobs 520 indirect jobs Income: $37 million In-migrating population: 890	Increases: Employment: 740 direct jobs 580 indirect jobs Income: $39 million In-migrating population: 970	Increases: Employment: 790 direct jobs 620 indirect jobs Income: $42 million In-migrating population: 1,100	
Operations	All systems: The impact on the ROI would be relatively small.				Negligible impact on the ROI.
	Increases: Employment: 660 direct jobs 580 indirect jobs Income: $46 million In-migrating population: 740	Increases: Employment: 660 direct jobs 580 indirect jobs Income: $46 million In-migrating population: 740	Increases: Employment: 660 direct jobs 590 indirect jobs Income: $46 million In-migrating population: 740	Increases: Employment: 660 direct jobs 820 indirect jobs Income: $53 million In-migrating population: 930	Continued storage produces: Employment: 90 direct jobs 60 indirect jobs Income: $7 million
Environmental justice					
Construction	All systems: The socioeconomic impacts from construction would primarily increase short-term employment and income. They would also increase demand for housing, schools, and public services. None of these impacts would be high or adverse for local governments, and the existing housing stock should be able to meet the demand. Similarly, no high and adverse impacts are anticipated during construction of an ACWA facility. As a result, environmental justice impacts are not anticipated from construction.				No impacts since there would be no construction.

TABLE 2.7-1 (Cont.)

Environmental Consequence	Neutralization/ Biotreatment	Neutralization/ Supercritical Water Oxidation	Neutralization/Gas-Phase Chemical Reduction/ Transpiring Wall Supercritical Water Oxidation	Electrochemical Oxidation	No Action
Operations	All systems: During operations, there would be no high and adverse socioeconomic impacts associated with the facility. In addition, the risk of noncancer health effects and the risk of cancer from hazardous chemicals released during normal operations would be very low for both workers and the public. Neither of these impacts would be considered high and adverse. As a consequence, no environmental justice impacts are anticipated.				No impacts.
Agriculture					
Construction	No impacts are likely as a result of construction.				No impacts since there would be no construction.
Operations	During routine operations, facility emissions would be within applicable air quality standards. A screening-level agricultural risk assessment was conducted. The results indicated negligible risk from maximum concentrations on post and even lower risk off post. There is no evidence of bioaccumulation.				No impacts.

[a] Abbreviations: CDC = Centers for Disease Control and Prevention, CO = carbon monoxide, HAP = hazardous air pollutant, NESHAP = National Emission Standards for Hazardous Air Pollutants, PM_{10} = particulate matter with a mean aerodynamic diameter of 10 micrometers or less, $PM_{2.5}$ = particulate matter with a mean aerodynamic diameter of 2.5 micrometers or less, ROI = region of influence, scf = standard cubic foot (feet).

TABLE 2.7-2 PBA Summary Table[a]

Environmental Consequence	Neutralization/ Supercritical Water Oxidation	Neutralization/Gas-Phase Chemical Reduction/Transpiring Wall Supercritical Water Oxidation	Electrochemical Oxidation	No Action
Land use	All systems: Actions would be consistent with current and planned installation use. Up to 37 acres would be disturbed.			No impacts.
Infrastructure				
Electric power supply	All systems: Additional electric power lines would be required.			No impacts.
	60 GWh/yr would be required.	26 GWh/yr would be required.	120 GWh/yr would be required.	
Natural gas	All systems: Construction of additional gas pipelines required. Natural gas supplier has sufficient capacity to meet current and future demand.			No impacts.
	52 million scf/yr would be required.	140 million scf/yr would be required.	48 million scf/yr would be required.	
Water supply and use				No impacts.
Construction	All systems: Impacts on water supply and sewage treatment systems would be negligible.			
Operations	The ACWA facility would have a negligible impact on water supply systems. Sewage systems have sufficient capacity to meet the additional requirements of an ACWA facility.			
	6 million gal/yr of process water would be required; 5.5 million gal/yr of potable water would be required.	18 million gal/yr of process water would be required; 6.4 million gal of potable water would be required.	900,000 gal/yr of process water would be required; 6.4 million gal/yr of potable water would be required.	
Waste management and facilities				
Construction	All systems: Hazardous and nonhazardous wastes would be generated during construction. All wastes would be collected and disposed of off post in accordance with all applicable regulations. Nonhazardous wastes would be collected and disposed of in a local landfill. Sanitary wastes would be treated in an on-post sewage treatment plant. No significant impacts are expected.			No impacts since there would be no construction.

TABLE 2.7-2 (Cont.)

Environmental Consequence	Neutralization/ Supercritical Water Oxidation	Neutralization/Gas-Phase Chemical Reduction/Transpiring Wall Supercritical Water Oxidation	Electrochemical Oxidation	No Action
Operations	All systems: Hazardous and nonhazardous solid wastes would be generated during the treatment processes. These solid wastes would be collected and disposed of off post at appropriately permitted facilities. Quantities of brine salts produced by all technologies would vary, depending on the agent to be destroyed. Nonprocess solid wastes could be contaminated with agent and would also require treatment. If these treatment residual wastes are defined as RCRA hazardous waste, the estimated volume of hazardous waste would be larger, and additional treatment might be necessary before disposal. Process and nonprocess liquid wastes would be recycled within the treatment process. The only liquid waste associated with ACWA facilities that would be discharged would be domestic sanitary wastewater.			No impacts.
Air quality — criteria pollutants				
Construction	All systems: Concentration increments of criteria air pollutants and fugitive dust emissions would be relatively small fractions of applicable NAAQS. Total estimated annual concentration of $PM_{2.5}$ would be below but close to applicable NAAQS primarily because of high background concentration levels.			No impacts since there would be no construction.
Operations	All systems: Estimated maximum concentration increments due to operation would contribute less than 2% of applicable NAAQS for all pollutants. Except for $PM_{2.5}$, maximum estimated concentrations of criteria pollutants would be less than or equal to 54% of NAAQS. $PM_{2.5}$ would be close to standards but still below them.			No impacts.
Air quality — toxic air pollutants				
Construction	All systems: Impacts would be negligible. Minor emissions would result from construction equipment.			No impacts since there would be no construction.
Operations	All systems: Routine operations: Pilot facility emissions would not be a major source of HAP emissions and would not fall under any of the source categories regulated by the EPA under NESHAP. Fluctuating operations: No agent emissions would be expected. Modeling of worst-case emissions resulted in estimated ambient agent concentrations of less than 1% of the allowable concentrations for general population exposure established by the CDC.			No impacts.

TABLE 2.7-2 (Cont.)

Environmental Consequence	Neutralization/ Supercritical Water Oxidation	Neutralization/Gas-Phase Chemical Reduction/Transpiring Wall Supercritical Water Oxidation	Electrochemical Oxidation	No Action
Human health and safety — routine operations				
Construction	Facility workers: Estimated annual fatalities: <1 Estimated annual injuries: 22	Facility workers: Estimated annual fatalities: <1 Estimated annual injuries: 23	Facility workers: Estimated annual fatalities: <1 Estimated annual injuries: 24	No impacts since there would be no construction.
	All systems: Other on-post workers and residents: There would be no adverse health impacts. Off-post public: There would be no adverse health impacts.			
Operations	Facility workers: Estimated annual fatalities: <1 Estimated annual injuries: 35	Facility workers: Estimated annual fatalities: <1 Estimated annual injuries: 35	Facility workers: Estimated annual fatalities: <1 Estimated annual injuries: 35	Facility workers: Estimated annual fatalities: <1 Estimated annual injuries: 5
	All systems: Other on-post workers and residents: Estimated hazard indices and carcinogenic risks from inhalation of toxic air pollutants are well below benchmarks considered representative of negligible risk levels. No agent emissions are expected. Even under hypothetical worst-case emission levels, the maximum estimated on-post concentration would be less than 1% of the allowable concentration for general public exposures. Off-post public: Estimated hazard indices and carcinogenic risks from inhalation of toxic air pollutants are well below benchmarks considered representative of negligible risk levels. No agent emissions are expected. Even under hypothetical worst-case emission levels, the maximum estimated off-post concentration would be less than 1% of the allowable concentration for general public exposures.			No impacts.

TABLE 2.7-2 (Cont.)

Environmental Consequence	Neutralization/ Supercritical Water Oxidation	Neutralization/Gas-Phase Chemical Reduction/Transpiring Wall Supercritical Water Oxidation	Electrochemical Oxidation	No Action
Noise				
Construction	All systems: Impacts on nearest residents would be negligible. Noise level would be below EPA guidelines for residential zones.			No impacts since there would be no construction.
Operations	All systems: Impacts on nearest residents would be negligible. Noise level would be below EPA guidelines for residential zones.			No impacts.
Visual resources				
Construction	All systems: Temporary impacts would result from increased traffic and construction dust. Impacts would be negligible.			No impacts since there would be no construction.
Operations	All systems: Impacts would be negligible. Facility would not be visible from off post. Steam from the facility might be visible on and off post during cold weather, which would be consistent with the industrial character of the area.			No impacts.
Geology and soils				
Construction	All systems: Approximately 25 acres could be affected to some degree during construction. Additional ground would be disturbed for development of site infrastructure. Best management practices would minimize adverse impacts of potential soil erosion.			No impacts since there would be no construction.
Operations	All systems: Potential impact could occur in the event of an accidental spill or release. Containment actions would be taken to limit migration and contaminated soils would be removed. No significant impact on soils would result from air emissions.			No impacts.
Groundwater				
Construction	All systems: Impacts would be none to negligible and would be short-lived. No contamination of groundwater is expected. Existing water supply wells have the capacity to meet construction demand.			No impacts since there would be no construction.
Operations	All systems: Increase in potable water use would not be significant, and existing wells have capacity to meet additional demand. Increased drawdown would not be permanent. Procedures exist to preclude spills and to address them should they occur.			No impacts.

TABLE 2.7-2 (Cont.)

Environmental Consequence	Neutralization/ Supercritical Water Oxidation	Neutralization/Gas-Phase Chemical Reduction/Transpiring Wall Supercritical Water Oxidation	Electrochemical Oxidation	No Action
Surface water				
Construction	All systems: Construction impacts on surface flow would be negligible to minor and could be naturally mitigated by standard construction practices. During incident-free construction, no contamination of surface water would be expected. Berms should be placed to restrict surface runoff. If spills or leaks would occur, procedures would exist to quickly remove contaminants before they could be transported to existing surface or groundwater resources. There would be no impacts on off-post surface water.			No impacts since there would be no construction.
Operations	All systems: Impacts would be negligible. Estimated sewage discharge would be small compared with surface water flows and would not significantly change flow conditions. There would be no impacts on off-post surface water.			No impacts.
Terrestrial habitats and vegetation				
Construction	All systems: Construction would disturb about 25 acres for the pilot facility plus another 4–12 acres for infrastructure.			No impacts since there would be no construction.
Operations	All systems: Impacts on vegetation would be negligible because levels of air pollutant release would be low. Deposition levels on soil and vegetation downwind of the ACWA facility would be negligible.			No impacts.
Wildlife				
Construction	All systems: The presence of construction crews and traffic would cause some species to avoid areas near construction sites during construction period. Less mobile species would be killed during vegetation clearing. Loss of habitat is not expected to eliminate any wildlife species since similar habitat is relatively common elsewhere on the installation.			No impacts since there would be no construction.
Operations	All systems: Increase in human activity and associated traffic would increase number of roadkills. Wildlife species would not be affected by releases of trace metals and organic compounds because food chain transfer via plants would be minimal. The potential for bioaccumulation is low.			No impacts.
Aquatic habitats and fish				
Construction	All systems: No impacts would be likely because erosion control measures would be used to control runoff during construction of the ACWA facility and infrastructure.			No impacts since there would be no construction.

TABLE 2.7-2 (Cont.)

Environmental Consequence	Neutralization/ Supercritical Water Oxidation	Neutralization/Gas-Phase Chemical Reduction/Transpiring Wall Supercritical Water Oxidation	Electrochemical Oxidation	No Action
Operations	All systems: No impacts would be likely because emission rates of all trace constituents and particulates are expected to be at levels well below those that would affect ecosystems through biouptake or biomagnification in the food chain.			No impacts.
Protected species				
Construction	All systems: No impacts on protected species are anticipated. No federal endangered or threatened species are known to exist at PBA.			No impacts since there would be no construction.
Operations	All systems: There would be no impacts because no federal endangered or threatened species are known to exist at PBA.			No impacts.
Wetlands				
Construction	All systems: Construction at Area A could potentially eliminate the small palustrine wetlands on the southwest margin of the installation. Grading for preparation of Area B could disturb wetlands and alter drainage patterns within the installation. Construction on Area B could eliminate two wetlands located on the installation.			No impacts since there would be no construction.
Operations	All systems: Deposition from atmospheric emissions would result in very low concentrations of trace metals and organic compounds, well below levels known to be harmful to biota. The impact on wetlands would be negligible.			No impacts.
Cultural resources				
Construction	All systems: There would be small probability for adverse effects. Area A has not been surveyed, but there is considerable disturbance and waste disposal within the area. The potential for finding intact cultural deposits is low. Areas B and C were surveyed, and no cultural sites were recorded. No traditional cultural properties and no standing structures are located in any of the areas.			No impacts since there would be no construction.
Operations	All systems: There are no cultural resources in the area, so there should be no impacts.			No impacts.
Socioeconomics				
Construction	All systems: Impact on ROI would be relatively small. In-migration would have only a marginal effect on population growth. No significant impact on public finances or public service jobs would be expected. On-post employee commuting patterns would have no impact on levels of service in the local transportation network.			No impacts since there would be no construction.

TABLE 2.7-2 (Cont.)

Environmental Consequence	Neutralization/ Supercritical Water Oxidation	Neutralization/Gas-Phase Chemical Reduction/Transpiring Wall Supercritical Water Oxidation	Electrochemical Oxidation	No Action
Construction (Cont.)	Increases: Employment: 730 direct jobs 570 indirect jobs Income: $40 million In-migrating population: 210	Increases: Employment: 740 direct jobs 610 indirect jobs Income: $42 million In-migrating population: 220	Increases: Employment: 780 direct jobs 660 indirect jobs Income: $45 million In-migrating population: 250	
Operations	All systems: Impacts on the ROI would be relatively small.			Negligible impacts on the ROI. Continued storage produces: Employment: 100 direct jobs 80 indirect jobs Income: $8 million
	Increases: Employment: 720 direct jobs 760 indirect jobs Income: $53 million In-migrating population: 580	Increases: Employment: 720 direct jobs 760 indirect jobs Income: $53 million In-migrating population: 580	Increases: Employment: 720 direct jobs 850 indirect jobs Income: $56 million In-migrating population: 640	
Environmental justice				
Construction	All systems: The socioeconomic impacts from construction would primarily increase short-term employment and income. They would also increase demand for housing, schools, and public services. None of these impacts would be high or adverse for local governments, and the existing housing stock would likely meet the demand. Similarly, no high and adverse impacts are anticipated during construction of an ACWA facility. As a result, environmental justice impacts are not anticipated from construction.			No impacts since there would be no construction.
Operations	All systems: During operations, there would be no high and adverse socioeconomic impacts associated with the facility. In addition, the risk of noncancer health effects and the risk of cancer from hazardous chemicals released during normal operations would be very low for both workers and the public. Neither of these impacts would be considered high and adverse. As a consequence, no environmental justice impacts are anticipated.			No impacts.

TABLE 2.7-2 (Cont.)

Environmental Consequence	Neutralization/ Supercritical Water Oxidation	Neutralization/Gas-Phase Chemical Reduction/Transpiring Wall Supercritical Water Oxidation	Electrochemical Oxidation	No Action
Agriculture				
Construction	No impacts would be likely from construction.			No impacts since there would be no construction.
Operations	Facility emissions would be within applicable air quality standards. A screening-level agricultural risk assessment indicated that the risks from maximum concentrations of emissions from operations would be negligible.			No impacts.

[a] Abbreviations: CDC = Centers for Disease Control and Prevention, CO = carbon monoxide, HAP = hazardous air pollutant, NESHAP = National Emission Standards for Hazardous Air Pollutants, PM_{10} = particulate matter with a mean aerodynamic diameter of 10 micrometers or less, $PM_{2.5}$ = particulate matter with a mean aerodynamic diameter of 2.5 micrometers or less, ROI = region of influence, scf = standard cubic foot (feet).

TABLE 2.7-3 PCD Summary Table[a]

Environmental Consequence	Neutralization/ Biotreatment	Neutralization/ Supercritical Water Oxidation	No Action
Land use	Both systems: There would be no impacts. Construction would be within the industrial area. The maximum area disturbed for the facility and associated infrastructure would be 85 acres. Land use would be consistent with the reuse plan.		No impacts.
Infrastructure			
Electric power supply			
Construction	Both systems: Power lines and substations would be required. Supply would be adequate to meet increased demand. There would be no impacts.		No impacts.
Operations	36 GWh/yr would be required.	60 GWh/yr would be required.	No impacts.
Natural gas supply	New gas pipeline would be required. Supply would be adequate to meet increased demand. 94 million scf/yr would be required.	149 million scf/yr would be required.	No impacts.
Water supply and use			
Construction	Both systems: New water pipelines required. Supply would be adequate to meet increased demand of 8.6 acre-ft/yr. Additional water rights would need to be purchased. There would be no impact.		No impacts since there would be no construction.
Operations	Both systems: Additional water rights would need to be purchased. Supply is adequate to meet demand. Existing sewage lagoons might need to be expanded.		No impacts.
	Supply would be adequate to meet increased demand of 13 million gal/yr of process water[b] and 6.4 million gal/yr of potable water.	Supply would be adequate to meet increased demand of 18 million gal/yr of process water[b] and 6.4 million gal/yr potable water.	
Waste management and facilities			
Construction	Both systems: Existing waste management facilities would be adequate to handle hazardous solid wastes. No significant impacts would result from the generation of hazardous and nonhazardous wastes during construction.		No impacts since there would be no construction.

TABLE 2.7-3 (Cont.)

Environmental Consequence	Neutralization/ Biotreatment	Neutralization/ Supercritical Water Oxidation	No Action
Operations	Both systems: Hazardous and nonhazardous solid wastes would be generated during the treatment processes. These solid wastes would be collected and disposed of off post at appropriately permitted facilities. Quantities of brine salts produced by all technologies would vary, depending on the agent to be destroyed. Nonprocess solid wastes could be contaminated with agent and would also require treatment. Chemical weapons are RCRA listed wastes in Colorado; therefore, all treatment residues are also listed wastes and, if not delisted under RCRA, must be managed and disposed of as hazardous waste. Process and nonprocess liquid wastes would be recycled within the treatment process. The only liquid waste associated with ACWA facilities that would be discharged would be domestic sanitary wastewater.		Waste would be generated from occasional leaks. Facilities and procedures would be adequate to handle leaks.
Air quality — criteria pollutants			
Construction	Both systems: Emissions would include fugitive dust from earth-moving activities and exhaust from equipment and vehicles. Concentration increments would be relatively small fractions of applicable NAAQS. Overall ambient air quality would be good. Impacts would be minor.		No impacts since there would be no construction.
Operations	Both systems: Concentration increases due to operation would contribute approximately 2% of NAAQS/SAAQS. Overall ambient air quality would be good. Impacts would be negligible.		Stockpile maintenance activities would generate very small emissions from boilers and vehicular traffic in the area of Munitions Storage Area A. Impact would be negligible.
Air quality — toxic air pollutants			
Construction	Both systems: Impacts would be negligible. Minor emissions would result from construction equipment.		No impacts since there would be no construction.
Operations	Both systems: Normal: Pilot facility would not be a major source of HAP emissions and would not fall under any of the source categories regulated by the EPA under NESHAP. Fluctuating: No agent emissions would be expected. Modeling of worst-case emissions resulted in estimated ambient agent concentrations of less than 1% of the allowable concentrations for general population exposure.		No impacts.

TABLE 2.7-3 (Cont.)

Environmental Consequence	Neutralization/ Biotreatment	Neutralization/ Supercritical Water Oxidation	No Action
Human health and safety — routine operations			
Construction	Facility workers: Estimated annual fatalities: <1 Estimated annual injuries: 17	Facility workers: Estimated annual fatalities: <1 Estimated annual injuries: 21	No impacts since there would be no construction.
	Both systems: Other on-post workers and residents: There would be no adverse health impacts. Off-post public: There would be no adverse health impacts.		
Operations	Both systems: Facility workers: Estimated annual fatalities: <1 Estimated annual injuries: 30		Facility workers: Estimated annual fatalities: <1 Estimated annual injuries: 4
	On-post workers and residents: Estimated hazard indices and carcinogenic risks from inhalation of toxic air pollutants are well below benchmarks considered representative of negligible risk levels. No agent emissions are expected. Even under hypothetical worst-case emission levels, the maximum estimated on-post concentration would be less than 1% of the allowable concentration for general public exposures. The maximum estimated incremental cancer risk from the inhalation of hypothetical mustard emissions is well below the benchmark risk value.		No impacts.
	Off-post public: Estimated hazard indices and carcinogenic risks from inhalation of toxic air pollutants are well below benchmarks considered representative of negligible risk levels. No agent emissions are expected. Even under hypothetical worst-case emission levels, the maximum estimated off-post concentration would be less than 1% of the allowable concentration for general public exposures. The maximum estimated incremental cancer risk from the inhalation of hypothetical mustard emissions is well below the benchmark risk value.		No impacts.
Noise			
Construction	Both systems: Noise levels would be within local/state limits. Potential noise impacts are expected to be comparable to background levels at the nearest residence. Impacts would be negligible.		No impacts since there would be no construction.

TABLE 2.7-3 (Cont.)

Environmental Consequence	Neutralization/ Biotreatment	Neutralization/ Supercritical Water Oxidation	No Action
Operations	Both systems: Estimated noise level at the nearest residence from the proposed facility (less than 35 dBA) would be within residential noise standards (55 dBA). Impacts would be negligible.		Noise generated by stockpile maintenance would be part of background and within legal limits.
Visual resources			
Construction	Both systems: Some decrease in visibility would result from dust emissions. Impacts would be small, intermittent, and temporary.		No impacts since there would be no construction.
Operations	Both systems: ACWA facility would be consistent with surrounding landscape. Operations would not create significant, visible emissions. There would be no impacts.		No impacts.
Geology and soils			
Construction	Both systems: As many as 85 acres of soil could be affected from construction of pilot facilities and associated infrastructure. Best management practices for soil erosion would mitigate potential adverse impacts.		No impacts since there would be no construction.
Operations	Both systems: No contamination of soils would be expected. Facilities are designed to contain small accidental releases. There would be no impacts.		Potential impacts would be limited primarily to leaks of petroleum-based products from vehicles. Impacts would be negligible.
Groundwater			
Construction	Both systems: Water use would be relatively small compared with historical use. Impacts would be negligible.		No impacts since there would be no construction.
Operations	Both systems: Water use would be relatively small compared with historical use. Facilities are designed to contain small accidental releases. Impacts from water withdrawals would be negligible.		No impacts.

TABLE 2.7-3 (Cont.)

Environmental Consequence	Neutralization/ Biotreatment	Neutralization/ Supercritical Water Oxidation	No Action
Surface water			
Construction	Both systems: Construction impacts on surface flow would be negligible to minor and could be naturally mitigated by standard construction practices. No contamination of surface water would be expected. Facilities are designed to contain small accidental releases.		No impacts since there would be no construction.
Operations	Both systems: No contamination of surface water would be expected. Facilities are designed to contain small accidental releases. There would be no impacts.		No impacts.
Terrestrial habitats and vegetation			
Construction	Both systems: As much as 85 acres of vegetative and terrestrial habitats could be disturbed. Most disturbances would be short-term and would be mitigated through revegetation. Small amount of permanent loss would occur. Negligible impacts.		No impacts since there would be no construction.
Operations	Both systems: Metals and organic compounds in emissions would be deposited on the ground in very low concentrations and would not adversely affect terrestrial biota. No impacts.		No impacts.
Wildlife			
Construction	Both systems: Less mobile burrowing species could be killed during construction and site preparation. Some losses would occur because of roadkills. Noise, human activity, and habitat loss would have no impact on the continued survival of the species because of the abundance of similar habitat next to proposed construction areas.		No impacts since there would be no construction.
Operations	Both systems: Noise, human activity, and habitat loss would have little impact because of the abundance of similar habitat next to proposed facility sites. Annual emission rates of all trace constituents and particulates would be well below levels affecting ecosystems through biomagnification or biouptake. There would be no impacts.		No impacts.
Aquatic habitats and fish			
Construction	Both systems: No aquatic resources in the areas be would affected by construction. There would be no impacts.		No impacts since there would be no construction.

TABLE 2.7-3 (Cont.)

Environmental Consequence	Neutralization/ Biotreatment	Neutralization/ Supercritical Water Oxidation	No Action
Operations	Both systems: Concentrations of organic compounds and trace metals would not be at levels that would adversely affect aquatic ecosystems downwind. There would be no impacts.		No impacts.
Protected species			
Construction	Both systems: The loggerhead shrike, a federal sensitive species, could be affected by loss of habitat.		No impacts since there would be no construction.
Operations	Both systems: No impacts on endangered, threatened, or candidate species would result from normal operations.		No impacts.
Wetlands			
Construction	Both systems: No wetlands are near the proposed construction areas. There would be no impacts.		No impacts since there would be no construction.
Operations	Both systems: Concentrations of organic compounds and trace metals would not be at levels that would adversely affect downwind wetlands. There would be no impacts.		No impacts.
Cultural resources			
Construction	Both systems: No known cultural resources are located within the construction area. Unexpected discoveries of cultural resources during earth-moving activities would be evaluated in coordination with regulators. Impacts are unlikely.		No impacts since there would be no construction.
Operations	Both systems: There are no known cultural resources. There would be no impacts.		No impacts.
Socioeconomics			
Construction	Both systems: Impacts on the ROI would be relatively small. In-migration would have only a marginal effect on population growth. No significant impact on public finances or public service jobs is expected. On-post employee commuting patterns would have no impact on levels of service in the local transportation network.		No impacts since there would be no construction.

TABLE 2.7-3 (Cont.)

Environmental Consequence	Neutralization/ Biotreatment	Neutralization/ Supercritical Water Oxidation	No Action
Construction (Cont.)	Increases Employment: 600 direct jobs 570 indirect jobs Income: $36 million In-migrating population: 1,140	Increases Employment: 680 direct jobs 540 indirect jobs Income: $37 million In-migrating population: 1,200	
Operations	Both systems: Impact on the ROI would be relatively small.		Negligible impact on the ROI.
	Increases: Employment: 640 direct jobs 530 indirect jobs Income: $44 million In-migrating population: 750	Increases: Employment: 640 direct jobs 580 indirect jobs Income: $45 million In-migrating population: 790	Continued storage produces: Employment: 80 direct jobs 60 indirect jobs Income: $6 million
Environmental justice			
Construction	Both systems: The socioeconomic impacts from construction would primarily increase short-term employment and income. They would also increase demand for housing, schools, and public services. None of these impacts would be high or adverse for local governments, and the existing housing stock would likely meet the demand. Similarly, no high and adverse impacts are anticipated during construction of an ACWA facility. As a result, environmental justice impacts are not anticipated from construction.		No impacts since there would be no construction.
Operations	Both systems: During operations, there would be no high and adverse socioeconomic impacts associated with the facility. In addition, the risk of noncancer health effects and the risk of cancer from hazardous chemicals released during normal operations would be very low for both workers and the public. Neither of these impacts would be considered high and adverse. As a consequence, no environmental justice impacts are anticipated.		No impacts.

TABLE 2.7-3 (Cont.)

Environmental Consequence	Neutralization/ Biotreatment	Neutralization/ Supercritical Water Oxidation	No Action
Agriculture			
Construction	Both systems: No impacts on agriculture would be likely from facility construction.		No impacts since there would be no construction.
Operations	Both systems: Facility emissions would be within applicable air quality standards during routine operations. A screening- level agricultural risk assessment indicated that risks from maximum concentrations would be negligible.		No impacts.

[a] Abbreviations: CDC = Centers for Disease Control and Prevention, CO = carbon monoxide, HAP = hazardous air pollutant, NESHAP = National Emission Standards for Hazardous Air Pollutants, PM_{10} = particulate matter with a mean aerodynamic diameter of 10 micrometers or less, $PM_{2.5}$ = particulate matter with a mean aerodynamic diameter of 2.5 micrometers or less, ROI = region of influence, scf = standard cubic foot (feet).

[b] The numbers used in the analysis were from demonstration testing. Subsequent engineering design studies now indicate 5.7 million gal/yr of process water for Neut/Bio and 1.3 million gal/yr for Neut/SCWO.

TABLE 2.7-4 BGAD Summary Table[a]

Environmental Consequence	Neutralization/ Biotreatment	Neutralization/ Supercritical Water Oxidation	Neutralization/Gas-Phase Chemical Reduction/Transpiring Wall Supercritical Water Oxidation	Electrochemical Oxidation	No Action
Land use	All systems: Actions would be consistent with current and planned installation use. Construction could disturb up to 95 acres for the facility and supporting infrastructure. Development of Proposed Area A may interfere with other site activities.				No impacts.
Infrastructure					
Electric power supply	All systems: Temporary lines or generators would be required for construction. A new line and substation would be needed for operation. Supply would be adequate to meet increased demand.				No impacts.
	2 GWh/yr would be required.	60 GWh/yr would be required.	26 GWh/yr would be required.	122 GWh/yr would be required.	
Natural gas	All systems: Extension of gas pipelines and a new metering station would be required. Supply would be adequate to meet increased demand.				No impacts.
	9 million scf/yr would be required.	52 million scf/yr would be required.	138 million scf/yr would be required.	52 million scf/yr would be required.	
Water supply and use	All systems: Extension of water supply pipelines would be required. Supply would be adequate to meet increased demand. A new storage tank would be required for emergency response. A new wastewater treatment plant would be required.				No impacts.
	1.3 million gal/yr of process water would be required; 300,000 gal/yr of potable water would be required.	6.3 million gal/yr of process water would be required; 6.4 million gal/yr of potable water would be required.	18 million gal/yr of process water would be required; 6.4 million gal/yr of potable water would be required.	1 million gal/yr of process water would be required; 6.4 million gal/yr of potable water would be required.	
Waste management and facilities					
Construction	All systems: Construction wastes could be treated by existing systems. No additional impacts from managing these wastes are anticipated.				No impacts since there would be no construction.

TABLE 2.7-4 (Cont.)

Environmental Consequence	Neutralization/ Biotreatment	Neutralization/ Supercritical Water Oxidation	Neutralization/Gas-Phase Chemical Reduction/Transpiring Wall Supercritical Water Oxidation	Electrochemical Oxidation	No Action
Operations	All systems: Hazardous and nonhazardous solid wastes would be generated during the treatment processes. These solid wastes would be collected and disposed of off post at appropriately permitted facilities. Quantities of brine salts produced by all technologies would vary, depending on the agent to be destroyed. Nonprocess solid wastes could be contaminated with agent and would also require treatment. Chemical weapons are RCRA listed wastes in Kentucky; therefore, all treatment residues are also listed wastes and, if not delisted under RCRA, must be managed and disposed of as hazardous waste. Process and nonprocess liquid wastes would be recycled within the treatment process. The only liquid waste associated with ACWA facilities that would be discharged would be domestic sanitary wastewater.				No impacts.
Air quality — criteria pollutants					
Construction	All systems: Total concentrations of criteria air pollutants resulting from fugitive dust emissions would be below applicable NAAQS, except for $PM_{2.5}$. Statewide background levels of $PM_{2.5}$ are above the annual NAAQS without the addition of an ACWA pilot facility; consequently, the total estimated annual average concentrations of $PM_{2.5}$ would be above the applicable NAAQS.				No impacts.
Operations	All systems: Estimated maximum concentration of criteria air pollutants would be within applicable standards, except for $PM_{2.5}$, for routine and fluctuating operations. Total estimated annual average concentrations of $PM_{2.5}$ would be above the applicable NAAQS, primarily because of high background concentration levels.				Background levels of $PM_{2.5}$ exceed NAAQS.
Air quality — toxic air pollutants					
Construction	All systems: Impacts would be negligible. Minor emissions would result from construction equipment.				No impacts since there would be no construction.
Operations	All systems: Routine: Pilot facility emissions would not be a major source of HAP emissions and would not fall under any of the source categories regulated by the EPA under NESHAP. Fluctuating: No agent emissions would be expected. Modeling of worst-case emissions resulted in estimated ambient agent concentrations of less than 1% of the allowable concentrations for general population exposure established by the CDC.				No impacts.

TABLE 2.7-4 (Cont.)

Environmental Consequence	Neutralization/ Biotreatment	Neutralization/ Supercritical Water Oxidation	Neutralization/Gas-Phase Chemical Reduction/Transpiring Wall Supercritical Water Oxidation	Electrochemical Oxidation	No Action
Human health and safety — routine operations					
Construction	Facility workers: Estimated annual fatalities: <1 Estimated annual injuries: 17	Facility workers: Estimated annual fatalities: <1 Estimated annual injuries: 22	Facility workers: Estimated annual fatalities: <1 Estimated annual injuries: 22	Facility workers: Estimated annual fatalities: <1 Estimated annual injuries: 24	No impacts since there would be no construction.
	All systems: Other on-post workers and residents: Potential for adverse health impacts from inhalation of $PM_{2.5}$ in existing environment already exists. There would be no other impacts. Off-post public: Potential for adverse health impacts from inhalation of $PM_{2.5}$ in existing environment already exists. There would be no other impacts.				
Operations	Facility workers: Estimated annual fatalities: <1 Estimated annual injuries: 35	Facility workers: Estimated annual fatalities: <1 Estimated annual injuries: 35	Facility workers: Estimated annual fatalities: <1 Estimated annual injuries: 35	Facility workers: Estimated annual fatalities: <1 Estimated annual injuries: 35	Facility workers: Estimated annual fatalities: <1 Estimated annual injuries: 3
	All systems: On-post workers and residents: Estimated hazard indices and carcinogenic risks from inhalation of toxic air pollutants are well below benchmarks considered representative of negligible risk levels. No agent emissions are expected. Even under hypothetical worst-case emission levels, the maximum estimated on-post concentration would be less than 1% of the allowable concentration for general public exposures. The maximum estimated incremental cancer risk from the inhalation of hypothetical mustard emissions is well below the benchmark risk value. Potential for adverse health impacts from inhalation of $PM_{2.5}$ in existing environment already exists. Off-post public: Estimated hazard indices and carcinogenic risks from inhalation of toxic air pollutants are well below benchmarks considered representative of negligible risk levels. No agent emissions are expected. Even under hypothetical worst-case emission levels, the maximum estimated on-post concentration would be less than 1% of the allowable concentration for general public exposures. The maximum estimated incremental cancer risk from the inhalation of hypothetical mustard emissions is well below the benchmark risk value. Potential for adverse health impacts from inhalation of $PM_{2.5}$ in existing environment already exists.				Potential for adverse health impacts from inhalation of $PM_{2.5}$ in existing environment already exists.

TABLE 2.7-4 (Cont.)

Environmental Consequence	Neutralization/ Biotreatment	Neutralization/ Supercritical Water Oxidation	Neutralization/Gas-Phase Chemical Reduction/Transpiring Wall Supercritical Water Oxidation	Electrochemical Oxidation	No Action
Noise					
Construction	All systems: Impacts on nearest residents would be negligible. Noise level would be below EPA guidelines for residential zone.				No impacts since there would be no construction
Operations	All systems: Impacts on nearest residents would be negligible. Noise level would be well below EPA guidelines for residential zone.				No impacts.
Visual resources					
Construction	All systems: Temporary impacts would result from increased traffic and construction dust.				No impacts since there would be no construction.
Operations	All systems: There would be no impacts. Industrial character of the facility and possible presence of small steam plume would be consistent with the visual character of the surrounding area and depot.				No impacts.
Geology and soils					
Construction	All systems: Impacts would be negligible. Up to 95 acres would be disturbed by construction of pilot facilities and associated infrastructure. Best management practices for soil erosion would minimize adverse impacts.				No impacts since there would be no construction.
Operations	All systems: There would be no impacts. No contamination of soils would be expected. The facility would be designed to prevent migration of small accidental releases (spills or leaks).				No impacts. Procedures are in place to prevent migration of small accidental releases (spills or leaks) while ACWs are in storage.

TABLE 2.7-4 (Cont.)

Environmental Consequence	Neutralization/ Biotreatment	Neutralization/ Supercritical Water Oxidation	Neutralization/Gas-Phase Chemical Reduction/Transpiring Wall Supercritical Water Oxidation	Electrochemical Oxidation	No Action
Groundwater					
Construction	All systems: There would be no impacts. The use of best management practices for erosion control would restrict surface runoff. Existing procedures dictate that spills or leaks of contaminants be quickly removed so they will not be transported to groundwater resources.				No impacts since there would be no construction.
Operations	All systems: Impacts would be negligible. There would be a slight increase in groundwater flow because of releases from the domestic sewage treatment plant.				No adverse impact from continued storage.
Surface water					
Construction	All systems: Construction impacts on surface flow would be negligible to minor and could be naturally mitigated by standard construction practices. Existing procedures dictate that spills or leaks of contaminants be quickly removed so they will not be transported to surface waters. Impacts on water supply would be negligible.				No impacts since there would be no construction.
Operations	All systems: There would be no impacts. The facility would be designed to prevent migration of small accidental releases (spills or leaks). Impacts on water supply would be negligible.				No impacts.
Terrestrial habitats and vegetation					
Construction	All systems: Impacts would be negligible. Up to 95 acres of vegetation and terrestrial habitat could be disturbed. Much of the disturbance would be temporary and mitigated through revegetation. Best management practices for soil erosion would minimize adverse impacts.				No impacts since there would be no construction.
Operations	All systems: Impacts would be negligible. The facility would be designed to prevent migration of small accidental releases (spills or leaks). Air emissions would be low and would not affect vegetation. Concentrations and deposition of emission constituents would pose no ecological risk.				No impacts.

TABLE 2.7-4 (Cont.)

Environmental Consequence	Neutralization/ Biotreatment	Neutralization/ Supercritical Water Oxidation	Neutralization/Gas-Phase Chemical Reduction/Transpiring Wall Supercritical Water Oxidation	Electrochemical Oxidation	No Action
Wildlife					
Construction	All systems: Impacts would be negligible. Noise, human activity, and habitat loss would have little impact because nearby habitats are similar. Less mobile species could be killed during construction and site preparation. Mitigation measures would be implemented to avoid impacts from erosion, use of construction vehicles, and siting of transmission lines.				No impacts since there would be no construction.
Operations	All systems: Impacts would be negligible. Noise, human activity, and habitat loss would have little impact because nearby habitats are similar. Releases of trace metals and organic compounds would be well below threshold levels for ecosystems. Deposition from atmospheric emissions would result in very low concentrations of trace metals and organic compounds. Deposition was shown to pose no ecological risk to terrestrial habitats.				No impacts.
Aquatic habitats and fish					
Construction	All systems: Impacts would be unlikely. Potential impacts due to soil erosion or sedimentation would be avoided through mitigation.				No impacts since there would be no construction.
Operations	All systems: There would be no impacts. No effluents would be released to streams because all process liquids would be recycled.				No impacts.
Protected species					
Construction	All systems: Construction of a transmission line could affect the running buffalo clover, a federal listed endangered species, through direct disturbance or loss of individual plants. Mitigation measures have been developed to minimize adverse effects.				No impacts since there would be no construction.
Operations	All systems: There would be no impacts.				No impacts.
Wetlands					
Construction	All systems: No wetlands would be directly affected within proposed Area A. Proposed Area B contains three small wetlands that could be adversely affected. Mitigation measures have been developed to minimize adverse effects.				No impacts since there would be no construction.

TABLE 2.7-4 (Cont.)

Environmental Consequence	Neutralization/ Biotreatment	Neutralization/ Supercritical Water Oxidation	Neutralization/Gas-Phase Chemical Reduction/Transpiring Wall Supercritical Water Oxidation	Electrochemical Oxidation	No Action
Operations	All systems: There would be no impacts.				No impacts.
Cultural resources					
Construction	Several archaeological sites are known to occur near the project area. Surveys would be required before ground disturbance could begin. Additional sites could be identified. Mitigation would be required if important archaeological sites were to be adversely affected by construction. No impacts are expected on previously surveyed portion of Proposed Area A.				No impacts since there would be no construction.
Operations	All systems: There would be no impacts.				No impacts.
Socioeconomics					
Construction	All systems: Impacts on the ROI would be relatively small. In-migration would have only a marginal impact on population growth. No significant impact on public finances or public service jobs would be expected. On-post employee commuting patterns would have no impact on levels of service in the local transportation network.				No impacts since there would be no construction.
	Increases: Employment: 570 direct jobs 530 indirect jobs Income: $35 million In-migrating population: 310	Increases: Employment: 670 direct jobs 510 indirect jobs Income: $37 million In-migrating population: 490	Increases: Employment: 710 direct jobs 550 indirect jobs Income: $39 million In-migrating population: 570	Increases: Employment: 800 direct jobs 610 indirect jobs Income: $44 In-migrating population: 740	

TABLE 2.7-4 (Cont.)

Environmental Consequence	Neutralization/ Biotreatment	Neutralization/ Supercritical Water Oxidation	Neutralization/Gas-Phase Chemical Reduction/Transpiring Wall Supercritical Water Oxidation	Electrochemical Oxidation	No Action
Operations	All systems: Impacts on the ROI would be relatively small.				Negligible impact on the ROI.
	Increases: Employment: 720 direct jobs 570 indirect jobs Income: $49 million In-migrating population: 680	Increases: Employment: 720 direct jobs 610 indirect jobs Income: $51 million In-migrating population: 720	Increases: Employment: 720 direct jobs 560 indirect jobs Income: $49 million In-migrating population: 680	Increases: Employment: 720 direct jobs 600 indirect jobs Income: $50 million In-migrating population: 710	Continued storage produces: Employment: 50 direct jobs 40 indirect jobs Income: $4 million
Environmental justice					
Construction	All systems: The socioeconomic impacts from construction would primarily increase short-term employment and income. They would also increase demand for housing, schools, and public services. None of these impacts would be high or adverse for local governments, and the existing housing stock would likely meet the demand. Similarly, no high and adverse impacts are anticipated during construction of an ACWA facility. As a result, environmental justice impacts are not anticipated from construction.				No impacts since there would be no construction.
Operations	All systems: During operations, there would be no high and adverse socioeconomic impacts associated with the facility. In addition, the risk of noncancer health effects and the risk of cancer from hazardous chemicals released during normal operations would be very low for both workers and the public. Neither of these impacts would be considered high and adverse. As a consequence, no environmental justice impacts are anticipated.				No impacts.

TABLE 2.7-4 (Cont.)

Environmental Consequence	Neutralization/ Biotreatment	Neutralization/ Supercritical Water Oxidation	Neutralization/Gas-Phase Chemical Reduction/Transpiring Wall Supercritical Water Oxidation	Electrochemical Oxidation	No Action
Agriculture					
Construction	All systems: Impacts on agriculture from facility construction would not be likely.				No impact since there would be no construction.
Operations	During normal operations, facility emissions would be within applicable air quality standards. A screening-level agricultural risk assessment was conducted. The analysis indicated that the risks from maximum concentrations would be negligible.				No impact.

[a] Abbreviations: CDC = Centers for Disease Control and Prevention, CO = carbon monoxide, HAP = hazardous air pollutant, NESHAP = National Emission Standards for Hazardous Air Pollutants, PM_{10} = particulate matter with a mean aerodynamic diameter of 10 micrometers or less, $PM_{2.5}$ = particulate matter with a mean aerodynamic diameter of 2.5 micrometers or less, ROI = region of influence, scf = standard cubic foot (feet).