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5.7 WORKER SAFETY AND HEALTH

Hydrogen Energy International LLC (HEI or Applicant) is jointly owned by BP Alternative Energy North America Inc., and Rio Tinto Hydrogen Energy LLC. HEI is proposing to build an Integrated Gasification Combined Cycle (IGCC) power generating facility called Hydrogen Energy California (HECA or the "Project") in Kern County, California. The Project will produce electricity while substantially reducing greenhouse gas emissions by capturing carbon dioxide (CO_2) and transporting it for enhanced oil recovery (EOR) and sequestration.

The 315-acre Project Site is located approximately 6.5 miles west of the outermost edge of the city of Bakersfield and 2 miles northwest of the unincorporated community of Tupman in western Kern County, California, as shown in Figure 2-1, Project Vicinity Map. The Project Site is adjacent to an oil producing area known as the Elk Hills Oil Field Unit. The Project Site is currently undeveloped. Existing surface elevations vary from about 445 feet above mean sea level (msl) in the southwest corner to about 310 feet above msl in the northeast corner.

The Project will gasify petroleum coke (or blends of petroleum coke and coal, as needed) to produce hydrogen to fuel a combustion turbine operating in combined cycle mode. The gasification component feeds a 390 gross megawatt (MW) combined cycle plant. The net electrical generation output from the Project will provide California with approximately 250 MW of low-carbon baseload power to the grid. The gasification component will also capture approximately 90 percent of the carbon dioxide from the syngas at steady-state operation, which will be transported and used for EOR and sequestration (storage) in the Elk Hills Oil Field Unit. In addition, approximately 100 MW of natural gas generated peaking power will be available from the Project.

The Project Site and linear facilities comprise the affected study area and are entirely located in Kern County, California. These Project components are described below.

Major on-site Project components will include, as shown on Figure 2-4, Plot Plan:

- Solids Handling, Gasification, and Gas Treatment
  - Feedstock delivery, handling and storage
  - Gasification
  - Sour shift/gas cooling
  - Mercury removal
  - Acid gas removal
- Power Generation
  - Combined-cycle power generation
  - Auxiliary combustion turbine generator
  - Electrical switching facilities
- Supporting Process Systems
  - Natural gas fuel systems

- Air separation unit (ASU)
- Sulfur recovery unit
- Zero liquid discharge
- Carbon dioxide compression
- Wastewater injection wells
- Raw water treatment plant
- Other plant systems

The Project also includes the following off-site facilities, as shown on Figure 2-5, Project Location Map:

- **Electrical Transmission Line** – An electrical transmission line will interconnect the Project to Pacific Gas & Electric's (PG&E) Midway Substation. The interconnection voltage is expected to be 230 kilovolts (kV). The Project is considering two alternative transmission routes, both of which extend from the western edge of the Project Site to the north, and west to the north side of the substation. Transmission Alternative 1 is approximately 9 miles long and Transmission Alternative 2 is approximately 9.5 miles long.
- **Natural Gas Supply** – A natural gas interconnection will be made with either PG&E or Southern California Gas Company natural gas pipelines, both of which are located southeast of the Project Site. The natural gas pipeline will be approximately 7 miles in length. The interconnect will consist of one tap off the existing natural gas line, one meter set, one service pipeline service connection, and a pressure limiting station located on the Project Site.
- **Water Supply Pipelines** – The Project will utilize brackish groundwater supplied from the Buena Vista Water Storage District (BVWSD) located to the northwest. The raw water supply pipeline will be approximately 18 miles in length. Potable water for drinking and sanitary use will be supplied by West Kern Water District located near the State Route 119 (SR 119)/Tupman Road intersection (southeast of the Project Site). The potable water supply pipeline will be approximately 5.5 miles in length.
- **Carbon Dioxide Pipeline** – The carbon dioxide pipeline will transfer the carbon dioxide captured during gasification from the Project Site southwest to the custody transfer point. The Project is considering two alternative pipeline routes. Alternative 1 is approximately 2 miles in length, while Alternative 2 is approximately 2.5 miles in length.

The Project components described above are shown on Figure 2-5, Project Location Map, which depicts the region, the vicinity, the Project Site and its immediate surroundings for Project components.

This section addresses safety and health issues and describes or outlines systems and procedures that will be developed and implemented to provide occupational safety and health protection for the Project workers. These systems and procedures will be designed to comply with applicable worker health and safety laws, ordinances, regulations, and standards (LORS), including those established by Title 8 California Code of Regulations (CCR), General Industry Safety Orders (GISO), Construction Safety Orders (CSO), and Electrical Safety Orders (ESO), with special attention paid to § 3203, Injury and Illness Prevention Program.

5.7.1 Affected Environment

The Project includes the construction and operation of the primary gasification and power plant facilities, as well as ancillary facilities, such as access roads, linears, and the switchyard. Maps depicting the physical plant layout are presented in Figure 2-4, Plot Plan.

5.7.2 Environmental Consequences

Occupational Health and Safety

Construction, operation, and maintenance activities may expose workers to the hazards identified in Table 5.7-1, Potential Worker Hazards During Facility Construction and Operation. Exposure to these hazards will be minimized through adherence to appropriate engineering design criteria and administrative controls, use of appropriate personal protective equipment (PPE), and compliance with applicable health and safety LORS as described in this section. The programs, regulations, and preventative measures intended to control potential worker health and safety impacts associated with these hazards are described in the remainder of this section.

Table 5.7-1
Potential Worker Hazards During
Facility Construction and Operation

Activity	Potential Hazard
Facility Construction	
All	Heat stress, slips/trip/falls, insects, small biting animals, poison plants, severe weather, earthquake
Materials Handling	Slips/trips/falls, musculoskeletal injury, crushing hazards, load hazards
Elevated Work	Slips/trips/falls
Welding	Flash burns, explosion, thermal burns, toxic welding fumes
Excavations	Excavation/trench wall collapse, spoil movement, oxygen deficiency, buildup of toxic gases, fumes, vapors, dusts or mists, wet exposures, crushing hazards, confined spaces, potentially contaminated soil/waste
Cement/Forms Work	Slips/trips/falls, protruding objects, caustics, punctures, and lacerations
Equipment Operation	Noise, vehicle accidents, load hazards, induced current
Transmission Lines/ Transformer Station	Slips/trips/falls, electrocution, flash burns
Painting	Paint solvents, paint vapors, chemical burns, fire/explosion, slips/trips/falls
Abrasive Blasting	Dust, flying particles, pressure vessels, noise
Powered Hand Tools	Noise, dust, flying particles, cuts, amputation, crushing
Fueling	Fire, explosion, environmental contamination
Facility Operations	
Materials Handling	Slips/trips/falls, musculoskeletal injury, crushing hazards, load hazards
Generation Enclosure	High voltage
Operations Building	High voltage, repetitive trauma
Cooling Unit	Slips/trips/falls, noise, wet exposure, chemical exposure
Transformer	Electrocution, flash burns
Gas Compressor	Fire, noise, temperature, rotating equipment, pressure
Compressed Gas Storage	Fire, explosion
Chemical Storage	Chemical splashes, burns, reactions, gases, vapors, fumes

Table 5.7-1
Potential Worker Hazards During
Facility Construction and Operation

Activity	Potential Hazard
Machinery, General	Noise, temperature extremes, rotating equipment, pinch points, electrocution
Equipment Operation	Noise, vehicle accidents, load hazards, induced current

Source: HECA Project

Construction Health and Safety Program

To protect the health and safety of workers during construction of the Project, the construction contractor will implement a Construction Health and Safety Program consistent with County of Kern requirements and all applicable federal, state, and local health and safety standards. As a result of the implementation of the Construction Health and Safety Program and the other construction protection programs described below, potential impacts to worker health and safety during construction will be less than significant.

Construction Injury and Illness Prevention Program

The Construction Health and Safety Program will meet the California Occupational Safety and Health Administration (Cal/OSHA) Injury and Illness Prevention (IIP) Program requirements. The IIP Program will include requirements for:

- A written Code of Safe Practices for construction activities.
- Identification of the person or persons responsible for implementing the program.
- Posting the Code of Safe Practices at a conspicuous location at each job site office or providing it to each supervisor who will have it readily available.
- A system for identifying workplace hazards, including inspections.
- A system for ensuring employee and subcontractor compliance with the IIP Program.
- Conducting "toolbox" or "tailgate" meetings to discuss job hazards and controls.
- Methods of communicating with employees that encourage employees to identify and report unsafe activities and conditions.
- Procedures for correcting unsafe conditions and activities.
- Training of employees who are newly employed on the project. Training will address the hazards and safety precautions that apply to the work in question. Employees will be directed to read the Code of Safe Practices. When employees are to work near known job site hazards, they will be instructed in the recognition of the hazard, the procedures for protecting themselves from injury, and the first aid procedures in the event of an injury.

Construction Written Health and Safety Programs

Written safety programs will be implemented in conjunction with the Code of Safe Practices. These may include:

- Accident, Incident, and Near-Miss Reporting Procedures

- Bloodborne Pathogens Exposure Control Program
- Compressed Gas and Air Handling System Procedures
- Confined Space Entry Procedures
- Contractor Safety Program
- Electrical Safety Procedures
- Emergency Action Plan and Emergency Response Procedures
- Excavation, Trenching, and Shoring Procedures
- Fall Protection Program
- Hand Tools and Equipment Guarding Safety Procedures
- Hazard Communication Plan, including California's "Proposition 65" requirements
- Hazardous Materials Handling Procedures
- Hazardous Waste Handling Procedures and Awareness Training
- Hearing Conservation Program
- Heat Stress/Cold Stress Prevention
- Heavy Equipment Procedures
- Hoist/Chain/Wire Rope/Webs/Slings/Crane Procedures
- Hot Work Procedures (welding, cutting, and brazing)
- Industrial Hygiene Program
- Industrial Truck (Forklift) Procedures
- Ladder, Scaffold, and Work Platform Procedures
- Lockout/Tagout Procedures
- Motor Vehicle Safety Procedures
- Musculoskeletal Disorder Prevention Program (ergonomics, lifting)
- New Employee Orientation and Training
- Personal Protective Equipment Program
- Portable Electric and Pneumatic Tool Procedures
- Respiratory Protection Program
- Safety and Housekeeping Inspection Program
- Safety Committee and Toolbox/Tailgate Safety Meetings
- Security Program
- Signs, Tags, and Barricade Procedures

- Slip, Trip, and Fall Prevention Program
- Subcontractor safety management policy
- Tool (Power-Operated) Procedures

Construction Safety Training Program

Table 5.7-2, Employee and Contractor Training Programs, outlines the basic types of information and training that employees and contractors of the Project will receive prior to the start of work and throughout construction. The Project Site construction contactor will incorporate these programs and training sessions into their Construction Health and Safety Plans. The Contractor Health and Safety Manager and Client Health and Safety Manager will strive for an alignment of their health, safety, and environmental cultures (i.e., priorities, commitment to implementation of policies and procedures, etc.).

Table 5.7-2
Employee and Contractor Training Programs

Training Course	Project Phase	Target Employees
Site Safety Orientation	C, O, and M	All
Injury and Illness Prevention Plan	C, O, and M	All
Project Emergency Action Plan	C, O, and M	All
Heavy Equipment Safety Plan	C, O, and M	Employees working on or near heavy equipment
Compressed Gas and Pressurized Systems Safety	C, O, and M	Employees working with or near compressed gas or pressurized systems
Thermal Stress (Heat/Cold)	C, O, and M	All
Forklift Operation	C, O, and M	Employees operating forklifts and working in close proximity to forklifts
Trenching and Excavation Safety/Use of Cal/OSHA Excavation Permits	C, O, and M	Employees involved in trenching and excavation activities
100% Fall Protection Program	C, O, and M	Employees required to wear fall protection.
Hot Work	C, O, and M	Employees who may be required to perform hot work
Flammable and Combustible Liquids/Gases	C, O, and M	Employees who will handle flammable or combustible material
Scaffold Safety Program	C, O, and M	Employees who erect scaffolding
Hoisting and Rigging Safety Program	C, O, and M	Employees who conduct or oversee hoisting or rigging operations
Platform Lift Safety	C, O, and M	Employees who operate aerial platform or scissor lift
National Commission for the Certification of Crane Operators (CCO)	C, O, and M	Employees who operate small and large telescoping cranes
Hazardous Energy Control	C, O, and M	Employees performing lockout/tagout
Electrical Safety	C, O, and M	Employees who work on or in close proximity to live electrical systems
Confined Space Entry Permit Program	C, O, and M	Employees who perform or supervise confined space work

Table 5.7-2
Employee and Contractor Training Programs

Training Course	Project Phase	Target Employees
Hand and Power Tool Safety	C, O, and M	All
Housekeeping Policy and Program	C, O, and M	All
Hearing Conservation	C, O, and M	All
Safe Lifting	C, O, and M	All
Vehicle Safety	C, O, and M	All
Hazard Communication	C, O, and M	All
First Line Break	C, O, and M	Employees involved with maintenance or line breaking activities
Personal Protective Equipment (PPE) and Respiratory Protection Program	C, O, and M	Employees who are required to wear PPE and/or respiratory protective equipment
Fire Prevention Program	C, O, and M	All
Fire Protection Program	C, O, and M	All
Process Safety Information and Management Procedures	O, and M	All
Process Hazard Analysis	O, and M	All
Equipment Integrity	O, and M	All
Change Management	O, and M	All
Employee Participation	O, and M	All

Source: HECA Project
Notes:
% = percent
C = Construction
Cal/OSHA = California Occupational Safety & Health Administration
M = Maintenance
O = Operations

Construction Personal Protective Equipment Program

Employees must use the required PPE during construction. Required PPE will be approved for use by the construction safety manager. PPE will be distinctly marked to facilitate identification and will be used only in accordance with the manufacturer's instructions. The construction safety manager will ensure that the PPE will be of such design, fit, and durability as to provide adequate protection against the hazards for which it is designed. The type of PPE required for each job task will be described in the job safety analysis for that task, which will be provided to employees as appropriate. The use of PPE required for Project Site activities includes, but is not limited to, the items specified in Table 5.7-3, Basic Protective Equipment Guide, and will comply with Cal/OSHA requirements. All protective insulating PPE will comply with the Electrical Safety Codes.

Table 5.7-3
Basic Protective Equipment Guide

Body Area	Hazards	Recommended Protection
Eyes/Face	Low-velocity flying particles	Safety glasses with side shields
	High-velocity chips and sparks	Impact goggles or safety glasses with full face shield
	Corrosive liquid splash during transfer	Splash proof goggles and face shield
	Breaking into an acid storage system	Acid hood
	Welding - injurious light rays	Welding hood with appropriate eye filter lenses
Head/Ears	General wear, overhead rigging, material handling, maintenance, and general construction processes	Hard hat
	High noise level	Ear plugs or muff
Respiratory System	Low-hazard inert dusts	Dust mask
	Low concentration solvent vapors	Cartridge-type organic vapor respirator
	Acid mists	Cartridge-type acid mist respirator
	High-concentration dusts or vapors	Air-line respirator
	Oxygen deficiencies or gases	Self-contained breathing apparatus
Hands and Arms	Handling rough or sharp objects	Leather gloves
	Handling hot objects	Insulated gloves
	Using solvents or other hazardous chemicals	Impervious synthetic gloves
Feet and Legs	General wear for light handling	Safety-toe shoes
	Handling heavy objects	Metatarsal safety shoes
	Using brush hooks or scythes	Shin guards
	Working with corrosive liquids	Safety-toe boots
	Underground work	Safety-toe synthetic boots
Trunk and Full Body	Hot or corrosive liquids	Synthetic apron
	Struck-by	High-visibility vest
	Punctures, impact, or cuts	Canvas or leather kickback apron or metal mesh apron
	Breaking acid containers	Full body suit made of appropriate materials
Fall Protection/Rescue	Working from elevated structure or platform without standard railings	Full-body harness and lanyard
	Vessel entry	Harness and lifeline or wristlets and lifeline
	Suspended scaffolds	Lifeline, full-body harness/lanyard

Source: HECA Project

A Respiratory Protection Program will be implemented in compliance with Title 8 of the California Code of Regulations, § 5144, and GISO requirements. The program will include respirator training, fit testing, monitoring, selection, and other necessary provisions. The work atmosphere will be tested/sampled under the Program in order to determine the need for respiratory protection and the effectiveness of controls.

Construction Fire Protection and Prevention Plan

The Project will rely on both on-site fire protection systems and local fire protection services. A Fire Protection and Prevention Plan will be developed consistent with County of Kern requirements and other applicable LORS. The plan will be followed throughout all phases of construction. The specified firefighting equipment and training will be provided to Project Site personnel.

During construction, the permanent facility fire protection system will be placed in service as early as practicable. An interim fire protection system will be in place during construction until the permanent system is completed. The fire protection systems for the Project Site are described in Section 2.9.12, Plant Auxiliaries. Construction fire regulations in 8 CCR, § 1620 *et seq*. will be followed as necessary to prevent construction fires. Applicable local fire requirements include but are not limited to:

- Most recent edition of California Fire Code and all applicable National Fire Protection Association (NFPA) standards (24 CCR Part 9)
- Uniform Fire Code (UFC) Standards
- California Building Code (CBC) Title 24, CCR (24 CCR § 3, *et seq*.)

The local responding fire officials will be given information on the Project Site hazards and the location of these hazards, and the information will be included in the emergency response plans. Special attention will be paid to operations involving open flames, such as welding and use of flammable materials. Personnel involved in such operations will be given appropriate training. A fire watch utilizing appropriately classed extinguishers or other equipment will be maintained during hot work operations. However, Project Site personnel will not be expected to fight fires past the incipient stage.

Materials brought on site must conform to contract requirements, particularly regarding flame resistance or fireproof characteristics. Specific materials in this category include fuels, paints, solvents, plastic materials, lumber, paper, boxes, and crating materials. Specific attention will be given to compressed gas, fuel, solvent, and paint storage. Electrical wiring and equipment located in inside storage rooms used for Class I liquids will be in accordance with applicable regulations. Outside storage areas will be graded to divert (possible) spills away from buildings and will be kept clear of vegetation and other combustible materials. Precautions will be taken to protect storage areas against tampering where necessary.

On-site fire prevention during construction will consist of portable and fixed firefighting equipment. Portable firefighting equipment will consist of fire extinguishers and small hose lines in conformance with Cal/OSHA and the NFPA for potential types of fire associated with construction activities. Project Site personnel will be trained in on-site fire prevention and response as part of the Fire Protection and Prevention Plan. Periodic fire prevention inspections will be conducted by the contractor's safety representative.

The Fire Protection and Prevention Plan will ensure that fire extinguishers will be inspected routinely and replaced immediately if defective or in need of recharge. All firefighting equipment will be conspicuously located and marked with unobstructed access. A water supply of sufficient volume, duration, and pressure to operate the required firefighting equipment will be provided on site. Designated, approved storage areas and containers for flammable materials will be used with adequate fire control services.

Plant Operational Safety Program

The locations of potential worker hazards during the operational phase are listed in Table 5.7-4, Location of Potential Worker Hazards at the Project (Operational Phase). Programs that address, mitigate, and avoid these potential hazards to worker safety will include:

- Regular employee education and training in safe work practices for general and particular task areas as summarized in Table 5.7-2.
- Communication to Project Site workers of hazards in accordance with federal and state standards
- Accident, incident and near-miss evaluations
- Administrative safety procedures
- Emergency response
- Fire prevention and fire response
- Security
- Maintenance of safety performance data

All operations personnel will be provided with written safety guidance. All construction safety programs and procedures that apply to facility operations will be incorporated into the operational safety program for the plant. With the implementation of the protection programs described below, impacts to worker health and safety during operations will be less than significant.

Operations Injury Illness Prevention Program

The primary mitigation measures for worker hazards during operation will be contained in the IIP Program, which is required by 8 CCR, § 3203. The written IIP Program will ensure implementation of the following:

- Identity of the person(s) with authority and responsibility for implementing the program.
- A system for ensuring that employees comply with safe and healthy work practices.
- A system for communicating with employees in a readily understandable form.
- Procedures for identifying and evaluating workplace hazards including inspections to identify hazards and unsafe conditions.
- Methods for correcting unhealthy/unsafe conditions in a timely manner.
- Methods of documenting inspections and training and maintaining records for 3 years.
- A training program for:
  - Establishing the program initially
  - New, transferred, or promoted employees
  - New processes and equipment
  - Supervisors

Table 5.7-4
Location of Potential Worker Hazards at the
HECA Project (Operational Phase)

Location	Acid[1]	Flammable Material	Hazardous Material	High Voltage	Noise[2]	Pressure Vessel	Pressurized Gas Cylinders	Rotating Equipment	High Temperature
Control Room	X			X					
Maintenance Shop/Warehouse		X	X		X		X	X	
Process and Power Blocks	X	X	X	X	X	X	X	X	X
Switchyards			X	X					
Stacks							X		

Source: HECA Project
Notes:
[1]Acid: Areas containing acids (sulfuric acid in batteries or sulfuric acid and hydrochloric acid for pH control).
[2]Noise: Area requiring noise protection.

The IIP Program will designate a safety representative who is responsible for implementing the program. It will also describe safety training for new employees and procedures for tracking safety training. The IIP Program will provide a job safety analysis (JSA) for each job. The JSA will identify safety hazards related to each work task and establish procedures for avoiding, correcting, reporting, and notifying employees of these hazards.

Operational Written Safety Programs

The IIP Program will be used in conjunction with other written safety programs to help safeguard worker health and safety. These programs may include the following:

- Accident, Incident, and Near-Miss Reporting Procedures
- Bloodborne Pathogens Exposure Control Program
- Chemical Hygiene Plan for laboratory chemical use
- Code of Safe Practices for Equipment and Operation
- Compressed Gas and Air Handling Systems
- Confined Space Entry Procedures
- Electrical Safety Procedures
- Emergency Action Plan
- Emergency Response Procedures
- Fall Protection Program
- Fire Protection and Prevention Plan
- Hand Tools and Equipment Guarding Safety Procedures
- Hazard Communication Plan, including California's "Proposition 65" requirements
- Hazardous Materials Handling Procedures
- Hazardous Waste Handling Procedures and Awareness Training
- Hearing Conservation Program
- Heat Stress/Cold Stress Prevention
- Heavy Equipment Procedures
- Hoist/Chain/Wire Rope/Webs/Rope Slings/Cranes Procedures
- Hot Work Program (welding, cutting, and brazing)
- Industrial Hygiene Program
- Industrial Truck (Forklifts) Procedures
- Ladders, Scaffolds, and Work Platform Procedures
- Lockout/Tagout Procedures

- Motor Vehicle Safety Procedures
- Musculoskeletal Disorder Prevention Program (ergonomics, lifting)
- New Employee Orientation and Training
- Personal Protective Equipment Program
- Portable Electric and Pneumatic Tool Procedures
- Respiratory Protection Program
- Safety and Housekeeping Inspection Program
- Safety Committee and Toolbox/Tailgate Safety Meetings
- Security Program
- Stop Work Authority
- Signs, Tags, and Barricades
- Slips, Trips, and Falls Prevention Program
- Subcontractor Safety Management Policy
- Tools (Power-Operated) Procedures
- Process Safety Information and Management Procedures

These programs will be reviewed annually to determine if they are affected by any new regulations and to determine the effectiveness of their implementation. Other written programs or plans may relate to worker safety in that they enable work to be performed in a safe manner. These include standard operating procedures, worker qualifications programs, and Project Site security.

Operations Safety Training Programs

All Project workers will be given instructions regarding their responsibility for safe conduct of their work at the time the employee is first hired and as an ongoing training program of hazard recognition and avoidance. Table 5.7-2, Employee and Contractor Training Programs, outlines the basic types of information and training required for employees and contractors of the project during operations and maintenance (O&M).

In accordance with the Hazard Communication policy, workers will be instructed in the safety regulations pertinent to their employment tasks. Information and training on safe working conditions, work practices, and protective equipment requirements will be communicated in the following manner:

- New, promoted, or transferred employees will receive safety training orientation.
- Weekly safety meetings will be held with employees.
- Toolbox/tailgate safety meetings will be conducted periodically for each crew. General safety topics and specific hazards that may be encountered will be discussed. Comments and suggestions from all employees will be encouraged and shared.

- Regularly scheduled health and safety meetings will be held for supervisors.
- Hazard communication training, including California's "Proposition 65" warnings and discharge prohibitions, will be conducted for each new hazardous material that is introduced to the workplace.
- Material Safety Data Sheets (MSDS) will be provided for all appropriate chemicals.
- A bulletin board with required postings and other information will be maintained at the Project Site.
- Warning signs will be posted in hazardous areas.

In accordance with the Hazard Communication policy, safety training will be provided to each new employee as described below:

- A list of safe work rules for the Project will be explained to each new employee.
- A copy of the applicable Safe Work Practices will be given to each new employee.
- The Hazard Communication Program and other applicable training and requirements for personal protection for the types of hazards that may be encountered at the Project Site will be explained to employees. This training will be documented.
- Unusual hazards that are found on site will be explained in detail to each new employee, including any specific requirements for personal protection.
- Safety requirements for the new employee's specific job assignment will be explained by the foreman upon initial assignment and upon any reassignment.

Operations Personal Protective Equipment Program

In accordance with the Operations Personal Protective Equipment program, personal protective clothing and equipment will be used during specified work operations. Each employee will be provided the following information pertaining to the protective clothing and equipment:

- Proper use and maintenance
- When the protective clothing and equipment are to be used
- Benefits and limitations
- When and how the protective clothing and equipment are to be replaced

Each employee will be checked for proper fit and to see if they are medically capable of wearing the equipment.

All safety equipment will meet National Institute of Occupational Safety and Health (NIOSH) or American National Standards Institute (ANSI) standards and will have all required markings, numbers, or certificates of approval. Table 5.7-3, Basic Protective Equipment Guide, contains a list of the basic protective equipment that will be used at the Project Site.

Hazardous Materials Handling and Storage

Various hazardous materials will be stored and used during construction and operation of the Project. The storage, handling, and use of all chemicals will follow applicable LORS to minimize risks to workers. All hazardous materials will be appropriately labeled and stored in hazardous materials storage facilities, as described in more detail in Section 5.12, Hazardous Materials.

Bulk hazardous materials will be stored in aboveground storage tanks. Other hazardous materials will be stored in their delivery containers. Hazardous materials storage and chemical feed areas will be surrounded by containment or curbing to contain leaks and spills. The containment areas will be sized to hold an appropriate volume (considering the potential for the local hazard contingencies) as designated by a California registered Professional Engineer. At a minimum, this volume will equal the full contents of the largest single tank plus sufficient capacity for precipitation from a 25-year, 24-hour storm event in the case of outdoor storage tanks.

A risk management plan (RMP) will be developed for the storage and use of any of the substances, as defined in § 112(r) of the Clean Air Act, in excess of their specific regulatory threshold calls for specific CalARP and/or RMP program requirements to be fulfilled. The RMP will detail specific safety requirements, procedures, and training to protect workers from exposure.

Safety showers and eyewash stations will be provided in or adjacent to corrosive chemical storage areas and in required areas in accordance with regulatory requirements. The PPE and spill response equipment for the exposure and cleanup will be readily available for plant personnel for use during spill containment and cleanup activities. A hazardous material emergency response team, trained in the handling of these emergencies and accidental releases of hazardous materials, will be available to the project through contracted services. Emergency contact numbers will be available for spill response contractors and for notification of local agencies of spill incidents. These and other procedures will be detailed in the Project Emergency Action Plan.

Operations Emergency Action Plan/Emergency Response Plan

In addition to the incorporation of various safety and environmental features and design measures to minimize emergencies and their effects on public and worker safety, the Project will develop a site-specific Emergency Action Plan/Emergency Response Plan. A typical plan outline is provided in Table 5.7-5, Sample Emergency Action/Emergency Response Plan Outline. This plan will be designed to address potential emergencies, including hazardous materials releases, fires, bomb threats, pressure vessel ruptures, and other catastrophic events. It will describe evacuation routes, warning devices, points of contact, assembly areas, responsibilities, and other actions to be taken in the event of an emergency. The plan will include a layout map and a fire extinguisher list, and describe arrangements with local emergency response agencies for responding to emergencies. The plan will be reviewed and updated regularly by the operations safety manager.

Table 5.7-5
Sample Emergency Action/
Emergency Response Plan Outline

Section Number	Description
1.0	**Introduction**
1.1	Purpose
1.2	Scope
2.0	**Responsibilities**
2.1	Incident Command System
	Emergency Response Coordinator
	Emergency Evacuation Coordinator
	Alternate
	Safety Coordinator
2.2	Position Description Assignments
	Construction/Facility Manager
	Construction/Facility Supervisor
	Operators
	Health and Safety Manager
	Security
3.0	**Response and Notification Plan (Points of Contact)**
3.1	Supervisor/Emergency Coordinator
3.2	Health and Safety Manager
4.0	**Response Procedures**
4.1	Evacuation Routes and Procedures
4.2	Accidents Involving Serious Injury and/or Death
4.3	Fire
4.4	Hazardous Waste or Chemical Spills
4.5	Earthquake
4.6	Bomb Threat
4.7	Emergency Plant Shutdown and Critical Operations
4.8	Site Security
4.9	Emergency Medical Treatment and First Aid
4.10	Decontamination
4.11	Documentation and Recordkeeping
4.12	News Media
4.13	Emergency Notification List
4.14	Emergency Telephone Numbers List
5.0	**Reference Procedures**
5.1	Evacuation Plan
5.2	Emergency Equipment Locations
5.3	Fire Extinguisher Locations
5.4	Security
5.5	Accident Reporting and Investigation
5.6	Lockout/Tagout
5.7	Hazard Communication
5.8	Spill Containment and Reporting

Table 5.7-5
Sample Emergency Action/
Emergency Response Plan Outline

Section Number	Description
5.9	First Aid and Medical Response
5.10	Respiratory Protection
5.11	Personal Protective Equipment (PPE)
5.12	Sanitation
5.13	Work Site Inspections

Source: HECA Project

Operations Fire Protection and Prevention Plan

In accordance with the Operations Fire Protection and Prevention Plan, fire protection at the Project Site will include measures to safeguard human life, prevent personnel injury, preserve property, and minimize downtime due to fire or explosion. It will address sprinkler systems, water supplies, fire extinguishers, adequate exits, fire-safe construction, reduction of ignition sources, and control of fuel sources.

The Fire Protection and Prevention Plan will provide for fire protection practices including routine inspections of the Project Site by the designated safety representative. The plan will require prompt action to correct situations deemed to be a fire hazard and it will identify firefighting equipment and systems at the Project Site as well as methods to safely store flammable and combustible materials. Facilities will be designed by a California Registered Fire Protection Engineer, and fire protection equipment will be installed and maintained in accordance with all applicable NFPA standards and recommendations. A fire reporting protocol (depending on the size of the fire) and an investigation protocol will be detailed in the Fire Protection and Prevention Plan. The plan will be reviewed and updated regularly.

The comprehensive on-site fire protection system and procedures will be designed and implemented to protect both personnel and property. A Program Fire Protection and Prevention Plan will be developed to address:

- Names and/or job titles responsible for maintaining equipment and accumulation of flammable or combustible material control
- Procedures in the event of fire, including evacuation procedures
- Fire alarm and protection equipment
- System and equipment maintenance
- Monthly inspections
- Annual inspections
- Firefighting demonstrations
- Housekeeping practices
- Training

Fire Suppression

The following fire suppression systems will be incorporated into the Fire Protection and Prevention Plan if needed to ensure proper protection from fire hazards:

- Carbon Dioxide Fire Protection System. This system protects the combustion turbines and accessory equipment compartments from fire. The system will have fire detection sensors in all compartments.
- Aqueous Film Forming Foams (AFFF). This system will be used for fire protection at the methanol tanks.
- Deluge Spray System. This system provides fire protection to the generator transformers, auxiliary power transformer, and lube-oil equipment in the event of fire. The deluge system will be fed by the firewater storage and supply system.
- Fire Hydrants/Hose Stations. This system will supplement the plant fire protection system. Water will be supplied from the plant firewater system. These will be located at approximately 300-foot intervals around the facility in accordance with NFPA 850 and local fire codes.
- Sprinkler System. This system will provide protection to the administration and maintenance buildings.
- Smoke Detectors, Combustible Gas Detectors, and Fire Extinguishers. These will be provided at all locations having potential fire hazards due to the presence of combustible liquids, solids, or other highly flammable materials, and where major property damage could result. Extinguishers will be strategically located at code-approved intervals throughout the facility and selected for the appropriate class of service.

Water will be used as the primary extinguishing agent. Chemical and gas extinguishing agents (permanently installed or in portable extinguishers) will be provided in special hazard areas where water will be ineffective or harmful to the equipment being protected.

The project on-site fire suppression systems will be backed up by fire suppression support from the Kern County Fire Department. Both fire and emergency services will be provided from Kern County Fire Department Station 26 and other Kern County resources as needed. Firewater will be supplied from the firewater distribution system as described in Section 2.9.9, Fire Protection System.

5.7.3 Mitigation Measures

With the implementation of the health and safety protection programs described above, the Project would not result in any significant environmental impacts to worker health or safety during construction or operations. As a result, no mitigation measures for worker health or safety are necessary.

5.7.4 Laws, Ordinances, Regulations, and Standards

The following LORS are applicable or potentially applicable to the project in the context of the public and occupational safety and health protection measures addressed in this section and in Section 5.6, Public Health. LORS applicable to worker safety are summarized in Table 5.7-6, Summary of LORS – Worker Safety.

Table 5.7-6
Summary of LORS – Worker Safety

LORS	Applicability	Conformance (Section)
Federal		
Occupational Health & Safety Act of 1970 (OSHA), 29 USC 651 *et seq*.; 29 CFR 1910 *et seq*.; and 29 CFR 1926 *et seq*.	Employee health and safety standards for general industry and the construction industry	5.7
Department of Labor, Safety and Health Regulations for Construction Promulgated Under §333 of the Contract Work Hours and Safety Standards Act, 40 USC 327 *et seq.*	Employee health and safety standards for construction activities; requirements addressed by CCR Title 8, General Construction Safety Orders	5.7
National Fire Protection Association	Standards necessary to establish a reasonable level of safety and property protection from the hazards created by fire and explosion	5.7
State		
CCR, Title 8	Requirements for a safe and hazard-free working environment; categories of requirements include General Industry Safety Orders, General Construction Safety Orders, Electrical Safety Orders	5.7
California Clean Air Act, California Health & Safety Code 39650 *et seq*.	Requirements for best available control technology to minimize exposure limits to toxic air pollutants and possible risk assessments for carcinogen pollutants	5.1 and 5.6
California Public Resources §25523(a); 20 CCR §1752, 1752.5, 2300.2309, and Division 2, Chapter 5, Article 1, Appendix B, Part (I), CEC California Health and Safety Code §25500 to 25541; 19 CCR §§2720-2734	Requirements for estimating emissions for listed air toxic pollutants and submitting inventory to air district for major sources of criteria air pollutants; follow-up from air district may require a health risk assessment	5.1 and 5.6
Local		
Kern County Zoning Ordinance, Title 19 of the Kern County Ordinance Code	Provide required setbacks	5.11
Kern County Environmental Health Services Department	Oversees administration of state hazardous materials programs including Hazardous Materials Business Plans and Risk Management Plans	5.7.4

Source: HECA Project
Notes:
CCR = California Code of Regulations
CEC = California Energy Commission
CFR = Code of Federal Regulations
LORS = laws, ordinances, regulations, and standards
USC = United States Code

Federal

Occupational Safety and Health Act of 1970 (Occupational Safety & Health Administration), 29 United States Code §651 *et seq.;* 29 Code of Federal Regulations §§1910 *et seq.;* and 29 Code of Federal Regulations §1926 *et seq.*

The authority establishes occupational safety and health standards (§1910) [i.e., permissible exposure limits for toxic air contaminants (§1910.100), electrical protective equipment requirements (§1910.137), electrical workers safety standards (§1910.269), and the requirement that information concerning the hazards associated with the use of all chemicals is transmitted from employers to employees (§1910.1200)] and safety and health regulations for construction (§1926). Subpart I of §1910 and Subpart E of §1926 address PPE.

Under the Operational Status Agreement of 5 October 1989 between the federal OSHA and the California Department of Industrial Relations, Division of Occupational Safety and Health (DOSH), the state resumed full enforcement responsibility for most of the relevant federal standards and regulations, (55 Federal Reg. 18610 [12 July 1990]; 29 CFR §1952.172). Federal OSHA has retained concurrent enforcement jurisdiction with respect to certain federal standards including standards relating to hazardous materials at 29 CFR §1910.120 (Id.).

The administering agencies for the above authority are OSHA and DOSH (Cal/OSHA).

Department of Labor, Safety and Health Regulations for Construction Promulgated Under §333 of the Contract Work Hours and Safety Standards Act, 40 United States Code 327 *et seq.*

The code establishes safety and health regulations for construction. The requirements for this regulation are all addressed in Title 8 CCR, Chapter 4, Subchapter 4, General Construction Safety Orders.

The administering agencies for the above authority are OSHA and DOSH (Cal/OSHA).

Uniform Fire Code, Article 80

The article includes provisions for storage and handling of hazardous materials. Considerable overlap exists between this code and Chapter 6.95 of the Health and Safety Code. However, the fire code does contain independent provisions regarding fire protection and neutralization systems for emergency venting (§80.303, D, Compressed Gases). Other articles that may be applicable include Article 4, Permits, and Article 79, Flammable and Combustible Liquids.

The administering agency for the above authority is the Kern County Fire Prevention Division.

National Fire Protection Association

The NFPA prescribes minimum requirements necessary to establish a reasonable level of fire safety and property protection from the hazards created by fire and explosion. The standards apply to the manufacture, testing, and maintenance of the equipment.

The administering agency for the above authority is the Kern County Fire Prevention Division.

Compliance

The HECA Project will comply with all federal LORS by developing appropriate plans and policies as well as by measures described in Section 5.7.2, Environmental Consequences, and Section 5.7.4, Mitigation Measures.

State

Title 8 California Code of Regulations

These authorities prescribe general occupational safety and health regulations and standards in addition to the construction and industrial safety regulations, standards, and orders. The HECA Project will comply with applicable sections of 8 CCR, Chapter 4, Subchapter 7 and 24 CCR. Specifically, 8 CCR §1509 (Construction) and §3203 (General Industry) include requirements for ensuring that employers have an effective work site IIP Program. The CCR, Title 8, § 5189, requires facility owners to develop and implement effective Safety Management Plans to ensure that large quantities of hazardous materials are handled safely. Although such requirements primarily provide for the protection of workers, they also indirectly improve public safety and are coordinated with the RMP process.

California Health and Safety Code, Section 25500

This code requires companies that handle hazardous materials in sufficient quantities to develop a Hazardous Materials Business Plan (HMBP). The HMBP includes the basic information on the location, type, quantity, and health risks of hazardous materials handled, stored, used, or disposed of that could be accidentally released into the environment. It also includes a plan for training new personnel, and for annual training of all personnel in safety procedures to follow in the event of a release of hazardous materials. It also includes an emergency response plan and identifies the business representative able to assist emergency personnel in the event of a release.

The California Health and Safety Code, § 25531, directs facility owners storing or handling acutely hazardous materials in reportable quantities to develop an RMP and submit it to appropriate local authorities, the United States Environmental Protection Agency (USEPA), and the designated local administering agency for review and approval. The RMP includes an evaluation of the potential impacts associated with an accidental release, the likelihood of an accidental release occurring, the magnitude of potential human exposure, any pre-existing evaluations or studies of the material, the likelihood of the substance being handled in the manner indicated, and the accident history of the material. This new, recently developed program supersedes the California Risk Management and Prevention Plan and is known as the California Accidental Release Program. The HECA Project will develop and submit an RMP prior to initial operation.

Compliance

The Project will comply with all state LORS by developing appropriate plans and policies as well as by measures described in Section 5.7.2, Environmental Consequences, and Section 5.7.4, Mitigation Measures.

Local

The Kern County Environmental Health Services Department is responsible for the implementation of the HMBP and RMP.

Compliance

The Project will comply with all local LORS and will develop an HMBP for construction and operation of the new facility, and will develop an RMP for operation of the new facility. In

addition, the project will continue compliance by updating the appropriate plans and policies as well as by the measures described in Section 5.7.2, Environmental Consequences, and Section 5.7.4, Mitigation Measures.

5.7.5 Involved Agencies and Agency Contacts

Agencies with jurisdiction to issue applicable permits and/or enforce LORS related to worker safety are shown in Table 5.7-7, Agency Contacts.

Table 5.7-7
Agency Contacts

Agency/Address	Telephone	Title
California Occupational Safety & Health Administration District Office 6150 Van Nuys Boulevard, Suite 405 Van Nuys, CA 91401	818-901-5403 818-901-5578 (fax)	Trenching and Excavation Permit Permit to erect fixed tower crane Erection and dismantle scaffolds, false work, or vertical shoring systems Site Construction Safety Plans Injury and Illness Prevention Program
Kern County Environmental Health Services Department - Hazardous Materials Management Specialist	661-862-8700	Hazardous Materials Business Plans and Risk Management Plans
Kern County Fire Department – Station 26 Buttonwillow	661-764-5225	Construction Fire Protection and Prevention Plan Operational Fire Protection and Prevention Plan

Source: HECA Project

5.7.6 Permits Required and Permit Schedule

The permits required for this project are listed in Table 5.7-8, Applicable Permits. An HMBP will be developed prior to construction and will be updated prior to operation. An RMP will be developed prior to aqueous ammonia being brought onto the Project Site.

Table 5.7-8
Applicable Permits

Permit/Approval Required	Schedule
Federal	None required
State	None required
Local (Kern County)	
Hazardous Materials Business Plan (HMBP) and Risk Management Plan (RMP)	30 days prior to start of construction and 30 days prior to start of operation
Permit to erect crane	60 days prior to start construction
Erection or dismantling of scaffolds, false work, or vertical shoring systems	60 days prior to start construction
Construction Field Safety Plan and Injury and Illness Prevention (IIP) Program	60 days prior to start construction
Construction Fire Protection and Prevention Plan	60 days prior to start construction

Table 5.7-8
Applicable Permits

Permit/Approval Required	Schedule
Operational Field Safety Plan and Injury and Illness Prevention (IIP) Plan	90 days prior to start of operations
Personal Protection Plan (Use of PPE)	90 days prior to start of operations

Source: HECA Project
Note:
PPE = personal protective equipment

5.7.7 References

American Conference of Governmental Industrial Hygienists. 2007. Threshold Limit Values (TLV) for Chemical Substances and Physical Agents and Biological Exposure Indices.

California Code of Regulations. ND. Title 8. "General Industry Safety Orders, Construction Safety Orders, and High Voltage Electrical Safety Orders."

Code of Federal Regulations. ND. Title 29 Part 1926. "Safety and Health Regulations for Construction."

———. ND. Title 29 Part 1910. "Occupational Safety and Health Standards."

Hydrogen Energy California (HECA) Project Team. 2008. Field work and observations.

National Fire Protection Association. 2006. *A Compilation of NFPA Codes, Standards, Recommended Practices and Guides.* Quincy, Massachusetts.

National Institute for Occupational Safety and Health. 1978. Health Hazard Evaluation Report, U.S. Army Corps of Engineers, Ozark Power Plant, Ozark, Kansas.

———. 1983. Health Hazard Evaluation Report, Grand Gulf Nuclear Power Plant, Port Gibson, Mississippi. HETA-83-132-1508.

———. 1985. Health Hazard Evaluation Report, Niagara Mohawk Power Corporation, Lycoming, New York. HETA-85-493-1786.

———. 1986. Health Hazard Evaluation Report, City of Ames Municipal Power Plant, Ames, Iowa. HETA-86-422-1891.

———. 1992. Health Hazard Evaluation Report, U.S. Army Corps of Engineers, Ozark Power Plant, Ozark, Kansas. HETA-92-0243-2377.

National Safety Council. 1997. Accident Prevention Manual. Chapter 11, Fire Protection. pp. 261-318.

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Adequacy Issue: Adequate ____ Inadequate ____ DATA ADEQUACY WORKSHEET Revision No. 0 Date 3/28/08

Technical Area: **Worker Safety** Project: ____ Technical Staff: Tim Joseph

Project Manager: ____ Docket: ____ Technical Senior: ____

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (1)	...provide a discussion of the existing site conditions, the expected direct, indirect and cumulative impacts due to the construction, operation and maintenance of the project, the measures proposed to mitigate adverse environmental impacts of the project, the effectiveness of the proposed measures, and any monitoring plans proposed to verify the effectiveness of the mitigation.	Section 5.7.1		
Appendix B (g) (11) (A)	A description of the safety training programs which will be required for construction and operation personnel.	Section 5.7.2		
Appendix B (g) (11) (B)	A complete description of the fuel handling system and the fire suppression system.	Section 5.7.2		
Appendix B (g) (11) (C)	Provide draft outlines of the Construction Health and Safety Program and the Operation Health and Safety Program, as follows:	Section 5.7.2		
	Construction Health and Safety Program: * Injury and Illness Prevention Plan (8 Cal. Code Regs., § 1509);	Section 5.7.2		
	* Fire Protection and Prevention Plan (8 Cal. Code Regs., § 1920);	Section 5.7.2		
	* Personal Protective Equipment Program (8 Cal. Code Regs., §§ 1514-1522)	Section 5.7.2		
	Operation Health and Safety Program: * Injury and Illness Prevention Program (8 Cal. Code Regs., § 3203);	Section 5.7.2		
	* Fire Prevention Plan (8 Cal. Code Regs., § 3221);	Section 5.7.2		
	* Emergency Action Plan (8 Cal. Code Regs., § 3220);	Section 5.7.2		
Appendix B (g) (11) (C) (cont.)	Personal Protective Equipment Program (8 Cal. Code Regs., §§ 3401-3411).	Section 5.7.2		

Adequacy Issue: Adequate ____ Inadequate ____ DATA ADEQUACY WORKSHEET Revision No. 0 Date 3/28/08

Technical Area: **Worker Safety** Project: ____ Technical Staff: Tim Joseph

Project Manager: ____ Docket: ____ Technical Senior: ____

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (i) (1) (A)	Tables which identify laws, regulations, ordinances, standards, adopted local, regional, state, and federal land use plans, leases, and permits applicable to the proposed project, and a discussion of the applicability of, and conformance with each. The table or matrix shall explicitly reference pages in the application wherein conformance, with each law or standard during both construction and operation of the facility is discussed; and	Section 5.7.4		
Appendix B (i) (1) (B)	Tables which identify each agency with jurisdiction to issue applicable permits, leases, and approvals or to enforce identified laws, regulations, standards, and adopted local, regional, state and federal land use plans, and agencies which would have permit approval or enforcement authority, but for the exclusive authority of the commission to certify sites and related facilities.	Section 5.7.6		
Appendix B (i) (2)	The name, title, phone number, address (required), and email address (if known), of an official who was contacted within each agency, and also provide the name of the official who will serve as a contact person for Commission staff.	Section 5.7.5		
Appendix B (i) (3)	A schedule indicating when permits outside the authority of the commission will be obtained and the steps the applicant has taken or plans to take to obtain such permits.	Section 5.7.6		