APPENDIX 10F

Chemical Engineering Design Criteria

10F.1 Introduction

Control of the design, engineering, procurement, and construction activities on the project will be completed in accordance with various predetermined standard practices and project specific programs/practices. An orderly sequence of events for the implementation of the project is planned consisting of the following major activities:

- Conceptual design
- Licensing and permitting
- Detailed design
- Procurement
- Construction and construction management
- Startup, testing, and checkout
- Project completion

The purpose of this appendix is to summarize the general chemical engineering design criteria for the project. These criteria form the basis of the design for the chemical components and systems of the project. More specific design information is developed during detailed design to support equipment and erection specifications. It is not the intent of this appendix to present the detailed design information for each component and system, but rather to summarize the codes, standards, and general criteria that will be used.

Subsection 10F.2 summarizes the applicable codes and standards and Subsection 10F.3 includes the general criteria for design water quality, chemical conditioning, chemical storage, and wastewater treatment.

10F.2 Design Codes and Standards

The design and specification of all work will be in accordance with the laws and regulations of the federal government and the state of California and local codes and ordinances. Industry codes and standards partially unique to chemical engineering design to be used in design and construction are summarized below.

- ANSI B31.1 Power Piping Code
- American Society for Testing and Materials (ASTM)
- California Building Standards Code 2001 (CBSC)
- Occupational Safety and Health Administration (OSHA)
- Steel Structures Painting Council Standards (SSPC)
- Underwriters Laboratories (UL)
- American Waterworks Association (AWWA)

Other recognized standards will be used as required to serve as design, fabrication, and construction guidelines when not in conflict with the above-listed standards.

The codes and industry standards used for design, fabrication, and construction will be the codes and industry standards, including all addenda, in effect as stated in equipment and construction purchase or contract documents.

10F.3 General Criteria

10F.3.1 Design Water Quality

10F.3.1.1 Eastshore Energy Center Water Supply

Water for the Eastshore Energy Center will be supplied by the City of Hayward through the San Francisco Public Utilities Commission. All general water requirements will be provided by this existing source.

A typical water analysis is presented in Subsection 8.14, Water Resources.

10F.3.1.2 Construction Water

Water for use during construction will be supplied by the existing source.

10F.3.1.3 Fire Protection Water

The source of water for fire protection will be the potable water line from the City of Hayward located in Clawiter Road.

10F.3.2 Chemical Conditioning

10F.3.2.1 Circulating Water System Chemical Conditioning

Closed-loop engine cooling water chemical conditioning will use chemicals to minimize the formation of mineral scale. Scaling will be controlled by the use of an anti-corrosion agent, which is expected to be nitrite-based based on OEM recommendations.

10F.3.3 Chemical Storage

10F.3.3.1 Storage Capacity

19% aqueous ammonia storage tanks for the selective catalytic reduction system (SCR) will be sized to allow one month of plant operation at expected average operating conditions. This will result in the use of two 10,000-gallon tanks.

10F.3.3.2 Containment

Chemical storage tanks containing corrosive fluids will be surrounded by curbing. Curbing and drain-piping design will allow a full-tank capacity spill without overflowing the curbing. For multiple tanks located within the same curbed area, the largest single tank will be used to size the curbing and drain piping. For outdoor chemical containment areas, additional containment volume will be included for stormwater.

10F.3.3.3 Closed Drains

Waste piping for volatile liquids and wastes with offensive odors will use closed drains to control noxious fumes and vapors.

10F.3.3.4 Coatings

Tanks, piping, and curbing for chemical storage applications will be provided with a protective coating system. The specific requirements for selection of an appropriate coating will be identified prior to equipment and construction contract procurements.

10F.3.4 Wastewater Treatment

Plant process wastewaters will be collected and, if suitable, discharged to the City of Hayward sanitary sewer system. Sanitary wastewater will be discharged to the sanitary sewer system.