



South Texas Project Electric Generating Station 4000 Avenue F – Suite A Bay City, Texas 77414

July 30, 2008
ABR-AE-08000056

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville MD 20852-2738

South Texas Project
Units 3 and 4
Docket Nos. 52-012 and 52-013
Response to Requests for Additional Information

- References:
1. Letter, Paul Kallan to Greg Gibson, "Request for Additional Information, Letter Number One Related to the Environmental Report for the South Texas Combined License Application", dated May 19, 2008 (AE-ABR-08000097)
 2. Letter, Greg Gibson to Document Control Desk, "Response to Requests for Additional Information", dated July 2, 2008 (ABR-AE-08000048)

Attached are 21 responses to NRC questions included in Reference 1. Nineteen of these responses are for the 75-day response group as detailed in Reference 2. They are listed below by Question Number:

02.03-09	02.05-19	04.04-04
02.04.01-05	02.05-20	04.04-05
02.05-05	02.05-25	04.04-12
02.05-13	02.05-26	04.04-18
02.05-14	02.05-28	05.03.03.01-01
02.05-16	04.04-01	
02.05-17	04.04-02	

Also, two Request for Additional Information responses from the 90-day response group, 02.03-01 and 03.07-01, were completed and are included.

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When a change to the COLA is indicated by a question response, the change will be incorporated into the next routine revision of the COLA following NRC acceptance of the question response.

STPNOC is extending the schedule for the remaining 6 responses to NRC questions that were in the 75-day response group. These responses were assigned to STPNOC's prime environmental contractor, Tetra Tech, who was unable to deliver them within the 75-day response period that they had negotiated and agreed to meet. STPNOC is currently working with Tetra Tech to produce quality responses and intends to deliver these responses with the remainder of the 90-day response group. These include:

02.05-04	02.05-12
02.05-06	04.04-03
02.05-11	05.03.04-01

There are no commitments in this letter.

If you have any questions, please feel free to contact me at (361) 972-4626, or Russell W. Kiesling at (361)-972-4716

I declare under penalty of perjury that the foregoing is true and correct.

Executed on

July 30, 2008



Gregory T. Gibson
Manager, Regulatory Affairs
South Texas Project, Units 3 & 4

rwk

Attachments:

- | | |
|-------------------------|-----------------------------|
| 1. Question 02.03-01 | 12. Question 02.05-26 |
| 2. Question 02.03-09 | 13. Question 02.05-28 |
| 3. Question 02.04.01-05 | 14. Question 03.07-01 |
| 4. Question 02.05-05 | 15. Question 04.04-01 |
| 5. Question 02.05-13 | 16. Question 04.04-02 |
| 6. Question 02.05-14 | 17. Question 04.04-04 |
| 7. Question 02.05-16 | 18. Question 04.04-05 |
| 8. Question 02.05-17 | 19. Question 04.04-12 |
| 9. Question 02.05-19 | 20. Question 04.04-18 |
| 10. Question 02.05-20 | 21. Question 05.03.03.01-01 |
| 11. Question 02.05-25 | |

cc: w/o attachment except*
(paper copy)

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Question Number: 2.3-1

QUESTION:

Provide USACE documentation regarding the status of the MCR as waters of the US.

Full Text (Supporting Information):

Provide U.S. Army Corps of Engineers documentation that the Main Cooling Reservoir (MCR) is determined to not be “waters of the United States.” Describe the status of the MCR as “navigable waters of the United States” in light of the above determination.

RESPONSE:

The U.S. Army Corps of Engineers (USACE) has yet to make a determination as to whether the main cooling reservoir (MCR) is considered waters of the United States. In a letter to the U.S. Army Corps of Engineers, (USACE) dated April 9, 2008, STPNOC has requested a formal verification of the jurisdictional status of ditches, streams, and other waters including, the MCR.

In a letter dated June 27, 2007, TCEQ concurred with the STPNOC that the MCR is not within the jurisdiction the State of Texas holds under the TPDES program. STPNOC also believes the Environmental Protection Agency (EPA) did not interpret the MCR to be jurisdictional when the EPA issued the original STP site NPDES permit in 1985 and subsequent renewals of same. The Colorado River and not the MCR is the body of water cited as “waters of the U.S.” in the original NPDES permit and subsequent renewals.

CANDIDATE COLA REVISION:

No COLA revision is required as a result of this response.

Question Number: 2.3-9**QUESTION:**

Provide construction details, purpose, and function of relief wells surrounding the MCR.

Full Text (Supporting Information):

- (a) Provide construction details of the MCR relief wells, (i.e., screened interval and depth) and describe the purpose of the relief wells. If the MCR relief wells are designed and function to maintain the structural integrity of the dike surrounding the MCR, then state that purpose and describe briefly how it is achieved. If the MCR relief wells are designed to isolate the MCR hydraulically from the Upper Shallow Aquifer, then state that purpose and describe briefly how it is achieved.
- (b) If the MCR relief wells discharge waters that originate from the MCR, then so state. If the MCR relief wells penetrate the Upper Shallow Aquifer, and some of the discharge/recharge is from/to that aquifer, so state and provide an estimate of the quantities and qualities of each flow component.
- (c) Is the influence of MCR relief wells apparent in the potentiometric plots that appear in the application, or is their influence local to the dike that surrounds the MCR and not seen in potentiometric plots of the Upper Shallow Aquifer? Responses to these questions about the MCR relief wells will clarify the purpose and function of these wells, and the route that a release from the MCR may take as it returns to waters that surround the site.

RESPONSE:

The STP Units 1 & 2 Updated Final Safety Analysis Report (UFSAR) describes the purpose and operation of the main cooling reservoir (MCR) relief wells (Reference 1). Information from UFSAR Sections 2.4.8.2.5, 2.4.13.3.2.2, 2.4.13.3.2.3, 2.5.6.6.1, 2.5.6.6.1.3, and 2.5.6.6.1.4 has been summarized to answer questions (a) and (b).

Question (a):

Examples of MCR relief well construction details are provided in the attached drawings from the STP Units 1 & 2 UFSAR (Figures 35, 3C, 3D, 4A, 4B, and 4C). The relief wells are a passive system designed to reduce the exit gradient of seepage from the MCR that could result in heave or boiling of the top stratum.

The UFSAR describes the need for seepage control beneath and through the MCR embankment because the differential head placed on the embankment can cause seepage to flow through pervious strata beneath the embankment resulting in the development of excess hydrostatic pressures on these strata. Subsurface soil conditions beneath the embankment are described in UFSAR Section 2.5.6.2.1. Surface soils over most of the length of the MCR embankment area primarily consist of Strata 1a and 1b (clay) underlain by a zone of granular material (Stratum 2).

(Stratum 2 generally occurs between 8 and 42 feet below ground surface, which correlates to the sands of the Upper Shallow Aquifer.)

The purposes of the relief wells, as described in UFSAR Section 2.4.8.2.5, are specifically:

- “To minimize seepage through the embankment section and prevent detrimental surface manifestation on downstream slopes.
- To minimize underseepage beneath the embankment and control its exit in order to prevent detrimental uplift and surface manifestations at the downstream toe.
- To limit the maximum piezometric level at the relief well line to El. 27.0 MSL opposite the power block structures.”

The relief wells are not designed to isolate the MCR hydraulically from the Upper Shallow Aquifer.

Seepage from the MCR is intercepted by a system of about 770 relief wells. According to UFSAR Subsection 2.5.6.6.1.3:

- “The wells are designed to reduce the computed exit gradient to 0.5 or less. However, the well spacing does not exceed 200 ft at any location where wells are required.
- Underseepage piezometers (Section 2.5.6.8.11) are installed to monitor the hydrostatic pressure in stratum 2.
- At least 50 percent of the ground seepage is to be intercepted.
- The piezometric elevation at the midpoint between the relief wells opposite the plant area structures is to be below El. 27.0 ft MSL.”

Relief well discharge is collected in toe and drainage ditches around the periphery of the MCR embankment, which discharge at various locations offsite. Groundwater flow that bypasses the relief wells exits downgradient from the site in the Upper Shallow Aquifer.

Question (b):

Seepage from the MCR is controlled in part by sand chimneys and drainage blankets constructed within the MCR embankment and by relief wells constructed along the toe of the embankment, screened into the sands of the Upper Shallow Aquifer. As stated in Environmental Report (ER) Subsection 2.3.1.2.3.3, the MCR design assumes that seepage from the MCR will enter the Shallow Aquifer. A portion of this seepage is captured and discharged through about 770 relief wells located around the reservoir. Groundwater is discharged from the passive relief wells and collected in toe and drainage ditches around the periphery of the MCR embankment. The water discharges off site to four receiving streams. Seepage that bypasses the relief wells continues to flow downgradient within the Upper Shallow Aquifer. In the STP Units 1 & 2 UFSAR, total seepage from the MCR was estimated to be 3,530 gpm, or approximately 5,700 acre-feet per year (AF/Y). Of that, approximately 68 percent, or 3,850 AF/Y, is discharged through the relief wells.

Surface and groundwater quality data are presented in Units 3 & 4 ER Section 2.3.3 (Water Quality). Information is provided on the chemistry of the MCR, selected MCR relief wells, selected groundwater monitoring wells, and other monitoring points of interests. The quality of surface water sampled from the MCR and that diverted from the MCR by the relief wells is summarized in Tables 2.3.3-3 through 2.3.3-6. Analyses of groundwater samples in the vicinity of STP are summarized in ER Tables 2.3.3-7 through 2.3.3-10.

Standard groundwater hydrogeochemical characteristics are discussed in ER Subsection 2.3.1.2.3.6. Table 2.3.1-19 lists regional hydrogeochemical data while Table 2.3.1-20 lists the hydrogeochemical data from selected wells within the STP boundary. Of the STP Units 3 & 4 groundwater observation wells sampled, National Secondary Drinking Water Standards (NSDWS) were exceeded for TDS and chloride in all wells, and for fluoride for one well. A trilinear diagram of the hydrogeochemical data is presented in ER Figure 2.3.1-34. A comparison of ER Table 2.3.1-20 (STP Units 3 & 4 groundwater observation wells) and ER Table 2.3.3-3 (MCR water quality data) suggests no strong geochemical correlation between the MCR waters and groundwater in the Shallow Aquifer north of the MCR. In addition, the potentiometric maps presented in ER Figure 2.3.1-25 indicate little, if any, evidence of mounding occurs north of the MCR. These data indicate that the relief wells are effective in reducing the aquifer head and minimizing the amount of seepage from the MCR to groundwater north of the MCR.

Question (c):

Subsection 2.3.1.2.3.4 of the ER states that the MCR may have a localized effect on the Shallow Aquifer due to the observation of an apparent hydraulic divide at the location of the Units 3 & 4 power block. This observation is based on the installation of 28 Units 3 & 4 observation wells. At this location, Upper Shallow Aquifer water levels indicate the prevailing groundwater flow from the north-northwest appears to be deflected partially to the east and partially to the west. This divergence in flow is likely due to the potentiometric head induced by the MCR on the Upper Shallow Aquifer and intercepted by the MCR relief wells and drainage blankets. Because water levels were not obtained from relief wells, the influence of the relief wells was not considered or accounted for when developing the potentiometric maps presented in ER Subsection 2.3.1.2. The potentiometric surface of the Lower Shallow Aquifer suggests a uniform northwest to southeast groundwater flow gradient, and a zone that is not influenced, or significantly influenced by seepage from the MCR.

REFERENCES:

1. STP Units 1 & 2 UFSAR, Revision 13.

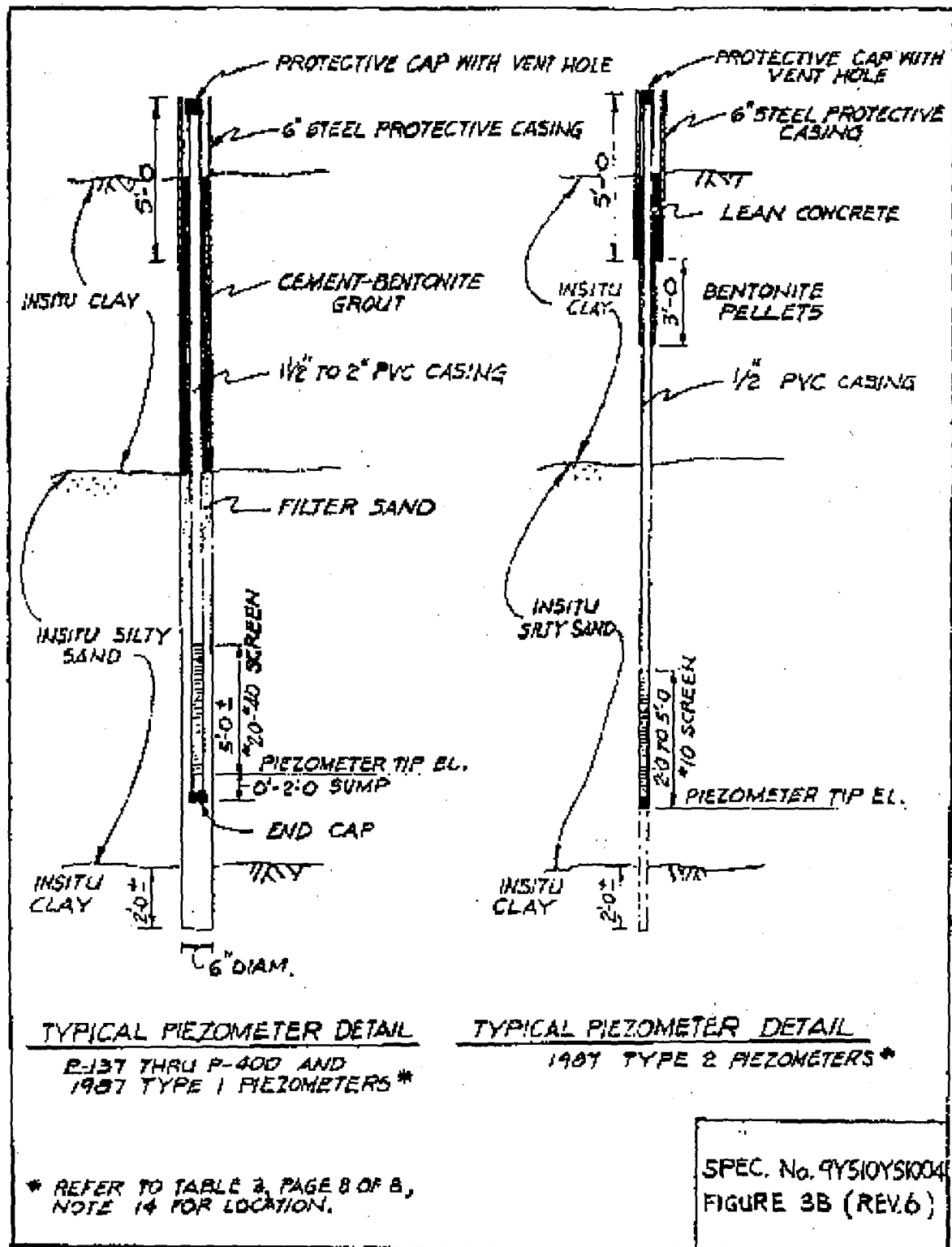
CANDIDATE COLA REVISION:

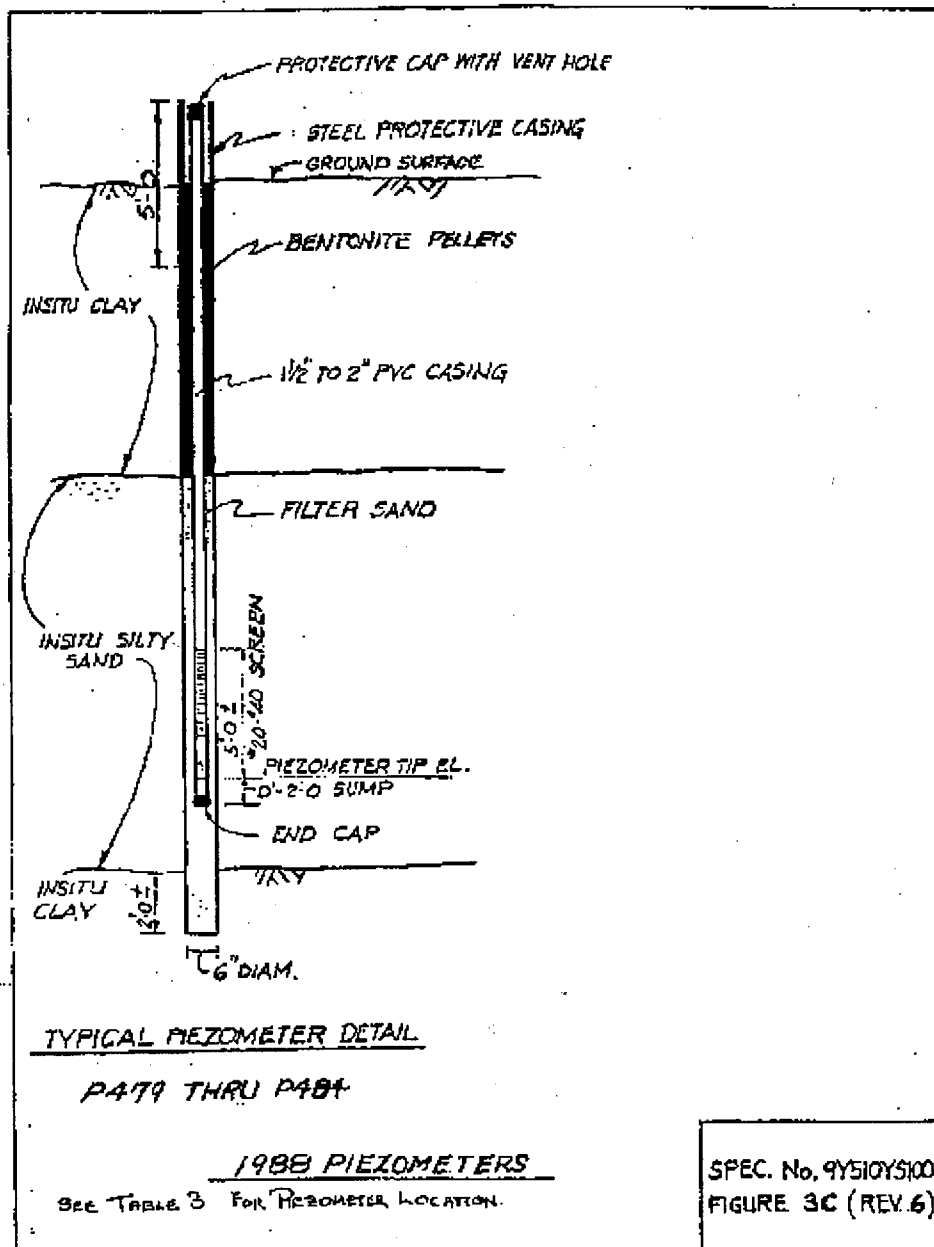
The following revisions to ER Subsection 2.3.1.2.3.3, third paragraph, are suggested to clarify the role of the MCR relief wells. Inserted information is summarized from the STP Units 1 & 2 UFSAR:

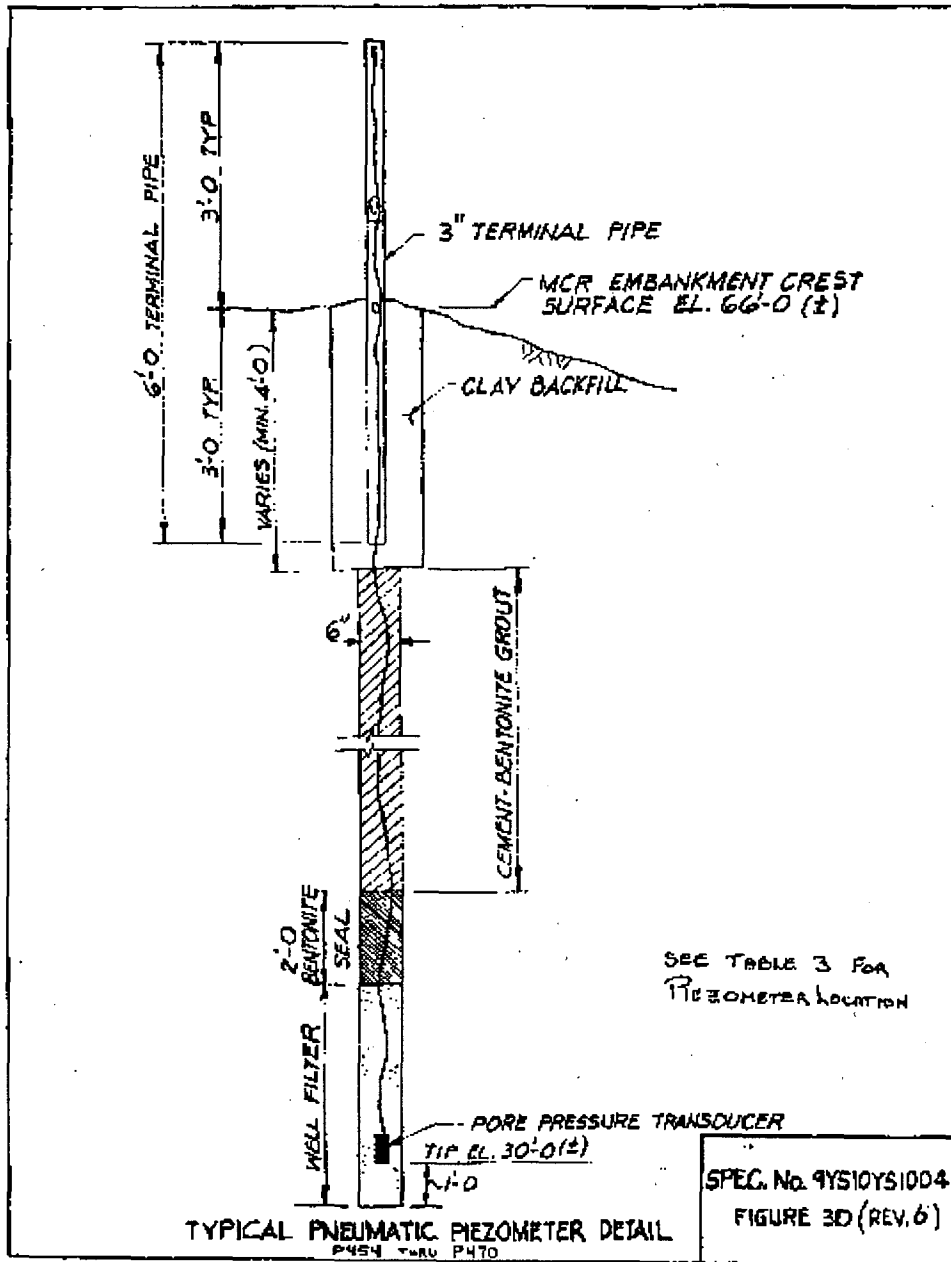
The 7000-acre MCR is unlined and may act as a local recharge source to the Shallow Aquifer at the site. The normal maximum operating level elevation is 49 ft above MSL, imposing a hydraulic head of up to 20 ft above ground surface. The capacity of the MCR at this elevation is approximately 202,600 acre-ft. The MCR embankment dike and associated features are designed to lower the hydraulic gradient across the embankment to the extent that the potentiometric levels of the soil layers in the site area stay below the ground surface. This is accomplished through the use of low permeability clay (compacted fill), relief wells, and sand drainage blankets. Discharge to the environment from the MCR occurs from seepage through the reservoir floor to the groundwater. Groundwater flow from the MCR is intercepted in part by the relief well system, installed into the sands of the Upper Shallow Aquifer, around the perimeter of the MCR, which is. Groundwater is discharged from the passive relief wells and collected in toe and drainage ditches around the periphery of the MCR embankment and then discharged to surface water features at various locations. Seepage discharge from the MCR is composed of two parts: (a) seepage that is collected and discharged through approximately 770 relief wells that have been installed in the Upper Shallow Aquifer at the toe of the embankment around the reservoir to relieve excess hydrostatic pressure and (b) seepage through the Upper Shallow Aquifer that bypasses the relief wells and continues down gradient. During the design stage, total seepage of the MCR was estimated to be 3530 gpm, or approximately 5700 acre-ft/yr. Of this value, approximately 68%, or 3850 acre-ft/yr, would be discharged through the relief wells (Reference 2.3.1-9).

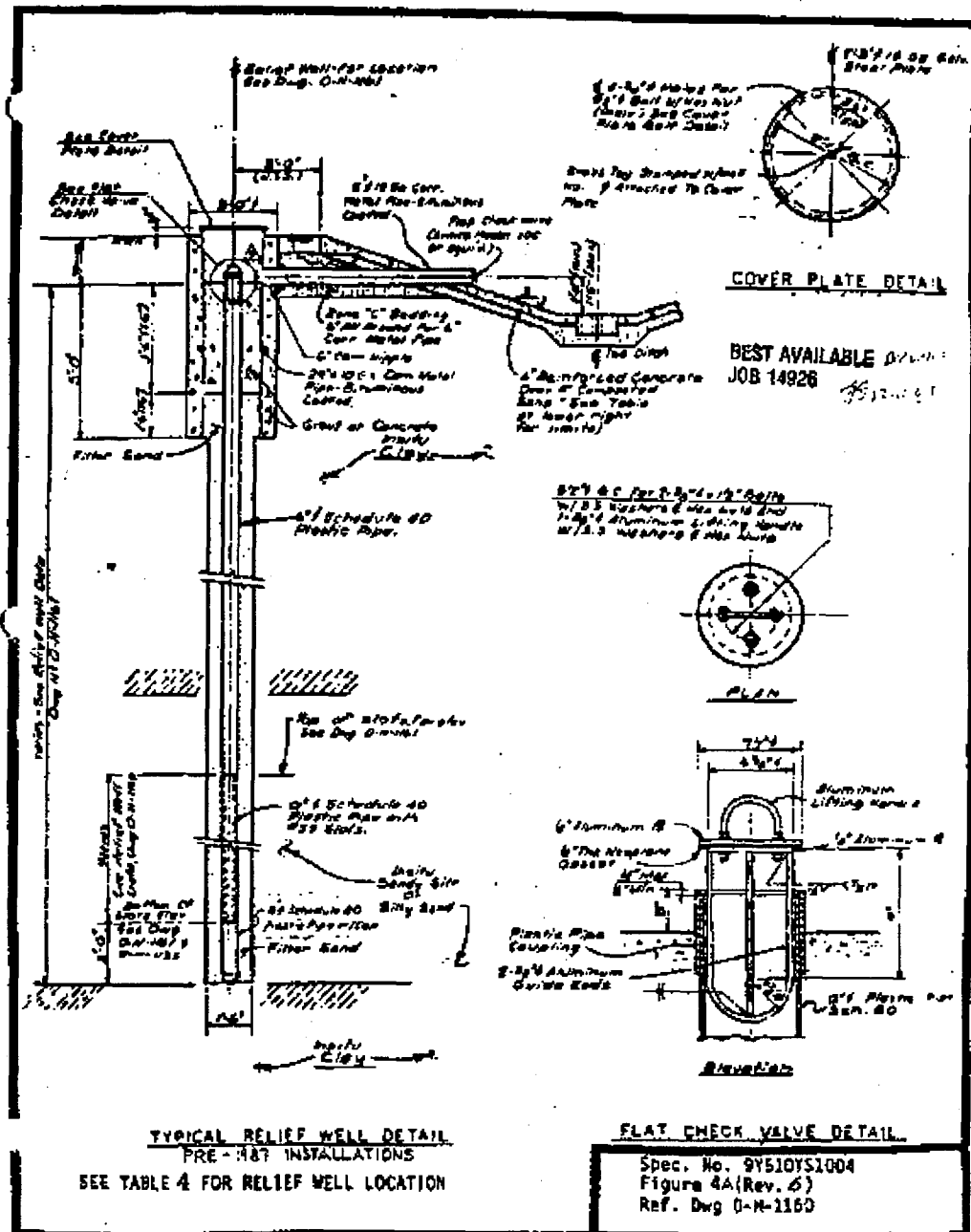
The purpose of MCR seepage controls are as follows (Reference 2.3.1-9):

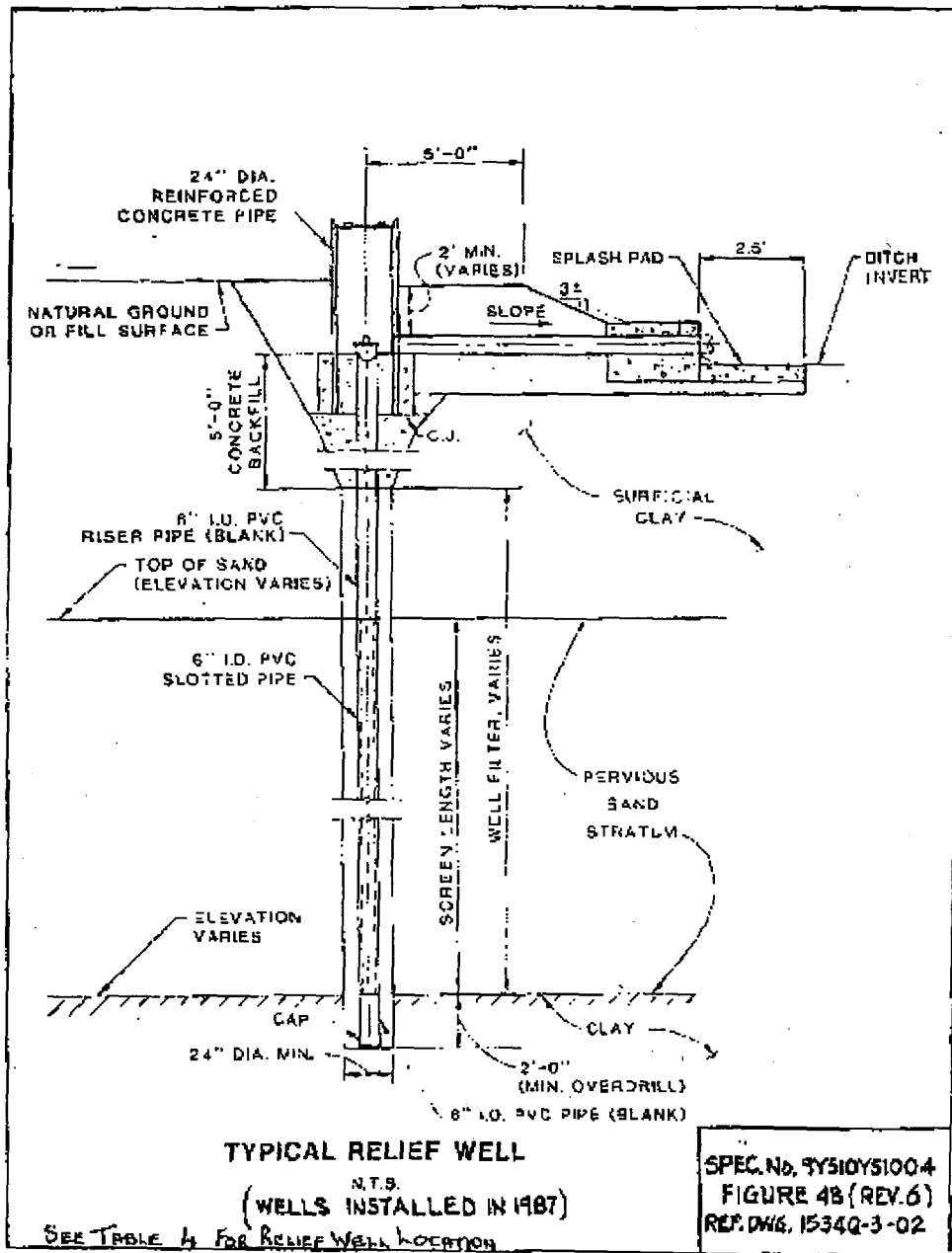
- To minimize seepage through the embankment section and prevent detrimental discharge on downstream slopes.
- To minimize underseepage beneath the embankment and control its exit in order to prevent detrimental uplift and discharge at the downstream toe.
- To limit the maximum piezometric level at the relief well line to El. 27.0 MSL opposite the power block structures.

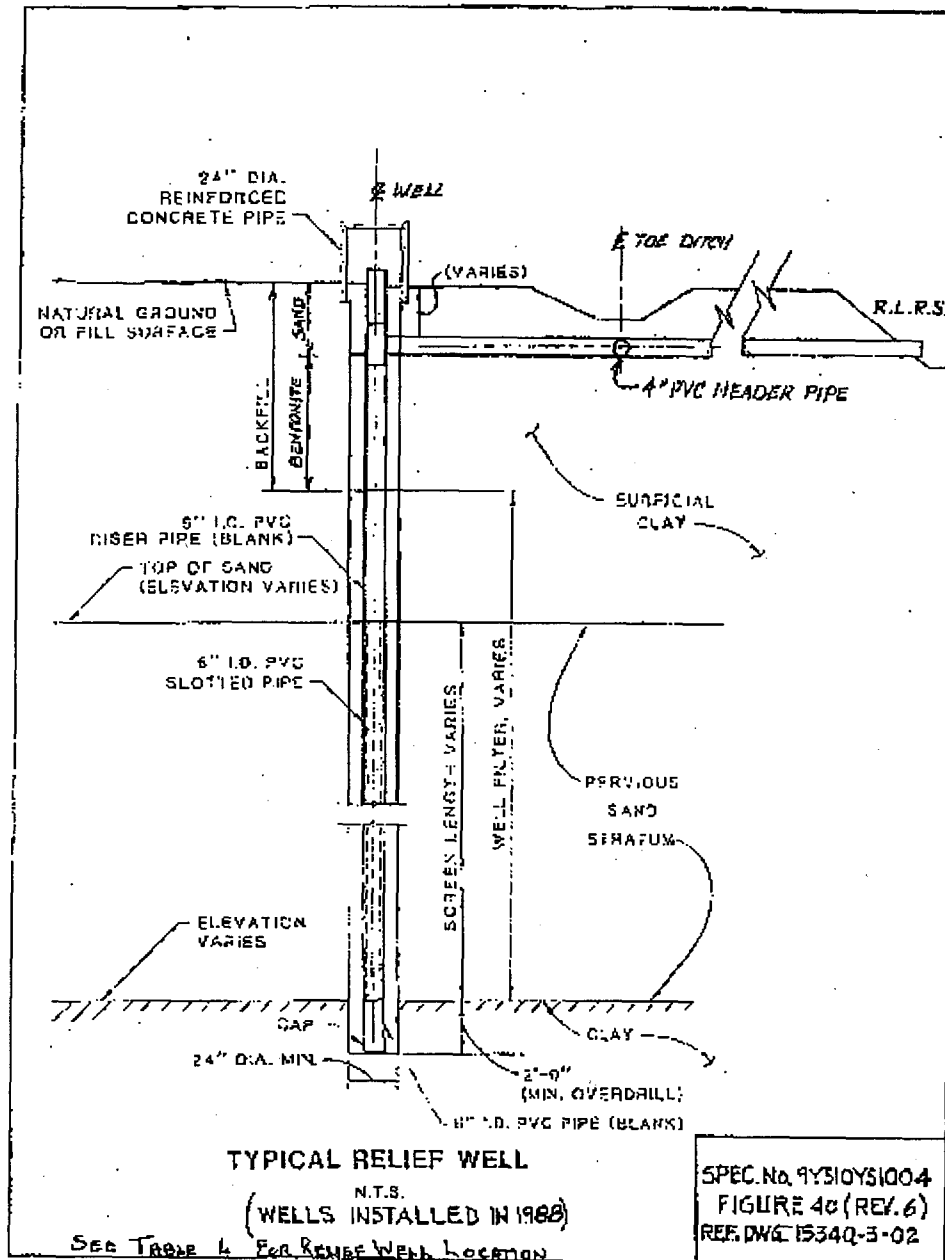












Question Number: 2.4.1-5

QUESTION:

Provide graphics that illustrate the salt deposition isopleths overlaid on existing habitat maps and wetland maps.

Full Text (Supporting Information):

The extent and distribution of salt drift and deposition have been modeled and described verbally in the ER. Provide graphics that illustrate the salt deposition isopleths overlaid on existing habitat maps and wetland maps.

RESPONSE:

The attached figure shows the salt deposition isopleths overlaid on the habitat and wetlands maps.

The results shown on the attached new Figure 5.3-1 are based on SACTI predictions using the site layout as provided in Revision 1 of the COLA ER. This site layout is being revised to reflect a change in the design and location of the Ultimate Heat Sink. When this design change is complete, the SACTI model will be re-run to ascertain any changes to salt deposition predictions and the changes will be reflected in a subsequent revision of the COLA ER. The attached new Figure 5.3-1 is presented to demonstrate how the figure would have been revised had there not been a design change.

CANDIDATE COLA REVISION:

Figure 5.3-1 in the ER will be replaced with the attached new Figure 5.3-1.

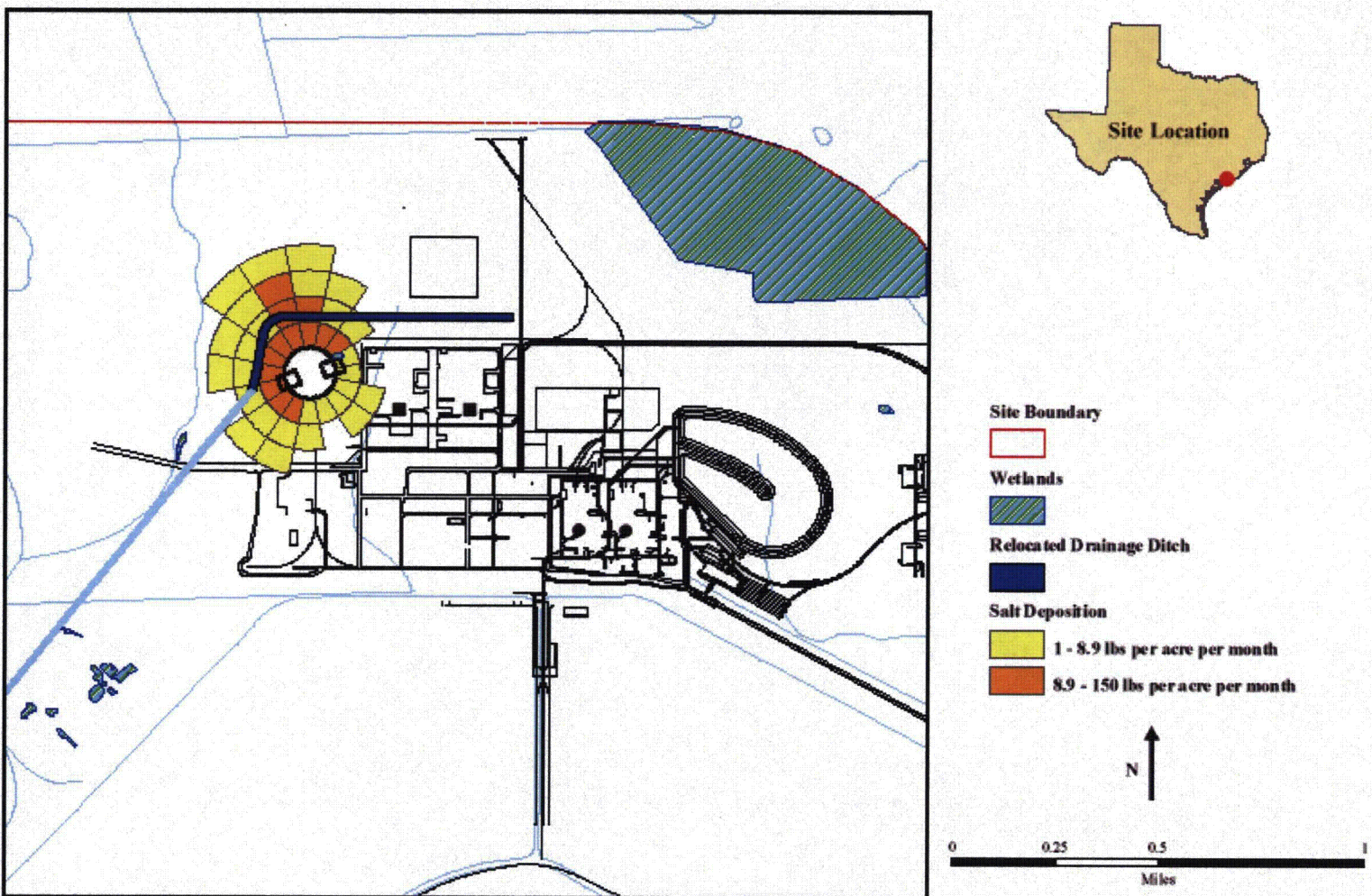


Figure 5.3-1 Summer Salt Deposition

Question Number: 2.5-5**QUESTION:**

Identify public and private recreational facilities and opportunities, including present and projected capacity and percentage of use.

Full Text (Supporting Information):

There is no information about current and projected future use of outdoor recreation areas. Is there a possibility that water used by the plant or the plant-related population will affect either water quantity or water quality for any recreation purposes? Identify the basis for any conclusions regarding this matter at the STP site and the alternative sites.

RESPONSE:

In 1998, TPWD commissioned a study analyzing recreational needs, called the Texas Outdoors: A Vision for the Future. In this report, Texas Parks and Wildlife Department (TPWD) acknowledges that recreation demands will increase and that there is a lack of basic information about users and nonusers of parks (TPWD 1998). In February 2000, Texas Parks and Wildlife contracted with Texas Tech University to produce a study of conservation and outdoor recreation issues in Texas that would establish the foundation for the Department's future planning efforts. One of the conclusions reached from the study is that there is a need to provide more local and state parks (TPWD 2001).

Through consultation with TPWD and Lower Colorado River Authority (LCRA), annual visitors' information is provided below for outdoor recreational areas. Projected capacity and percentage of use is not available for the state park, wildlife management areas, national wildlife refuges, preserve, or LCRA parks.

Surface water impacts should be considered to analyze impacts to water quantity or water quality for recreational purposes. Surface water quantity would not be affected during construction of STP Units 3 & 4 since groundwater will be used. During the operations phase, the Colorado River will supply make-up water to the MCR. As discussed in Section 5.2, water quantity impacts to the Colorado River would be SMALL. Water quality impacts would also be SMALL for construction and operation of Units 3 & 4 (Sections 4.2 and 5.2). Therefore, impacts to recreational areas due to changes in water quantity or water quality are SMALL and would not warrant mitigation. The only recreation area listed in Table 2.5-14 that is on the Colorado River and downstream of the STP site, and would thus have the potential to be affected by STP, is the LCRA Matagorda Bay Nature Park.

For alternative sites, this level of analysis was not warranted pursuant to RG 4.2, RG 4.7 and NUREG-1555. STPNOC performed a reconnaissance review of data and information pertinent to the alternate sites. An analysis of public and private recreational facilities and opportunities was beyond the scope of that analysis.

REFERENCES:

TPWD 1998. Texas Outdoors: A vision for the Future: A report for the Texas parks and Wildlife Department. Available online at http://www.tpwd.state.tx.us/publications/nonpwdpubs/media/tx_outdoors_vision_for_future.pdf, accessed May 28, 2008.

TPWD 2001. Texas Parks and Wildlife Department. *Texas Parks and Wildlife for the 21st Century*, available online at http://www.tpwd.state.tx.us/publications/nonpwdpubs/media/tpwd_21st_century.pdf, accessed April 17, 2008.

CANDIDATE COLA REVISION:

Table 2.5-24 will be revised as follows:

Table 2.5-24 Recreation Areas Within 50-Miles of STP

Name	Acreage	Location	Annual Visitors	Overnight Facilities
Wildlife Management Areas				
Matagorda Island	56,688	Calhoun County	1,100 Not available	Primitive Camping
Mad Island	7,200	9 miles east of Collegeport – Matagorda County	1,200	None
Peach Point	11,938	West of Freeport near Jones Creek, Brazoria County	2,700	None
D.R. Winterman	246	Egypt, Wharton County	Less than 10 Not available	None
Mad Island Marsh Preserve	7,063	South east of Collegeport, Matagorda County	1,700	None
Big Boggy National Wildlife Refuge	5,000	Wadsworth, Brazoria County	250	None
San Bernard National Wildlife Refuge	34,679	Matagorda and Brazoria Counties	32,000	None
Brazoria National Wildlife Refuge	43,388	Angleton, Brazoria County	35,000	None
Nannie M. Stringfellow Wildlife Management Area	3,664	8 miles from Brazoria, Brazoria County	300 Not available	None
Parks				
Brazos Bend State Park	5,000	Needville, Fort Bend County	206,000	Campsites with water and electricity
LCRA Hollywood Bottom	36	Along the Colorado River south of Wharton, Wharton County	3,700	Camping with limited facilities
LCRA Matagorda Bay Nature Park	1,600	Mouth of the Colorado River on the Matagorda Peninsula - Matagorda County	25,000 ¹ Not Available	Tent camping on beach 70 site RV-park with full utility hook-ups
LCRA FM-521 River Park	13	Four miles west of Wadsworth on FM 521- Matagorda County	3,000	None

1. This number reflects how many overnight RV stays that have occurred since the park opened.

Question Number: 2.5-13**QUESTION:**

Discuss the participation in federal school free and low-cost lunch programs.

Full Text (Supporting Information):

Some of the local school districts have majority participation in the federal school lunch program. For each ISD, discuss (including reported numbers of participating students in each ISD) how widespread the participation is and how important this program is to ISD finances.

RESPONSE:

USDA guidelines for free and reduced-price lunch eligibility are set at 130% and 185%, respectively, of the federal poverty thresholds for each household size. For this reason, participation is not necessarily a good reflection of actual poverty within a school population, because many children whose families are not below the poverty guidelines are eligible for the lunch program. For example, according to the 2000 Census, the percent of individuals below the poverty threshold was 18.5% for Matagorda County and 10.2 for Brazoria County, while 51.9% and 38.7%, respectively, of public school students were eligible for the lunch program in each county.

CANDIDATE COLA REVISION:

Add to Section 2.5.2.8:

The USDA Food & Nutrition Service supports a free and reduced-price lunch program to ensure that all schoolchildren have access to proper nutrition during the school day. The USDA guidelines for program eligibility are based on household size and income, and are set at 130% and 185%, respectively, of the federal poverty thresholds for each household size. For this reason, participation is not necessarily a good reflection of actual poverty within a school population, because many children whose families are not below the poverty guidelines are eligible for the lunch program. For example, according to the 2000 Census, the percent of individuals below the poverty threshold was 18.5% for Matagorda County and 10.2% for Brazoria County, while 51.9% and 38.7%, respectively, of public school students were eligible for the lunch program in each county.

Table 2.5.2-xx presents the numbers and percentages of students in each ROI school district who are eligible for the free and reduced-price lunch program. Free-lunch students comprise the majority (from 66.7% to 89.8%) of program-eligible students. The percentage of free-lunch eligible students ranges from 40% to 51.4% in Matagorda County (the Matagorda ISD does not participate in the program), and from 15.7% to 46.3% in Brazoria County.

**Table 2.5.2-XX Eligibility for Free and Reduced Lunch Program,
Public ISDs in the ROI, 2005-06 School Year**

Independent School District	Total Students in ISD	Free Lunch Eligible		Reduced Lunch Eligible		Free and Reduced Lunch Total	
		Number	Percent of Total Students	Number	Percent of Total Students	Number	Percent of Total Students
Matagorda County							
Bay City ISD	4,140	2,128	51.4%	243	5.9%	2,371	57.3%
Matagorda ISD	56	0	0.0%	0	0.0%	0	0.0%
Palacios ISD	1,638	975	59.5%	145	8.9%	1,120	68.4%
Tidehaven ISD	889	412	46.3%	107	12.0%	519	58.4%
Van Vleck ISD	963	385	40.0%	115	11.9%	500	51.9%
County total	7,686	3,900	50.7%	610	7.9%	4,510	58.7%
Brazoria County							
Columbia-Brazoria ISD	13,266	5,155	38.9%	1,194	9.0%	6,349	47.9%
Angleton ISD	6,444	2,510	39.0%	538	8.3%	3,048	47.3%
Brazosport ISD	13,260	5,482	41.3%	1,259	9.5%	6,741	50.8%
Columbia-Brazoria ISD	3,056	1,129	36.9%	253	8.3%	1,382	45.2%
Damon ISD	164	76	46.3%	38	23.2%	114	69.5%
Danbury ISD	759	158	20.8%	44	5.8%	202	26.6%
Pearland ISD	15,543	2,445	15.7%	847	5.4%	3,292	21.2%
Sweeny ISD	2,086	593	28.4%	215	10.3%	808	38.7%
County total	54,578	17,548	32.2%	4,388	8.0%	21,936	40.2%
Statewide	4,523,873	1,809,295	40.0%	372,402	8.2%	2,181,697	48.2%

Question Number: 2.5-14**QUESTION:**

Discuss the importance of local “roll-back” elections for ISD finances operating revenue.

Full Text (Supporting Information):

Explain the importance of the “rollback election” mechanism on ISD M&O funds to the individual ISDs in the region of STP.

RESPONSE:

Over the past few years, the Texas legislature has attempted to provide property tax relief by implementing a number of measures (including expansion of the applicability of the franchise tax, which affects STP). One of these measures was to provide an annual cap on ISD property tax rates applied to maintenance and operations (M&O). If a local ISD board sets a property tax rate above the state cap, the rate has to be approved by the voters in a special “rollback” election. The election is automatic, and does not require a petition process. The exception to this requirement is an ISD’s need to respond to a recent disaster (hurricanes, floods, and similar events, but not droughts). The M&O portion of the rollback tax rate is the tax rate that would be needed to raise 8 percent more operating funds than the unit levied in the preceding year.

A detailed analysis of the impacts of this mechanism to ISDs in the ROI is not possible, because it cannot be determine what tax rates individual ISD boards would decide to impose from year to year, nor is it possible to predict how local voters would respond to such an election at any given time. In general, however, if local voters do not support rates above the state cap, schools may be forced to reduce expenses in some way (larger classes, cutting back on “extra” programs such as art or music, reducing administrative or support staff, and so on). Districts with increasing enrollments, without a corresponding increase in property tax revenues or state funding, would likely experience the greatest impacts.

CANDIDATE COLA REVISION:

Insert the following paragraph into Subsection 2.5.2.3.5:

The Texas legislature has recently attempted to provide property tax relief by implementing an annual cap on ISD property tax rates used to fund M&O. If a local ISD board sets a property tax rate above the state cap, the rate must be approved by the voters in a special “rollback” election. The election is automatic, and does not require a petition process. The exception to this requirement is an ISD’s need to respond to a recent disaster (hurricanes, floods, and similar events, but not droughts). The M&O portion of the rollback tax rate is the tax rate that would be needed to raise 8 percent more operating funds than the unit levied in the preceding year. It is not possible at this time to determine how rollback elections would affect the ISDs in the ROI.

Question Number: 2.5-16

QUESTION:

Describe the tax impact of the expanding San Antonio share of the STP 1 & 2, and impact of STP 3 & 4.

Full Text (Supporting Information):

The staff has learned the current ownership of STP 1 & 2 has changed over time, with San Antonio, the non-taxable entity, taking a larger share of the STP 1 & 2 plants. Describe the past effect and likely future effect of this trend of STP Unit 1 & 2 ownership and the future ownership of Units 3 and 4 for local government and ISD revenues.

RESPONSE:

The issue of tax impacts is addressed in Section 4.4.2 for construction impacts, and in Section 5.8.2 for operations impacts.

The taxes paid by STP owners over the past several years have been based on the percent of STP's private ownership at the time. Municipal or other publicly owned utilities are not subject to taxation by public entities, and are thus not subject to franchise, sales, or property taxes. Therefore, if the proportion of public ownership were to increase, tax revenues from the STP plant would decline. However, if partial ownership were to shift from one public owner to another public owner, tax impacts would be unchanged.

In response to RAI 5.8-2, a sensitivity analysis table has been added to Section 5.8.2.2 to show tax impacts for a range of ownership conditions.

CANDIDATE COLA REVISION:

No COLA revision is required as a result of this response.

Related RAI 5.8-2 resulted in changes to the ER text and the inclusion of Table 5.8-5. Please refer to RAI response 5.8-2 for those COLA revisions.

Question Number: 2.5-17

QUESTION:

Describe the future impact of the growth in electricity production on water demand in the Colorado River.

Full Text (Supporting Information):

The ER states that “steam–electric water demand will increase by 45%, from 153,522 acre–feet to 222,058 acre–feet in the same time period.” Discuss what projects account for the increase.

RESPONSE:

This information was obtained from the Texas Water Development Board’s *Water for Texas 2007*. This publication does not provide specific projects on which the projection was based, but does include the associated water demand for proposed projects. STP was included in the regional plan (which was the basis for *Water for Texas 2007*), which was based on STP using its full water right (102,000 AF/yr) by 2030.

The report’s Chapter 4, *Population and Water Demand Projections*, states as follows (page 127):

“Representatives of investor-owned Texas utilities, under contract with TWDB, prepared projections for this category. They based projections on the anticipated demand for electricity and the amount of water needed to produce each unit of electricity (kilowatt-hours). Demand for electricity was assumed to grow in direct proportion to the population and to commercial and manufacturing sectors. The projections also included savings in the first 20 years generated by more efficient production methods.”

CANDIDATE COLA REVISION:

No COLA revision is required as a result of this response.

Question Number: 2.5-19

QUESTION:

Confirm source for Table 2.5–9.

Full Text (Supporting Information):

Table 2.5–9 seems to have as its source Reference 2.5–11 not 2.5–12.

RESPONSE:

The source for Table 2.5-9 is Reference 2.5-11.

CANDIDATE COLA REVISION:

The table source will be revised as follows:

Table 2.5-9
Employment Trends 1995–2005

	Matagorda			Brazoria			Two-County Total			Texas		
	1995	2005	Ave. Annual Growth Percent	1995	2005	Ave. Annual Growth Percent	1995	2005	Ave. Annual Growth Percent	1995	2005	Ave. Annual Growth Percent
Labor Force	17,430	16,573	-0.5%	105,654	133,794	2.4%	123,084	150,367	2.0%	95,72,436	11,225,882	1.6%
Employment	14,921	15,209	0.2%	97,672	126,288	2.6%	112,593	141,497	2.3%	8,985,635	10,626,606	1.7%
Unemployment	2,506	1,364	-5.9%	7,982	7,506	-0.6%	10,488	8,870	-1.7%	586,801	896,276	0.2%
Unemployment Rate	14.4%	8.2%	—	7.6	5.6%	—	8.5%	5.9%	—	6.1%	5.3%	—

Source: Reference 2.5-12⁷

Question Number: 2.5-20**QUESTION:**

Provide data on all property tax collections, including a separation of STP payments.

Full Text (Supporting Information):

According to the ER, "Table 2.5-14 shows the total property taxes collected by the county, the total property taxes STPNOC has paid to Matagorda County, and the percent of the total county property taxes that are paid by STPNOC." However, the actual table only appears to show a breakdown of STP owner payments, not a comparison with total property taxation. Provide a comparison with total property taxation.

RESPONSE:

This table and another were inadvertently omitted. New tables 2.5-12a and 2.5-14a will be added to the ER. The new table 2.5-14a provides the information requested in the RAI.

CANDIDATE COLA REVISION:

The following new tables will be inserted into ER Section 2.5.

Table 2.5-12a Matagorda County Sales Tax Information

Year	Gross Sales	Amount Subject to State Tax	State Sales Tax Revenue
2002	\$483,026,125	\$175,279,285	\$10,954,955
2003	\$500,851,920	\$185,936,843	\$11,621,053
2004	\$531,471,630	\$186,179,857	\$11,636,241
2005	\$536,654,235	\$195,498,321	\$12,218,645
2006	\$587,615,882	\$220,073,158	\$13,754,572
2007	\$1,098,985,175	\$262,028,280	\$16,376,768

Source: Reference 2.5-101

Table 2.5-14a Matagorda County Property Tax Information, 2000-2005

Year	Total Taxable Value	Total County Levy	STP Payments to County [1]	STP Payments as % of Total [1]
2001	\$2,787,887,203	\$8,179,661	\$5,966,553	72.9%
2002	2,558,599,533	8,228,456	6,100,000	74.1%
2003	2,580,310,475	8,214,934	6,100,000	74.3%
2004	2,551,417,774	8,122,946	6,100,000	75.1%
2005	2,655,002,333	8,191,213	6,100,000	74.5%
2006	N/A	N/A	6,100,000	N/A

Sources: References 2.5-37 and 2.5-39.

[1] Reflects payments only to Matagorda County; does not include payments to the Hospital District or other special districts.

Question Number: 2.5-25

QUESTION:

Provide an explanation as to why maximum water treated exceeds rated capacity in Table 2.5-30.

Full Text (Supporting Information):

Provide an explanation of what it means to have maximum water treated exceed rated capacity of the system (several instances in Table 2.5–30).

RESPONSE:

When the Texas Commission on Environmental Quality issues permits for water treatment facilities, the rated capacity is based on an average over a period of time. Therefore, short-term usage can exceed the rated capacity.

CANDIDATE COLA REVISION:

Add to Section 2.5.2.7.1.2 [end of first paragraph]:

The TCEQ issues permits for water treatment facilities, with the rated capacity based on average usage over a period of time. Therefore, short-term usage may exceed the rated capacity.

Question Number: 2.5-26

QUESTION:

Determine whether the population forecasts in the TX Water Plan are consistent with those in the demographic section.

Full Text (Supporting Information):

Determine whether the population forecasts in the TX Water Plan are consistent with those in the demographic section. Region K grows by 92% from 2000 to 2040; but Matagorda County by 28%. Brazoria grows at the predicted rate for Region H through 2040.

RESPONSE:

Population forecasts in the TX Water Plan are not consistent with those discussed in the demographic section of the ER. As noted in Subsection 2.5.2.7.1.1, Matagorda County is one of 14 counties in Region K, which includes much faster growing and higher population entities such as Austin and nearby urban and suburban areas. Because of Matagorda County's lower population and slower growth rate, it would not have contributed substantially to the projected growth for Region K.

CANDIDATE COLA REVISION:

No COLA revision is required as a result of this response.

Question Number: 2.5-28**QUESTION:**

Reconcile employment numbers for major employers.

Full Text (Supporting Information):

Employment numbers in these two places are not consistent: The major employment facilities in the area, in addition to STP, include OXEA Corporation and Equistar Chemicals, LP. OXEA Corporation is located approximately five miles north-northeast of the plant and employs a total of 155 persons. Equistar, located about seven miles east of the STP site, employs 194 workers (STPNOC 2007b {FSAR Section 2.1S.3.3.1}).

The plant produces industrial chemicals and employs approximately 250 workers. The second employer is Lyondell Chemical (Equistar), located approximately seven miles east of the STP site, which produces polyethylene chemicals, and also employs approximately 250 workers.” (ER Section 2.5.2.1.). Reconcile these numbers.

RESPONSE:

The major employer’s employment numbers in Subsection 2.5.2.1 were obtained from a telephone interview with a local economic development official in Matagorda County, while the numbers in FSAR Section 2.1S.3.3.1 were obtained from a federal database used to support emergency response. The numbers in Subsection 2.5.2.1 and Table 2.5-8 will be changed to agree with the FSAR.

CANDIDATE COLA REVISION:

Section 2.5.2.1, 4th paragraph (p.2.5-8 of Rev. 01):

.... First, is the OXEA Corporation, formerly the Celanese Corporation (Bay City Plant), located approximately five miles north-northeast of the STP site. The plant produces industrial chemicals and employs approximately 250 155 workers. The second employer is Lyondell Chemical (Equistar), located approximately seven miles east of the STP site, which produces polyethylene chemicals, and employs approximately 250 194 workers.

Table 2.5-8:

Lyondell Chemical Company (Equistar)	Private	Chemical	250 155
OXEA Corporation – Advent International (Formerly Celanese)	Private	Chemical	250 194

Question Number: 3.7-1**QUESTION:**

Explain whether the replacement of transmission line towers would result in impacts outside existing transmission line corridors.

Full Text (Supporting Information):

ER Sections 3.7 and 4.3.1.1.3 indicate that two of the six existing transmission lines that run from the STP site to the Hillje substation in a single corridor will be upgraded over about 20 miles of their length. In the upgrades, the conductors of the two transmission lines and some of the transmission line towers will be replaced. The preamble to ER Section 2.2.2 indicates that neither new corridors nor expansion of existing corridors would be required for these upgrades. Although corridor expansion would not be required, explain whether the replacement of transmission line towers would impact areas outside the existing transmission corridor, such as via material laydown areas, new access roads, etc. If there would be impacts to areas outside the existing transmission corridor, what land cover types would be affected and what would be the aerial extent of impact?

RESPONSE:

It has been confirmed by American Electric Power (AEP), operator of the two transmission lines to be upgraded, that –

- The construction activities involved in the upgrades for conductors and partial rebuild of the existing 345 kV transmission towers will occur within the same footprint and will not involve disturbance of areas outside the existing transmission corridor. It is anticipated that the existing access roads will be sufficient to perform the rebuilds and that material laydown areas will be within the existing transmission corridor.
- The transmission line upgrades will result in an increase in height but not width of the transmission structures.
- The Constructor of the transmission line upgrades will comply with all the laws and environmental requirements associated with the transmission construction, maintaining the environmental integrity of the transmission corridor.

Therefore, the upgrade activities involving replacement of conductors of the two transmission lines and some of the associated transmission towers will not impact areas outside the existing transmission corridor. The environmental integrity of the areas within the existing transmission corridor will also be maintained during construction.

CANDIDATE COLA REVISION:

No COLA revision is required as a result of this response.

Question Number: 4.4-1**QUESTION:**

Add a month by month table of projected “workers on site”.

Full Text (Supporting Information):

Add a month by month table of projected “workers on site,” to include existing operating workforce, outage workers, construction workforce for units 3 and 4, operating workforce for units 3 and 4 in Section 3–10S. The table should include an operating period with Units 1, 2, 3 and 4 all operational, with and without an outage workforce.

RESPONSE:

The table shown below contains the requested information, which is also illustrated by the accompanying figure. This table and figure will be added to Section 3.10S of the ER.

CANDIDATE COLA REVISION:**Section 3.10S.3**

A study commissioned by DOE (Reference 3.10S-1) estimated the additional operations work force for a new ABWR unit constructed at an existing site. Applying the DOE study analysis to the operation of STP 3 & 4, it is estimated that the additional onsite operations workforce would be approximately 405 people per unit, with an additional nonoperational offsite support staff of 39 people per unit. The total required additional operations personnel for STP 3 & 4 (both units) would be 810 onsite and 78 offsite support staff, for a total of 888 people. Figure 3.10S-2 graphically depicts the operations workforce for Units 3 & 4, while Table 3.10S-3 and Figure 3.10S-3 depict the total STP site employment, including construction, operations, and outage workers for all four units. The operations staff for each unit would be put in place approximately two years before fuel load of the unit, to allow time for simulator training and startup testing. It is assumed the operations workforce would be recruited from outside the 50-mile radius.

Insert new Table 3.10S-3 and Figure 3.10S-3:

Table 3.10s-3. Total STP Workforce During Construction Period for Units 3 & 4, and 18 Months Beyond							
	Event ¹	Month	Unit 1 / 2 Staffing ²	Unit 3 / 4 Staffing ³	Construction Workforce ⁴	Outage Workforce ⁵	TOTAL Workforce
-24	Site Preparation Starts	-24	1350	99	100		1549
		-23	1353	107	200		1660
		-22	1356	116	300		1772
		-21	1359	124	400		1883
		-20	1362	133	500	45	2040
		-19	1364	142	600	310	2416
-18		-18	1367	150	700	1080	3297
	1RE15	-17	1367	159	800	1350	3676
		-16	1368	167	900	60	2495
		-15	1368	176	1000		2544
		-14	1368	184	1100	45	2698
		-13	1369	193	1200	310	3072
-12		-12	1369	202	1300	1080	3951
	2RE14	-11	1369	212	1400	1350	4331
		-10	1370	221	1500	60	3151
		-9	1370	230	1600		3200
	[2]	-8	1370	240	1700		3310
		-7	1371	249	1800		3420
-6		-6	1371	258	1900		3529
		-5	1368	268	2000		3636
		-4	1365	277	2100		3742
		-3	1362	286	2200		3848
		-2	1358	296	2300	35	3989
		-1	1355	305	2400	170	4230
COL	COL Issued/ Start Constr	1	1352	314	2500	850	5016
	1RE16	2	1349	322	2650	1100	5421
		3	1346	331	2800	60	4536
		4	1343	339	2950		4632
		5	1339	348	3100	35	4822
6		6	1336	356	3250	170	5112
		7	1333	365	3400	850	5948
	2RE15	8	1328	373	3550	1100	6351
		9	1324	382	3700	60	5465
		10	1319	390	3830		5539
		11	1315	399	3960		5673
12		12	1310	407	4090		5807
		13	1306	431	4220		5957
		14	1301	455	4350		6106
		15	1296	479	4480		6256
		16	1292	503	4610		6405

Table 3.10s-3: Total STP Workforce During Construction Period for Units 3 & 4, and 18 Months Beyond							
	Event ¹	Month	Unit 1 / 2 Staffing ²	Unit 3 / 4 Staffing ³	Construction Workforce ⁴	Outage Workforce ⁵	TOTAL Workforce
		17	1287	527	4740	35	6590
18		18	1283	552	4870	170	6874
		19	1278	576	5000	850	7704
	1RE17	20	1272	600	5130	1100	8102
		21	1267	624	5260	60	7210
		22	1261	648	5390		7299
		23	1255	672	5520	35	7482
24		24	1250	696	5650	170	7766
		25	1244	715	5800	850	8609
	2RE16	26	1238	733	5950	1100	9021
		27	1233	752	5950	60	7994
		28	1227	770	5950		7947
		29	1221	789	5950		7960
30		30	1216	807	5950		7973
		31	1210	826	5950		7986
		32	1204	844	5950		7998
		33	1199	863	5950		8011
		34	1193	881	5950		8024
		35	1187	900	5950	35	8072
36		36	1181	918	5850	170	8119
		37	1176	921	5750	850	8697
	1RE18	38	1170	925	5650	1100	8845
		39	1164	928	5450	60	7602
		40	1158	932	5250		7340
		41	1153	935	5050	35	7173
42		42	1147	939	4850	170	7105
		43	1141	942	4650	850	7583
	2RE17	44	1135	945	4450	1100	7630
	U3 Fuel Load	45	1128	949	4250	60	6387
		46	1122	952	4050		6124
		47	1115	956	3900		5971
48		48	1109	959	3800		5868
		49	1102	959	3700		5761
		50	1096	959	3600		5655
		51	1089	959	3500		5548
		52	1083	959	3400		5442
		53	1076	959	3300	35	5370
54	CO U3	54	1070	959	3200	170	5399
		55	1063	959	3000	850	5872
	1RE19	56	1063	959	2800	1100	5922
		57	1063	959	2600	60	4682
	U4 Fuel Load	58	1063	959	2400		4422
		59	1063	959	2200	35	4257

Table 3.10s-3. Total STP Workforce During Construction Period for Units 3 & 4, and 18 Months Beyond							
	Event ¹	Month	Unit 1 / 2 Staffing ²	Unit 3 / 4 Staffing ³	Construction Workforce ⁴	Outage Workforce ⁵	TOTAL Workforce
60		60	1063	959	2000	170	4192
		61	1062	959	1800	850	4671
	2RE18	62	1062	959	1600	1100	4721
		63	1062	959	1400	60	3481
		64	1062	959	1200		3221
		65	1062	959	1100		3121
66	U4 CO	66	1062	959	525		2546
		67	1062	959	0		2021
		68	1062	959	0		2021
		69	1062	959	0	35	2056
		70	1062	959	0	170	2191
		71	1062	959	0	885	2906
72	3RE01	72	1062	959	0	1270	3291
		73	1062	959	0	910	2931
	1RE20	74	1062	959	0	1100	3121
		75	1062	959	0	60	2081
		76	1062	959	0		2021
		77	1062	959	0	35	2056
78		78	1062	959	0	170	2191
		79	1062	959	0	850	2871
	2RE19	80	1062	959	0	1135	3156
		81	1062	959	0	230	2251
		82	1062	959	0	850	2871
	4RE01	83	1062	959	0	1100	3121
84		84	1062	959	0	60	2081
		85	1062	959	0		2021

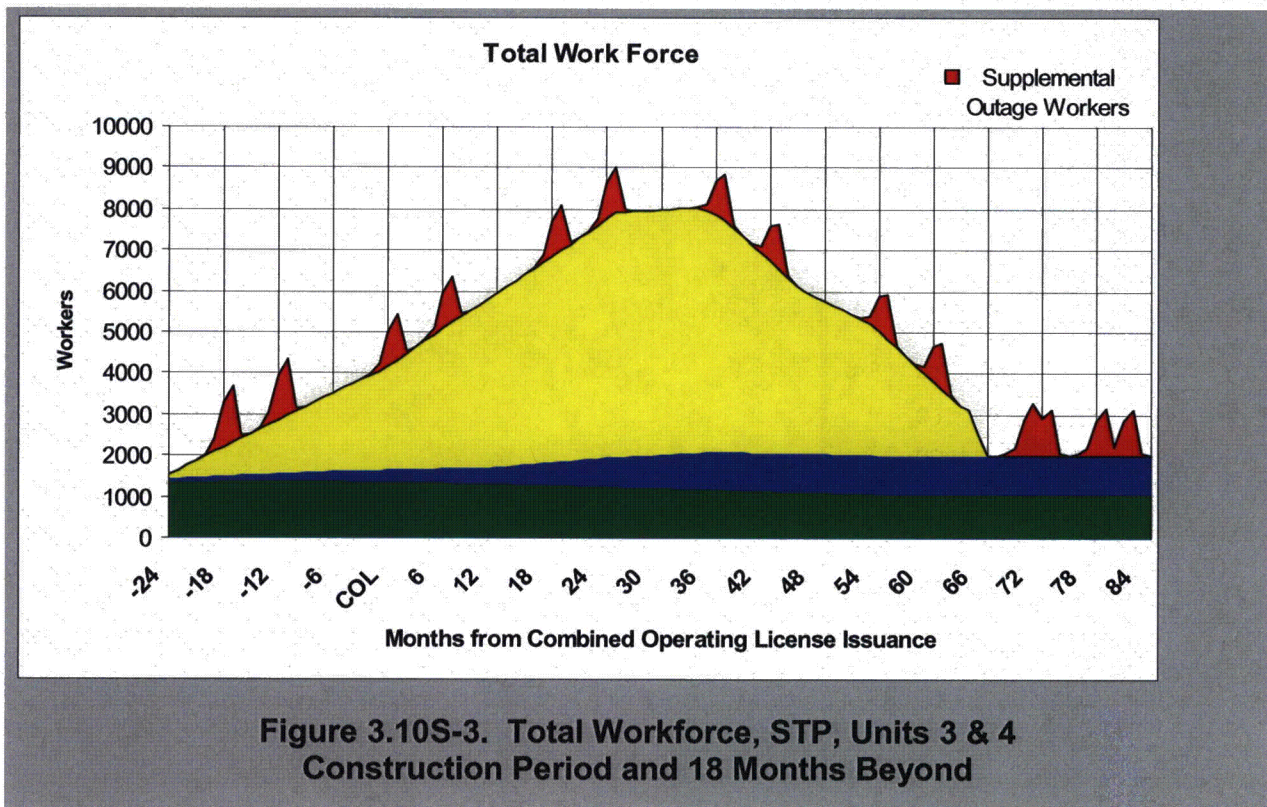
¹ Events at indicated months are from Table 3.3.10S-2, Environmental Report, Rev 01, 15 Jan 2008 and South Texas Project Long Range Outage Plan, Rev 4b, 10/15/07. Outages numbering convention: for example, for 1RE15, 1 = Unit 1 (or 2, 3 or 4); RE = refueling; 15 = this is the 15th refueling for Unit 1.

² Units 1/2 estimates are from STP Staffing Plan, June 2007

³ Units 3/4 estimates are from Owner's Estimate, 10/25/07

⁴ Construction Workforce estimates are from Table 3.3.10S-2, Environmental Report, Rev 01, 15 Jan 2008

⁵ Outage Supplemental Workforce estimates are based on South Texas Project 1RE14 Outage Report, 2008



Question Number: 4.4-2

QUESTION:

Reconcile construction-period employment assumptions.

Full Text (Supporting Information):

Reconcile the assumption in Section 4.4.2 that 50% of construction workers will live within the 50-mile commuting distance with the assumptions in Section 3.10S that less than 10% of the field craft labor and none of the non-field craft labor would come from within 50 miles. Also reconcile with the Section 3.10s statement that "Seventy to eighty percent of the construction workforce will be employed for more than four years. Most of the craft labor from outside the 50-mile radius will seek temporary housing, and most of the non-manual staff will relocate to the area and seek permanent housing."

RESPONSE:

The assumptions in Section 3.10S will be revised to conform to the assumptions in Section 4.4.2. The ER will be revised accordingly.

CANDIDATE COLA REVISION:

Revise ER Section 3.10S.1, third paragraph, as follows:

~~In order to bound the impact of an influx of workers into the plant vicinity, it is assumed that 50% 5% to 10% of the construction skilled-craft workforce would come from within a 50-mile radius of the STP site. The remainder of the construction craft labor work force is assumed to come from outside the 50-mile area. Nonmanual labor is assumed to come entirely from outside the 50-mile area.~~

Question Number: 4.4-4**QUESTION:**

Revise estimated impacts of post-construction job and income losses.

Full Text (Supporting Information):

The ER states that “however, after construction completion, a total of 50% of the movers would be expected to migrate back out of the 50-mile region.” At the end of the construction period, the entire income source of plant construction jobs goes away. This, rather than the specific workers, is the source of secondary impacts. Revise the post-construction impact to reflect the loss of the construction job income rather than the loss of the workers.

RESPONSE:

It is assumed that workers who remain in the ROI would move on to other jobs, and their presence in the ROI would continue to create indirect jobs. However, the income and employment effects would not be associated with construction of Units 3 & 4.

CANDIDATE COLA REVISION:

Section 4.4.2

Paragraph 4:

The employment of up to 2975 movers over a 7- to 8-year period could have SMALL to LARGE economic impacts on the surrounding region. The creation of these jobs could inject between \$67.6 and \$676 million dollars into the regional economy during the life of the construction project, reduce unemployment by up to 20%, and create business opportunities for housing and service-related industries. However, after construction completion, a total of 50% of the movers would be expected to migrate back out of the 50-mile region, and the income associated with construction of Units 3 & 4 would cease. The estimated economic impact of this out-migration could be as high as \$8,892,025 per month (during peak). These estimates are analyzed below.

Paragraph 7:

After construction is completed, approximately 50% of the movers would remain in the 50-mile radius and the remainder would migrate out. Assuming a 50% decrease in the mover labor force, there would be a corresponding decrease in the economic impact to the 50-mile region. Any movers remaining in the ROI would continue to contribute to economic impacts in the ROI, but these impacts would not be associated with STP 3 & 4 construction. As noted above, monthly earnings during construction peak total \$8,892,025 per month. With the earnings multiplier applied, impacts could be as high as \$13,383,038 in the unlikely case that all earnings were spent within the ROI. A 50% decrease in the mover labor force would reduce the monthly economic impact to the region by up to \$6,691,519, half of the monthly economic impact of the mover labor force during peak construction (if 100% of the earnings were spent within the region) (Table 4.4-5). This out-migration would be considered a negative impact. However, Figure 3.10-

1 indicates that the out-migration would occur gradually over a 2-year period. The gradual reduction in the construction labor force, and the in-migration of operations workers during the construction period, would assist in mitigating the impact to the community from the destabilizing effects of a sudden decrease in households.

Question Number: 4.4-5

QUESTION:

Further explain the land conversion assumption presented in Section 4.4.2 of the ER.

Full Text (Supporting Information):

Explain why 50% of the land converted for construction workers would return to its original use and 50% would remain converted.

RESPONSE:

It has been assumed that 50% of the construction movers would migrate out of the ROI upon completion of construction. Some of the movers would use “moveable housing” such as mobile homes, RVs, campers, and so on. Land used to park these vehicles could be returned to its original use with little effort. On the other hand, land converted to permanent construction of housing, retail, or other structures is not readily converted back to its original use.

CANDIDATE COLA REVISION:

Section 4.4.2.2.3, Conclusion, paragraph 2:

Upon construction completion, approximately 50% of the movers would migrate back out of the 50-mile region and 50% would become permanent residents. Residential and commercial activity would continue at a higher-than-preconstruction level. Approximately 50% of the converted land could remain converted and the balance of the converted land could return to its preconstruction use. Land that could readily be converted back to its original land could include, for example, open areas used to park mobile homes, RVs, campers, or similar vehicles used as temporary housing by some workers during construction.....

Question Number: 4.4-12

QUESTION:

Describe impacts of overlapping construction and operations workforces.

Since the operations and construction work forces overlap, what is the cumulative impact on housing, services, etc. during the late construction phase? Is it less than the maximum impact of construction, in view of the relative permanence of the operating work force?

RESPONSE:

In addition to the gradual nature of the decline in the construction workforce, the incoming operations workers and their families would help to mitigate the negative impacts of the decreasing construction workforce. Another mitigating factor would be the substantially higher average annual wages expected for the operations workers. These higher wages, combined with larger multipliers for both earnings and employment, suggest that each operations worker would have a greater impact on the ROI economy than each construction worker.

CANDIDATE COLA REVISION:

Section 4.4.2.2.1, add to end of Paragraph 7:

In addition to the gradual nature of the decline in the construction workforce, the incoming operations workers and their families would help to mitigate the negative impacts of the decreasing construction workforce. Another mitigating factor would be the substantially higher average annual wages expected for the operations workers. These higher wages, combined with larger multipliers for both earnings and employment, suggest that each operations worker would have a greater impact on the ROI economy than each construction worker.

Question Number: 4.4-18

QUESTION:

Provide a copy of RIMS II multipliers used.

Full Text (Supporting Information):

Provide a copy of "RIMS II Multipliers for Matagorda and Brazoria Counties, Texas," BEA (U.S. Bureau of Economic Analysis), U. S. Department of Commerce. Economic and Statistics Administration. Bureau of Economic Analysis, Washington, D.C. February 2, 2007.

RESPONSE:

The tables are attached.

CANDIDATE COLA REVISION:

No COLA revision is required as a result of this response.

RIMS II Multipliers (1997/2004)
Table 1.4 Total Multipliers for Output, Earnings, and Employment by
Detailed Industry Matagorda and Brazoria Counties, TX

INDUSTRY	Multiplier				
	Final Demand			Direct Effect	
	Output/1/ (dollars)	Earnings/2/ (dollars)	Employment/3/ (jobs)	Earnings/4/ (dollars)	Employment/5/ (jobs)
1111A0 Oilseed farming	1.4377	0.1805	9.4624	1.9279	1.4582
1111B0 Grain farming	1.5543	0.1985	9.7694	2.1756	1.6874
111200 Vegetable and melon farming	1.4081	0.2505	18.0760	1.6006	1.2400
1113A0 Fruit farming	1.5170	0.3282	26.4474	1.6002	1.2182
111335 Tree nut farming	1.5225	0.3482	22.8838	1.5679	1.2791
111400 Greenhouse and nursery production	1.4084	0.3525	21.1077	1.3636	1.2093
111910 Tobacco farming	1.0000	0.0000	0.0000	0.0000	0.0000
111920 Cotton farming	1.7241	0.2956	15.8118	2.4116	1.8237
1119A0 Sugarcane and sugar beet farming	1.0000	0.0000	0.0000	0.0000	0.0000
1119B0 All other crop farming	1.4469	0.1902	10.9547	1.9768	1.4269
112100 Cattle ranching and farming	2.0232	0.2479	11.8966	2.7170	2.1495
112300 Poultry and egg production	1.7676	0.2070	8.5215	2.2581	1.7530
112A00 Animal production, except cattle and poultry and eggs	1.9815	0.2391	11.1960	2.6207	1.9651
113A00 Forest nurseries, forest products, and timber tracts	1.0000	0.0000	0.0000	0.0000	0.0000
113300 Logging	1.0000	0.0000	0.0000	0.0000	0.0000
114100 Fishing	1.6603	0.4268	25.6384	1.5351	1.1991
114200 Hunting and trapping	1.6497	0.2842	14.7888	2.7979	2.4184
115000 Agriculture and forestry support activities	1.7371	0.5569	27.8205	1.3915	1.2595
211000 Oil and gas extraction	1.4650	0.2510	3.7164	1.5607	2.4107
212100 Coal mining	1.0000	0.0000	0.0000	0.0000	0.0000
212210 Iron ore mining	1.0000	0.0000	0.0000	0.0000	0.0000
212230 Copper, nickel, lead, and zinc mining	1.0000	0.0000	0.0000	0.0000	0.0000
2122A0 Gold, silver, and other metal ore mining	1.0000	0.0000	0.0000	0.0000	0.0000
212310 Stone mining and quarrying	1.4162	0.2504	5.3371	1.5303	1.8241
212320 Sand, gravel, clay, and refractory mining	1.4548	0.2678	5.6784	1.5292	1.8016
212390 Other nonmetallic mineral mining	1.0000	0.0000	0.0000	0.0000	0.0000
213111 Drilling oil and gas wells	1.4236	0.2123	4.8000	1.6496	1.9028
213112 Support activities for oil and gas operations	1.3936	0.2816	5.6106	1.4404	1.7978
21311A Support activities for other mining	1.0000	0.0000	0.0000	0.0000	0.0000
2211A0 Power generation and supply	1.4320	0.2720	4.5053	1.5639	2.4749
221200 Natural gas distribution	1.9443	0.3054	4.9301	2.5623	3.7619
221300 Water, sewage and other systems	1.4815	0.3441	8.5876	1.5254	1.7133
230000 Construction	1.6504	0.4596	12.7047	1.4981	1.6073
311111 Dog and cat food manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
311119 Other animal food manufacturing	1.6992	0.1813	5.8358	2.7954	3.1824
311211 Flour milling	1.0000	0.0000	0.0000	0.0000	0.0000
311212 Rice milling	2.0119	0.2299	7.6886	3.5442	5.1006
311213 Malt manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
311221 Wet corn milling	1.0000	0.0000	0.0000	0.0000	0.0000
311222 Soybean processing	1.0000	0.0000	0.0000	0.0000	0.0000
311223 Other oilseed processing	1.0000	0.0000	0.0000	0.0000	0.0000
311225 Fats and oils refining and blending	1.0000	0.0000	0.0000	0.0000	0.0000

RIMS II Multipliers (1997/2004)
Table 1.4 Total Multipliers for Output, Earnings, and Employment by
Detailed Industry Matagorda and Brazoria Counties, TX (Continued)

INDUSTRY	Multiplier				
	Final Demand			Direct Effect	
	Output/1/ (dollars)	Earnings/2/ (dollars)	Employment/3/ (jobs)	Earnings/4/ (dollars)	Employment/5/ (jobs)
311230 Breakfast cereal manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
311310 Sugar manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
311320 Confectionery manufacturing from cacao beans	1.0000	0.0000	0.0000	0.0000	0.0000
311330 Confectionery manufacturing from purchased chocolate	1.0000	0.0000	0.0000	0.0000	0.0000
311340 Nonchocolate confectionery manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
311410 Frozen food manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
311420 Fruit and vegetable canning and drying	1.0000	0.0000	0.0000	0.0000	0.0000
311511 Fluid milk manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
311512 Creamery butter manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
311513 Cheese manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
311514 Dry, condensed, and evaporated dairy products	1.0000	0.0000	0.0000	0.0000	0.0000
311520 Ice cream and frozen dessert manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
311611 Animal, except poultry, slaughtering	2.3872	0.2487	10.3426	3.8351	4.9654
311612 Meat processed from carcasses	1.0000	0.0000	0.0000	0.0000	0.0000
311613 Rendering and meat byproduct processing	1.0000	0.0000	0.0000	0.0000	0.0000
311615 Poultry processing	1.0000	0.0000	0.0000	0.0000	0.0000
311700 Seafood product preparation and packaging	1.4450	0.1883	7.5861	1.9860	1.8237
31181A Bread and bakery product, except frozen, manufacturing	1.2832	0.2297	7.0588	1.3842	1.4212
311813 Frozen cakes and other pastries manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
311821 Cookie and cracker manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
311822 Mixes and dough made from purchased flour	1.0000	0.0000	0.0000	0.0000	0.0000
311823 Dry pasta manufacturing	1.2348	0.1223	4.3040	1.7786	1.5636
311830 Tortilla manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
311911 Roasted nuts and peanut butter manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
311919 Other snack food manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
311920 Coffee and tea manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
311930 Flavoring syrup and concentrate manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
311941 Mayonnaisse, dressing, and sauce manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
311942 Spice and extract manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
311990 All other food manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
312110 Soft drink and ice manufacturing	1.2221	0.1361	2.8881	1.6059	2.0861
312120 Breweries	1.0000	0.0000	0.0000	0.0000	0.0000
312130 Wineries	1.0000	0.0000	0.0000	0.0000	0.0000
312140 Distilleries	1.0000	0.0000	0.0000	0.0000	0.0000
312210 Tobacco stemming and redrying	1.0000	0.0000	0.0000	0.0000	0.0000
312221 Cigarette manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
312229 Other tobacco product manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
313100 Fiber, yarn, and thread mills	1.0000	0.0000	0.0000	0.0000	0.0000
313210 Broadwoven fabric mills	1.0000	0.0000	0.0000	0.0000	0.0000
313220 Narrow fabric mills and schiffli embroidery	1.0000	0.0000	0.0000	0.0000	0.0000
313230 Nonwoven fabric mills	1.0000	0.0000	0.0000	0.0000	0.0000
313240 Knit fabric mills	1.0000	0.0000	0.0000	0.0000	0.0000

RIMS II Multipliers (1997/2004)
Table 1.4 Total Multipliers for Output, Earnings, and Employment by
Detailed Industry Matagorda and Brazoria Counties, TX (Continued)

INDUSTRY	Multiplier				
	Final Demand			Direct Effect	
	Output/1/ (dollars)	Earnings/2/ (dollars)	Employment/3/ (jobs)	Earnings/4/ (dollars)	Employment/5/ (jobs)
313310 Textile and fabric finishing mills	1.0000	0.0000	0.0000	0.0000	0.0000
313320 Fabric coating mills	1.0000	0.0000	0.0000	0.0000	0.0000
314110 Carpet and rug mills	1.0000	0.0000	0.0000	0.0000	0.0000
314120 Curtain and linen mills	1.2150	0.1355	5.0583	1.5577	1.4031
314910 Textile bag and canvas mills	1.0000	0.0000	0.0000	0.0000	0.0000
314992 Tire cord and tire fabric mills	1.0000	0.0000	0.0000	0.0000	0.0000
31499A Other miscellaneous textile product mills	1.3219	0.1877	6.8725	1.5742	1.4208
315111 Sheer hosiery mills	1.0000	0.0000	0.0000	0.0000	0.0000
315119 Other hosiery and sock mills	1.0000	0.0000	0.0000	0.0000	0.0000
315190 Other apparel knitting mills	1.0000	0.0000	0.0000	0.0000	0.0000
315200 Cut and sew apparel manufacturing	1.2536	0.2169	7.5972	1.3693	1.3262
315900 Accessories and other apparel manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
316100 Leather and hide tanning and finishing	1.0000	0.0000	0.0000	0.0000	0.0000
316200 Footwear manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
316900 Other leather product manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
321113 Sawmills	1.0000	0.0000	0.0000	0.0000	0.0000
321114 Wood preservation	1.0000	0.0000	0.0000	0.0000	0.0000
32121A Veneer and plywood manufacturing	1.4029	0.2493	6.1827	1.5454	1.7188
32121B Engineered wood member and truss manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
321219 Reconstituted wood product manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
321911 Wood windows and door manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
321912 Cut stock, resawing lumber, and planing	1.0000	0.0000	0.0000	0.0000	0.0000
321918 Other millwork, including flooring	1.3411	0.2635	7.8787	1.4299	1.4446
321920 Wood container and pallet manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
321991 Manufactured home, mobile home, manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
321992 Prefabricated wood building manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
321999 Miscellaneous wood product manufacturing	1.3882	0.3146	10.5636	1.3917	1.3464
322110 Pulp mills	1.0000	0.0000	0.0000	0.0000	0.0000
3221A0 Paper and paperboard mills	1.0000	0.0000	0.0000	0.0000	0.0000
322210 Paperboard container manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
32222A Coated and laminated paper and packaging materials	1.0000	0.0000	0.0000	0.0000	0.0000
32222B Coated and uncoated paper bag manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
322225 Flexible packaging foil manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
322226 Surface-coated paperboard manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
322231 Die-cut paper office supplies manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
322232 Envelope manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
322233 Stationery and related product manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
322291 Sanitary paper product manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
322299 All other converted paper product manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
32311A Commercial printing	1.3458	0.2855	7.3604	1.3889	1.5059
323116 Manifold business forms printing	1.2856	0.2061	4.8840	1.4889	1.7479
323117 Books printing	1.0000	0.0000	0.0000	0.0000	0.0000

RIMS II Multipliers (1997/2004)
Table 1.4 Total Multipliers for Output, Earnings, and Employment by
Detailed Industry Matagorda and Brazoria Counties, TX (Continued)

INDUSTRY	Multiplier				
	Final Demand			Direct Effect	
	Output/1/ (dollars)	Earnings/2/ (dollars)	Employment/3/ (jobs)	Earnings/4/ (dollars)	Employment/5/ (jobs)
323118 Blankbook and looseleaf binder manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
323121 Tradebinding and related work	1.3990	0.3881	12.7054	1.3157	1.3169
323122 Prepress services	1.0000	0.0000	0.0000	0.0000	0.0000
324110 Petroleum refineries	1.7450	0.2212	3.2840	2.6040	5.5693
324121 Asphalt paving mixture and block manufacturing	2.0723	0.2969	5.6026	2.6085	3.5242
324122 Asphalt shingle and coating materials manufacturing	1.6750	0.3561	6.0073	1.5586	2.2437
324191 Petroleum lubricating oil and grease manufacturing	1.8026	0.3028	5.4673	1.8540	2.4406
324199 All other petroleum and coal products manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
325110 Petrochemical manufacturing	1.9579	0.2461	4.1029	2.7771	5.5310
325120 Industrial gas manufacturing	1.4369	0.2111	3.5137	1.8184	3.0001
325130 Synthetic dye and pigment manufacturing	1.5512	0.2381	4.1337	1.8195	2.8178
325180 Other basic inorganic chemical manufacturing	1.5116	0.2367	4.0127	1.8214	3.1073
325190 Other basic organic chemical manufacturing	1.8876	0.2469	4.4790	2.5933	4.2523
325211 Plastics material and resin manufacturing	2.0145	0.2482	4.4086	2.8012	4.4527
325212 Synthetic rubber manufacturing	1.8386	0.2457	4.5574	2.2563	3.0755
325221 Cellulosic organic fiber manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
325222 Noncellulosic organic fiber manufacturing	1.8297	0.2674	6.2536	2.1191	2.1415
325311 Nitrogenous fertilizer manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
325312 Phosphatic fertilizer manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
325314 Fertilizer, mixing only, manufacturing	1.4316	0.1729	4.0892	1.9508	2.1748
325320 Pesticide and other agricultural chemical manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
325400 Pharmaceutical and medicine manufacturing	1.3115	0.1826	3.1143	1.5455	2.3870
325510 Paint and coating manufacturing	1.7108	0.2394	4.6755	2.0300	2.6270
325520 Adhesive manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
325611 Soap and other detergent manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
325612 Polish and other sanitation good manufacturing	1.3726	0.1722	3.3569	1.7367	2.3954
325613 Surface active agent manufacturing	1.8439	0.2425	5.2695	2.3230	2.6125
325620 Toilet preparation manufacturing	1.3092	0.1571	3.2068	1.6766	2.2437
325910 Printing ink manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
325920 Explosives manufacturing	1.4722	0.3627	6.1849	1.4217	2.0049
325991 Custom compounding of purchased resins	1.0000	0.0000	0.0000	0.0000	0.0000
325992 Photographic film and chemical manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
325998 Other miscellaneous chemical product manufacturing	1.6279	0.2395	4.3697	1.9378	2.8798
326110 Plastics packaging materials, film and sheet	1.0000	0.0000	0.0000	0.0000	0.0000
326120 Plastics pipe, fittings, and profile shapes	1.8876	0.2815	6.6649	2.0716	2.0853
326130 Laminated plastics plate, sheet, and shapes	1.0000	0.0000	0.0000	0.0000	0.0000
3261A0 Foam product manufacturing	1.6933	0.2546	6.2181	1.8685	1.8901
326160 Plastics bottle manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
326192 Resilient floor covering manufacturing	1.5774	0.2278	5.2515	1.7959	1.9328
32619A Plastics plumbing fixtures and all other plastics products	1.6658	0.3101	8.4264	1.6229	1.5912
326210 Tire manufacturing	1.6032	0.2776	5.9547	1.6714	2.0106
326220 Rubber and plastics hose and belting manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000

RIMS II Multipliers (1997/2004)
Table 1.4 Total Multipliers for Output, Earnings, and Employment by
Detailed Industry Matagorda and Brazoria Counties, TX (Continued)

INDUSTRY	Multiplier				
	Final Demand			Direct Effect	
	Output/1/ (dollars)	Earnings/2/ (dollars)	Employment/3/ (jobs)	Earnings/4/ (dollars)	Employment/5/ (jobs)
326290 Other rubber product manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
327111 Vitreous china plumbing fixture manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
327112 Vitreous china and earthenware articles manufacturing	1.4712	0.3397	11.0944	1.4484	1.4031
327113 Porcelain electrical supply manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
327121 Brick and structural clay tile manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
327122 Ceramic wall and floor tile manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
32712A Clay refractory and other structural clay products	1.0000	0.0000	0.0000	0.0000	0.0000
327125 Nonclay refractory manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
327213 Glass container manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
32721A Glass and glass products, except glass containers	1.0000	0.0000	0.0000	0.0000	0.0000
327310 Cement manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
327320 Ready-mix concrete manufacturing	1.5245	0.2478	5.9096	1.8491	2.1817
327331 Concrete block and brick manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
327332 Concrete pipe manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
327390 Other concrete product manufacturing	1.4678	0.2970	8.0141	1.5112	1.5935
327410 Lime manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
327420 Gypsum product manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
327910 Abrasive product manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
327991 Cut stone and stone product manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
327992 Ground or treated minerals and earths manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
327993 Mineral wool manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
327999 Miscellaneous nonmetallic mineral products	1.4623	0.2380	6.8477	1.6703	1.6421
331111 Iron and steel mills	1.3918	0.1231	2.7140	3.2043	4.9462
331112 Ferroalloy and related product manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
331210 Iron, steel pipe and tube from purchased steel	1.0000	0.0000	0.0000	0.0000	0.0000
331221 Rolled steel shape manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
331222 Steel wire drawing	1.0000	0.0000	0.0000	0.0000	0.0000
331311 Alumina refining	1.0000	0.0000	0.0000	0.0000	0.0000
331312 Primary aluminum production	1.4870	0.1269	2.6105	3.7452	5.7040
331314 Secondary smelting and alloying of aluminum	1.0000	0.0000	0.0000	0.0000	0.0000
331315 Aluminum sheet, plate, and foil manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
331316 Aluminum extruded product manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
331319 Other aluminum rolling and drawing	1.0000	0.0000	0.0000	0.0000	0.0000
331411 Primary smelting and refining of copper	1.0000	0.0000	0.0000	0.0000	0.0000
331419 Primary nonferrous metal, except copper and aluminum	1.3331	0.1035	2.0839	2.9996	5.6857
331421 Copper rolling, drawing, and extruding	1.0000	0.0000	0.0000	0.0000	0.0000
331422 Copper wire, except mechanical, drawing	1.0000	0.0000	0.0000	0.0000	0.0000
331423 Secondary processing of copper	1.0000	0.0000	0.0000	0.0000	0.0000
331491 Nonferrous metal, except copper and aluminum, shaping	1.0000	0.0000	0.0000	0.0000	0.0000
331492 Secondary processing of other nonferrous	1.0000	0.0000	0.0000	0.0000	0.0000
331510 Ferrous metal foundries	1.0000	0.0000	0.0000	0.0000	0.0000
33152A Aluminum foundries	1.0000	0.0000	0.0000	0.0000	0.0000

RIMS II Multipliers (1997/2004)
Table 1.4 Total Multipliers for Output, Earnings, and Employment by
Detailed Industry Matagorda and Brazoria Counties, TX (Continued)

INDUSTRY	Multiplier				
	Final Demand			Direct Effect	
	Output/1/ (dollars)	Earnings/2/ (dollars)	Employment/3/ (jobs)	Earnings/4/ (dollars)	Employment/5/ (jobs)
33152B Nonferrous foundries, except aluminum	1.0000	0.0000	0.0000	0.0000	0.0000
332111 Iron and steel forging	1.0000	0.0000	0.0000	0.0000	0.0000
332112 Nonferrous forging	1.0000	0.0000	0.0000	0.0000	0.0000
332114 Custom roll forming	1.0000	0.0000	0.0000	0.0000	0.0000
33211A All other forging and stamping	1.0000	0.0000	0.0000	0.0000	0.0000
332211 Cutlery and flatware, except precious, manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
332212 Hand and edge tool manufacturing	1.3743	0.2926	7.9074	1.3984	1.4699
332213 Saw blade and handsaw manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
332214 Kitchen utensil, pot, and pan manufacturing	1.3327	0.2122	6.2412	1.5180	1.5289
332311 Prefabricated metal buildings and components	1.4656	0.2468	6.0107	1.6070	1.7868
332312 Fabricated structural metal manufacturing	1.4450	0.2416	5.7725	1.5738	1.7740
332313 Plate work manufacturing	1.3915	0.3095	7.3520	1.3735	1.5407
332321 Metal window and door manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
332322 Sheet metal work manufacturing	1.3690	0.2841	7.5466	1.3746	1.4514
332323 Ornamental and architectural metal work manufacturing	1.4156	0.2827	8.3575	1.4405	1.4478
332410 Power boiler and heat exchanger manufacturing	1.3724	0.2793	6.1170	1.4019	1.6545
332420 Metal tank, heavy gauge, manufacturing	1.4249	0.2820	7.2563	1.4649	1.5707
332430 Metal can, box, and other container manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
33299A Ammunition manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
332994 Small arms manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
332995 Other ordnance and accessories manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
332500 Hardware manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
332600 Spring and wire product manufacturing	1.3856	0.2705	7.0626	1.4457	1.5565
332710 Machine shops	1.4413	0.3874	9.6156	1.3695	1.5057
332720 Turned product and screw, nut, and bolt manufacturing	1.3703	0.3102	7.5387	1.3724	1.5318
332811 Metal heat treating	1.0000	0.0000	0.0000	0.0000	0.0000
332812 Metal coating and nonprecious engraving	1.4778	0.2452	6.4469	1.5937	1.6415
332813 Electroplating, anodizing, and coloring metal	1.5011	0.3860	10.6416	1.3857	1.4339
332910 Metal valve manufacturing	1.2871	0.2274	4.8813	1.4009	1.6873
332991 Ball and roller bearing manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
332996 Fabricated pipe and pipe fitting manufacturing	1.3707	0.2497	5.9115	1.4552	1.6447
332997 Industrial pattern manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
332998 Enameled iron and metal sanitary ware manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
332999 Miscellaneous fabricated metal product manufacturing	1.3935	0.2637	6.4909	1.4556	1.6063
333111 Farm machinery and equipment manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
333112 Lawn and garden equipment manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
333120 Construction machinery manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
333131 Mining machinery and equipment manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
333132 Oil and gas field machinery and equipment	1.3234	0.1788	3.2941	1.6675	2.5180
333210 Sawmill and woodworking machinery	1.0000	0.0000	0.0000	0.0000	0.0000
333220 Plastics and rubber industry machinery	1.0000	0.0000	0.0000	0.0000	0.0000
333291 Paper industry machinery manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000

RIMS II Multipliers (1997/2004)
Table 1.4 Total Multipliers for Output, Earnings, and Employment by
Detailed Industry Matagorda and Brazoria Counties, TX (Continued)

INDUSTRY	Multiplier				
	Final Demand			Direct Effect	
	Output/1/ (dollars)	Earnings/2/ (dollars)	Employment/3/ (jobs)	Earnings/4/ (dollars)	Employment/5/ (jobs)
333292 Textile machinery manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
333293 Printing machinery and equipment manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
333294 Food product machinery manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
333295 Semiconductor machinery manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
333298 All other industrial machinery manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
33331A Automatic vending, commercial laundry and drycleaning machinery	1.0000	0.0000	0.0000	0.0000	0.0000
333313 Office machinery manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
333314 Optical instrument and lens manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
333315 Photographic and photocopying equipment manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
333319 Other commercial and service industry machinery manufacturing	1.3885	0.2068	4.5599	1.6257	1.9340
333411 Air purification equipment manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
333412 Industrial and commercial fan and blower manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
333414 Heating equipment, except warm air furnaces	1.0000	0.0000	0.0000	0.0000	0.0000
333415 AC, refrigeration, and forced air heating	1.2953	0.1625	3.6203	1.6906	2.0709
333511 Industrial mold manufacturing	1.3626	0.3203	8.1833	1.3528	1.4741
333512 Metal cutting machine tool manufacturing	1.3287	0.2197	5.2998	1.5255	1.7150
333513 Metal forming machine tool manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
333514 Special tool, die, jig, and fixture manufacturing	1.3460	0.3058	7.4022	1.3567	1.5150
333515 Cutting tool and machine tool accessory manufacturing	1.3263	0.2562	5.7836	1.4148	1.6625
33351A Rolling mill and other metalworking machinery	1.0000	0.0000	0.0000	0.0000	0.0000
333611 Turbine and turbine generator set units manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
33361A Speed changers and mechanical power transmission equipment	1.0000	0.0000	0.0000	0.0000	0.0000
333618 Other engine equipment manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
333911 Pump and pumping equipment manufacturing	1.2991	0.1916	3.9854	1.5394	1.9585
333912 Air and gas compressor manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
333913 Measuring and dispensing pump manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
333921 Elevator and moving stairway manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
333922 Conveyor and conveying equipment manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
333923 Overhead cranes, hoists, and monorail systems	1.0000	0.0000	0.0000	0.0000	0.0000
333924 Industrial truck, trailer, and stacker manufacturing	1.3196	0.1689	3.8329	1.7136	2.0440
333991 Power-driven handtool manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
333992 Welding and soldering equipment manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
333993 Packaging machinery manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
333994 Industrial process furnace and oven manufacturing	1.2768	0.1978	4.9030	1.4563	1.6020
333995 Fluid power cylinder and actuator manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
333996 Fluid power pump and motor manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
33399A Scales, balances, and miscellaneous general purpose machinery	1.3274	0.2154	4.9117	1.4984	1.7465
334111 Electronic computer manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
334112 Computer storage device manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
334113 Computer terminal manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
334119 Other computer peripheral equipment manufacturing	1.4195	0.2217	4.2645	1.6917	2.2869
334210 Telephone apparatus manufacturing	1.2673	0.1573	2.5568	1.5878	2.8156

RIMS II Multipliers (1997/2004)
Table 1.4 Total Multipliers for Output, Earnings, and Employment by
Detailed Industry Matagorda and Brazoria Counties, TX (Continued)

INDUSTRY	Multiplier				
	Final Demand			Direct Effect	
	Output/1/ (dollars)	Earnings/2/ (dollars)	Employment/3/ (jobs)	Earnings/4/ (dollars)	Employment/5/ (jobs)
334220 Broadcast and wireless communications equipment	1.0000	0.0000	0.0000	0.0000	0.0000
334290 Other communications equipment manufacturing	1.3573	0.2368	4.3762	1.5032	2.0902
334300 Audio and video equipment manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
334411 Electron tube manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
334413 Semiconductors and related device manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
33441A All other electronic component manufacturing	1.3757	0.2250	5.0211	1.5529	1.8194
334510 Electromedical apparatus manufacturing	1.3484	0.2436	4.3070	1.4624	2.0990
334511 Search, detection, and navigation instruments	1.0000	0.0000	0.0000	0.0000	0.0000
334512 Automatic environmental control manufacturing	1.3298	0.2394	5.7513	1.4457	1.6105
334513 Industrial process variable instruments	1.3484	0.2636	5.1113	1.4255	1.8493
334514 Totalizing fluid meters and counting devices	1.0000	0.0000	0.0000	0.0000	0.0000
334515 Electricity and signal testing instruments	1.0000	0.0000	0.0000	0.0000	0.0000
334516 Analytical laboratory instrument manufacturing	1.3504	0.2662	4.9262	1.4320	2.0253
334517 Irradiation apparatus manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
33451A Watch, clock, and other measuring and controlling device manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
334611 Software reproducing	1.0000	0.0000	0.0000	0.0000	0.0000
334612 Audio and video media reproduction	1.0000	0.0000	0.0000	0.0000	0.0000
334613 Magnetic and optical recording media manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
335110 Electric lamp bulb and part manufacturing	1.3119	0.2000	3.7490	1.5194	2.0691
335120 Lighting fixture manufacturing	1.3465	0.2087	4.8320	1.5858	1.8528
335211 Electric housewares and household fan manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
335212 Household vacuum cleaner manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
335221 Household cooking appliance manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
335222 Household refrigerator and home freezer manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
335224 Household laundry equipment manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
335228 Other major household appliance manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
335311 Electric power and specialty transformer manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
335312 Motor and generator manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
335313 Switchgear and switchboard apparatus manufacturing	1.2928	0.2093	4.1692	1.4586	1.8617
335314 Relay and industrial control manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
335911 Storage battery manufacturing	1.4281	0.2175	4.9159	1.6544	1.9363
335912 Primary battery manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
335921 Fiber optic cable manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
335929 Other communication and energy wire manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
335930 Wiring device manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
335991 Carbon and graphite product manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
335999 Miscellaneous electrical equipment manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
336110 Automobile and light truck manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
336120 Heavy duty truck manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
336211 Motor vehicle body manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
336212 Truck trailer manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000

RIMS II Multipliers (1997/2004)
Table 1.4 Total Multipliers for Output, Earnings, and Employment by
Detailed Industry Matagorda and Brazoria Counties, TX (Continued)

INDUSTRY	Multiplier				
	Final Demand			Direct Effect	
	Output/1/ (dollars)	Earnings/2/ (dollars)	Employment/3/ (jobs)	Earnings/4/ (dollars)	Employment/5/ (jobs)
336213 Motor home manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
336214 Travel trailer and camper manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
336300 Motor vehicle parts manufacturing	1.3436	0.2160	4.7938	1.5493	1.8527
336411 Aircraft manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
336412 Aircraft engine and engine parts manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
336413 Other aircraft parts and equipment	1.0000	0.0000	0.0000	0.0000	0.0000
336414 Guided missile and space vehicle manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
33641A Propulsion units and parts for space vehicles and guided missiles	1.0000	0.0000	0.0000	0.0000	0.0000
336500 Railroad rolling stock manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
336611 Ship building and repairing	1.4795	0.3466	8.1911	1.4171	1.5979
336612 Boat building	1.3787	0.2217	5.8395	1.5270	1.5995
336991 Motorcycle, bicycle, and parts manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
336992 Military armored vehicles and tank parts manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
336999 All other transportation equipment manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
337110 Wood kitchen cabinet and countertop manufacturing	1.3715	0.3042	9.9907	1.3802	1.3567
337121 Upholstered household furniture manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
337122 Nonupholstered wood household furniture manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
337124 Metal household furniture manufacturing	1.3311	0.2606	8.5796	1.3864	1.3600
337127 Institutional furniture manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
33712A Other household and institutional furniture	1.0000	0.0000	0.0000	0.0000	0.0000
337211 Wood office furniture manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
337212 Custom architectural woodwork and millwork	1.3947	0.3773	10.9655	1.3024	1.3469
337214 Office furniture, except wood, manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
337215 Showcases, partitions, shelving, and lockers	1.0000	0.0000	0.0000	0.0000	0.0000
337910 Mattress manufacturing	1.4490	0.2320	6.9840	1.7029	1.6778
337920 Blind and shade manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
339111 Laboratory apparatus and furniture manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
339112 Surgical and medical instrument manufacturing	1.3911	0.2926	5.0957	1.4265	1.9799
339113 Surgical appliance and supplies manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
339114 Dental equipment and supplies manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
339115 Ophthalmic goods manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
339116 Dental laboratories	1.4343	0.4008	9.2080	1.3183	1.4771
339910 Jewelry and silverware manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
339920 Sporting and athletic goods manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
339930 Doll, toy, and game manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
339940 Office supplies, except paper, manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
339950 Sign manufacturing	1.4407	0.3627	7.9658	1.3632	1.6081
339991 Gasket, packing, and sealing device manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
339992 Musical instrument manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
339994 Broom, brush, and mop manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
339995 Burial casket manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000
33999A Buttons, pins, and all other miscellaneous manufacturing	1.4226	0.2899	6.6664	1.4486	1.6737

RIMS II Multipliers (1997/2004)
Table 1.4 Total Multipliers for Output, Earnings, and Employment by
Detailed Industry Matagorda and Brazoria Counties, TX (Continued)

INDUSTRY	Multiplier				
	Final Demand			Direct Effect	
	Output/1/ (dollars)	Earnings/2/ (dollars)	Employment/3/ (jobs)	Earnings/4/ (dollars)	Employment/5/ (jobs)
420000 Wholesale trade	1.3509	0.3244	7.0311	1.3602	1.7196
4A0000 Retail trade	1.3853	0.3593	14.3872	1.3432	1.2773
481000 Air transportation	1.5263	0.2231	5.5079	2.1486	3.3532
482000 Rail transportation	1.5366	0.3801	7.0315	1.4745	2.0105
483000 Water transportation	1.0000	0.0000	0.0000	0.0000	0.0000
484000 Truck transportation	1.6403	0.3794	11.4340	1.6260	1.6328
485A00 Transit and ground passenger transportation	1.6588	0.5453	25.9659	1.3641	1.1999
486000 Pipeline transportation	1.8117	0.3995	6.9268	1.8402	3.7280
48A000 Scenic and sightseeing transportation and support activities for transportation	1.5545	0.4072	9.2319	1.5146	1.7843
492000 Couriers and messengers	1.4796	0.4326	17.6529	1.3330	1.2547
493000 Warehousing and storage	1.4445	0.4121	12.5336	1.3191	1.3616
511110 Newspaper publishers	1.3755	0.4191	10.8491	1.2760	1.3735
511120 Periodical publishers	1.3374	0.3090	6.9852	1.3529	1.5542
511130 Book publishers	1.0000	0.0000	0.0000	0.0000	0.0000
5111A0 Database, directory, and other publishers	1.2682	0.2527	5.3545	1.3343	1.6006
511200 Software publishers	1.4072	0.4255	7.1379	1.3196	2.0878
512100 Motion picture and video industries	1.3452	0.3322	12.1622	1.3206	1.2979
512200 Sound recording industries	1.0000	0.0000	0.0000	0.0000	0.0000
513100 Radio and television broadcasting	1.3457	0.3542	6.2575	1.2873	1.7141
513200 Cable networks and program distribution	1.3517	0.2704	5.9366	1.3971	1.6818
513300 Telecommunications	1.3481	0.2712	5.5151	1.4454	1.8373
514100 Information services	1.5097	0.5949	13.5989	1.2660	1.5012
514200 Data processing services	1.4582	0.4940	9.5423	1.3094	1.7781
52A000 Monetary authorities and depository credit intermediation	1.2759	0.2579	6.5450	1.3536	1.5545
522A00 Nondepository credit intermediation and related activities	1.3272	0.2743	6.2040	1.4318	1.8414
523000 Securities, commodity contracts, investments	1.4479	0.5189	11.6719	1.2729	1.4747
524100 Insurance carriers	1.4075	0.3128	6.8438	1.4831	1.7598
524200 Insurance agencies, brokerages, and related	1.3261	0.3595	8.6658	1.2879	1.4441
525000 Funds, trusts, and other financial vehicles	1.2554	0.1707	3.0226	1.7186	2.9160
531000 Real estate	1.3172	0.1647	5.8267	1.8817	1.8356
S00800 Owner-occupied dwellings	1.1103	0.0252	0.8028	0.0000	0.0000
532100 Automotive equipment rental and leasing	1.2948	0.1995	5.4610	1.5459	1.7857
532A00 General and consumer goods rental except video tapes and discs	1.3587	0.3347	8.5691	1.3561	1.5693
532230 Video tape and disc rental	1.3026	0.2414	11.8904	1.3528	1.2114
532400 Machinery and equipment rental and leasing	1.2631	0.2201	4.6653	1.4190	1.9678
533000 Lessors of nonfinancial intangible assets	1.0687	0.0981	1.4626	1.1994	1.6833
541100 Legal services	1.4467	0.5347	9.2456	1.2587	1.7053
541200 Accounting and bookkeeping services	1.4909	0.5998	20.0090	1.2486	1.2738
541300 Architectural and engineering services	1.4516	0.4497	10.4576	1.3588	1.6448
541400 Specialized design services	1.4739	0.5087	22.2620	1.3081	1.2326
541511 Custom computer programming services	1.5097	0.6200	11.7135	1.2600	1.6868

RIMS II Multipliers (1997/2004)
Table 1.4 Total Multipliers for Output, Earnings, and Employment by
Detailed Industry Matagorda and Brazoria Counties, TX (Continued)

INDUSTRY	Multiplier				
	Final Demand			Direct Effect	
	Output/1/ (dollars)	Earnings/2/ (dollars)	Employment/3/ (jobs)	Earnings/4/ (dollars)	Employment/5/ (jobs)
541512 Computer systems design services	1.5513	0.6337	12.2447	1.2880	1.7524
54151A Other computer related services, including facilities management	1.4080	0.3604	7.8507	1.4201	1.9580
541610 Management consulting services	1.5416	0.6426	16.1980	1.2647	1.4551
5416A0 Environmental and other technical consulting services	1.4799	0.5323	14.7438	1.2988	1.4277
541700 Scientific research and development services	1.4968	0.5012	10.3278	1.3175	1.6833
541800 Advertising and related services	1.3794	0.3633	8.3809	1.3325	1.6279
541920 Photographic services	1.3639	0.3189	7.9356	1.3873	1.6335
541940 Veterinary services	1.4662	0.3638	7.8412	1.4470	1.8910
5419A0 All other miscellaneous professional and technical services	1.2077	0.1620	3.0020	1.5140	2.8204
550000 Management of companies and enterprises	1.5041	0.6131	11.1611	1.2415	1.5477
561300 Employment services	1.3423	0.5109	25.9628	1.1909	1.1325
561500 Travel arrangement and reservation services	1.4843	0.4248	13.5257	1.4051	1.4200
561100 Office administrative services	1.4467	0.4809	10.7431	1.3186	1.6598
561200 Facilities support services	1.0000	0.0000	0.0000	0.0000	0.0000
561400 Business support services	1.3923	0.3736	13.0405	1.3561	1.3624
561600 Investigation and security services	1.4260	0.5325	24.6854	1.2413	1.1796
561700 Services to buildings and dwellings	1.5302	0.4229	24.0521	1.4484	1.2724
561900 Other support services	1.3484	0.3210	12.4951	1.3662	1.3203
562000 Waste management and remediation services	1.6078	0.3724	9.0906	1.5973	1.8424
611100 Elementary and secondary schools	1.6273	0.5442	26.5631	1.3638	1.2223
611A00 Colleges, universities, and junior colleges	1.5270	0.5221	19.0484	1.2936	1.2834
611B00 Other educational services	1.4143	0.3535	15.3775	1.4218	1.3194
621A00 Offices of physicians, dentists, and other health practitioners	1.4772	0.5489	11.2713	1.2734	1.5748
621600 Home health care services	1.4895	0.5553	26.0729	1.2756	1.2003
621B00 Other ambulatory health care services	1.5794	0.4838	12.4534	1.4232	1.6291
622000 Hospitals	1.5557	0.5386	13.7565	1.3263	1.5046
623000 Nursing and residential care facilities	1.5700	0.5895	25.6599	1.3088	1.2613
624400 Child day care services	1.4604	0.4416	39.8673	1.3206	1.1052
624A00 Social assistance, except child day care services	1.5368	0.5440	30.1882	1.3021	1.1693
711100 Performing arts companies	1.0000	0.0000	0.0000	0.0000	0.0000
711200 Spectator sports	1.2084	0.1860	6.0757	1.3715	1.3882
711A00 Promoters of performing arts and sports and agents for public figures	1.0000	0.0000	0.0000	0.0000	0.0000
711500 Independent artists, writers, and performers	1.2156	0.1430	4.1479	1.5921	1.7775
712000 Museums, historical sites, zoos, and parks	1.5670	0.5026	16.3073	1.3692	1.4192
713940 Fitness and recreational sports centers	1.5067	0.4640	26.1435	1.3286	1.1706
713950 Bowling centers	1.4696	0.4386	27.7877	1.3320	1.1516
713A00 Other amusement, gambling, and recreation industries	1.4400	0.4452	23.6073	1.2994	1.1719
7211A0 Hotels and motels, including casino hotels	1.4005	0.4177	17.0327	1.2885	1.2263
721A00 Other accommodations	1.4031	0.3027	14.5022	1.4531	1.2668
722000 Food services and drinking places	1.4380	0.4243	26.8261	1.3022	1.1434
8111A0 Automotive repair and maintenance, except car washes	1.4105	0.3583	14.2774	1.3677	1.3015
811192 Car washes	1.3849	0.3749	27.9967	1.3226	1.1260

RIMS II Multipliers (1997/2004)
Table 1.4 Total Multipliers for Output, Earnings, and Employment by
Detailed Industry Matagorda and Brazoria Counties, TX (Continued)

INDUSTRY	Multiplier				
	Final Demand			Direct Effect	
	Output/1/ (dollars)	Earnings/2/ (dollars)	Employment/3/ (jobs)	Earnings/4/ (dollars)	Employment/5/ (jobs)
811200 Electronic equipment repair and maintenance	1.4428	0.4798	14.1516	1.2774	1.3412
811300 Commercial machinery repair and maintenance	1.3872	0.4228	12.9929	1.2748	1.3192
811400 Household goods repair and maintenance	1.3347	0.3208	13.1192	1.3349	1.2730
812100 Personal care services	1.3998	0.3487	17.4190	1.3576	1.2281
812200 Death care services	1.3598	0.3056	10.8167	1.3938	1.3647
812300 Drycleaning and laundry services	1.4182	0.3585	17.6282	1.3626	1.2162
812900 Other personal services	1.3147	0.1695	7.1752	1.6950	1.4642
813100 Religious organizations	1.4960	0.5779	25.8549	1.2396	1.1767
813A00 Grantmaking and giving and social advocacy organizations	1.5065	0.4320	15.8347	1.4391	1.4121
813B00 Civic, social, professional and similar organizations	1.5231	0.4599	19.8519	1.3755	1.2685
491000 Postal service	1.4575	0.5605	11.4965	1.2345	1.4918
S00A00 Other government enterprises	1.6157	0.3436	8.9941	1.7226	1.8025
H00000 Households	0.6997	0.1638	6.0741	0.0000	0.0000

Region Definition: Brazoria, TX; Matagorda, TX

*Includes Government enterprises.

- Each entry in column 1 represents the total dollar change in output that occurs in all industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry.
- Each entry in column 2 represents the total dollar change in earnings of households employed by all industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry.
- Each entry in column 3 represents the total change in number of jobs that occurs in all industries for each additional 1 million dollars of output delivered to final demand by the industry corresponding to the entry. Because the employment multipliers are based on 2004 data, the output delivered to final demand should be in 2004 dollars.
- Each entry in column 4 represents the total dollar change in earnings of households employed by all industries for each additional dollar of earnings paid directly to households employed by the industry corresponding to the entry.
- Each entry in column 5 represents the total change in number of jobs in all industries for each additional job in the industry corresponding to the entry. NOTE.--Multipliers are based on the 1997 Benchmark Input-Output Table for the Nation and 2004 regional data. Appendix B identifies the industries corresponding to the entries. SOURCE.--Regional Input-Output Modeling System (RIMS II), Regional Economic Analysis Division, Bureau of Economic Analysis.

Question Number: 5.3.3.1-1**QUESTION:**

Justify the assumption in the 2nd paragraph of ER Section 5.3.3.1.2 that there will not be increased fogging.

Full Text (Supporting Information):

ER Section 5.3.3.1.2 states that the MCR did not increase fogging and that additional fogging is not likely to occur as a result of the addition of Units 3&4. The 1st paragraph of this section supports the first part of the statement; however, the technical basis has not been provided to support the second part. Operation of Units 3&4 may increase the heat load on the MCR without increasing the radiating surface area significantly. The facts need to be addressed technically before the second part of the statement can be accepted.

RESPONSE:

Although the heat load on the MCR will be increased, the increase in temperature in the MCR would be minimal. In addition to the heat load increase, the water level in the MCR will be increased. The additional water will dilute the overall temperature and serve to limit the overall increase in temperature of the MCR. In addition, the increased water level will result in a small increase in the surface area of the MCR. The increase in the MCR is expected to be only a few degrees. As described on Table 3.4-3 of the ER Section 3.4, the discharge and intake temperatures in the MCR were estimated for the addition of the heat load from STP 3&4. The table is reproduced below as Table 1, along with the calculated average for each month.

Table 1. Estimated MCR Temperature from the Operation of STP 1&2 and STP 3&4.

	CWS Intake Average Monthly Temperature (°F)				CWS Discharge Average Monthly Temperature (°F)			
	2003	2004	2005	Average	2003	2004	2005	Average
January	70	71.3	71.7	71.00	88.4	89.7	90	89.37
February	70.82	69.9	72	70.91	89.2	88.3	90.4	89.30
March	75.38	78.1	76.7	76.73	93.7	96.5	95.1	95.10
April	80.51	81.8	81	81.10	97.4	98.7	97.9	98.00
May	88.17	85.9	85.8	86.62	104.6	102.3	102.2	103.03
June	93.57	92.2	92.2	92.66	110	108.6	108.6	109.07
July	95.88	95	94.4	95.09	112.3	111.4	110.8	111.50
August	95.23	94	95	94.74	111.6	110.4	111.4	111.13
September	91.67	91.8	92.8	92.09	108.1	108.1	109.2	108.47
October	85.8	87.4	85.3	86.17	103.3	104.9	102.8	103.67
November	79.99	78.8	78.7	79.16	98.3	97.1	97	97.47
December	71.62	71.3	68.1	70.34	90	89.7	86.4	88.70

COLA ER Table 3.4-3

The average discharge and intake temperatures in the MCR were also estimated for the MCR from the heat load from STP 1&2 in the Construction Phase Environmental Report. The values from Tables 3.4-4, 3.4-5, 3.4-6, and 3.4-7 are summarized in Table 2. Figure 3.4-20 from the Construction Phase ER also provides the average water temperature by month for the Colorado River, the source of the makeup water for the MCR. These temperatures are provided in Table 3.

Table 2. Estimated MCR Temperature from the Operation of STP 1&2.

	Intake Average Monthly Temperature (°F)					Discharge Average Monthly Temperature (°F)				
	1952	1953	1957	1959	Average	1952	1953	1957	1959	Average
January	59.15	64.81	61.53	56.66	60.54	78.15	83.81	80.53	75.66	79.54
February	62.01	62.66	68.67	61.95	63.82	81.01	81.66	87.67	80.95	82.82
March	66.81	73.84	67.44	66.26	68.59	85.81	92.84	86.44	85.26	87.59
April	74.46	76.57	72.71	71.61	73.84	93.46	95.57	91.71	90.61	92.84
May	81.37	83.91	79.27	81.87	81.61	100.37	102.91	98.27	100.87	100.61
June	87.24	87.96	87.63	88.5	87.83	106.24	106.96	106.63	107.5	106.83
July	91.43	90.59	90.74	89.13	90.47	110.43	109.59	109.74	108.13	109.47
August	90.39	90.33	88.7	88.66	89.52	109.39	109.33	107.7	107.66	108.52
September	86.08	86.92	82.95	85.11	85.27	105.08	105.98	101.95	104.11	104.28
October	73.63	75.04	72.51	77.49	74.67	92.63	94.04	91.51	96.49	93.67
November	62.71	65.85	64.8	63.43	64.20	81.71	84.85	83.8	82.43	83.20
December	61.34	62.12	62.74	61.15	61.84	80.34	81.12	81.74	80.15	80.84

STP CP-ER Tables 3.4-4, 3.4-5, 3.4-6, and 3.4-7

Table 3. Average Monthly River Water Temperature

	Average Monthly River Water Temperature (°F)
January	56.56
February	58.44
March	63.63
April	72.81
May	77.38
June	82.88
July	85.38
August	83.81
September	81.38
October	73.00
November	64.56
December	58.25

A comparison of the increase in water temperature in the MCR resulting from the operation of STP 1&2 shows that the average increase in temperature of the water in the MCR was 22.7°F

over the temperature of the makeup water and the maximum increase was 24.7°F. Table 4 presents the change in temperature of the water in the MCR from the operation of STP 1&2. As described in the ER Section 5.3.3.1, the presence of the MCR did not significantly increase the fog occurrence over the naturally occurring fog. The average monthly increase in MCR temperature from the operation of STP 3&4 over the temperature from the operation of STP 1&2 is also presented in Table 4. The average increase in temperature of the MCR would only be 6.2°F and the maximum increase would only be 14.3°F.

Table 4. Temperature Increases.

	STP 1&2 to Makeup Water Increase in Temperature (°F)	STP 3&4 to STP 1&2 Increase in Temperature (°F)
January	22.98	9.83
February	24.39	6.48
March	23.96	7.51
April	20.03	5.16
May	23.23	2.43
June	23.96	2.23
July	24.10	2.03
August	24.71	2.61
September	22.91	4.19
October	20.67	10.00
November	18.64	14.27
December	22.59	7.86
Average	22.68	6.22
Maximum	24.71	14.27

This small increase in temperature of the MCR will not significantly change the existing difference in temperature between the MCR and the atmosphere. With the absence of a moderate to large increase in temperature difference between the MCR and the atmosphere, an increase in the frequency of fogging would not be expected to be noticeable.

CANDIDATE COLA REVISION:

No COLA revision is required as a result of this response.