

**Requests for Additional Information (RAIs)
South Texas Project Units 3 and 4
Combined Operating License Application
RAI Submittal 4**

RAI Number	Regulatory Basis	RAI Summary	Full Text (Supporting Information)
1.2-1	10 CFR 51.71(d)	Provide a description of the route along the Colorado River to the STP site for barging materials to be utilized for Units 3 and 4.	For cumulative impact and ESA consultation purposes, provide the route for barging material to STP. Will the access to the Colorado River be through the GIWW or the diversion canal in Matagorda Bay? Will travel be from the south (e.g., through the Matagorda Shipping Channel), or from the north (e.g., from Port of Freeport down the GIWW)?
2.7 – 6	10 CFR 51.50 10 CFR 51.70(b) 10 CFR 51 Appendix A	Provide updated atmospheric dispersion factors for ER Section 2.7.5.2, updated Exclusion Area Boundary (EAB) distances for Table 7.1-7, and updated dose calculations for Tables 7.1-8 through 7.1-15.	Safety RAI 02.03.05-8 pointed out apparent discrepancies in distances used for calculation of long-term dispersion analyses for assessing the potential consequences of routine releases for the proposed STP Units 3 and 4. Safety RAIs 02.03.04-3 and 02.03.04-5 dealt with the determination of distances from potential release points for the proposed STP Units 3 & 4 and the exclusion area boundary. STPNOC's responses to these RAIs included changes to the distances used in dose calculation and resultant changes to the atmospheric dispersion and deposition parameter values used in dose calculations in the FSAR and ER. The changes in distances used for the calculations have not been incorporated into the ER. Please incorporate these changes as appropriate.

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3.3 - 1	10 CFR 51.71(d)	Provide clarification of changes made to Table 3.3-1 in Revision 2 of the ER.	<p>In ER Revision 2, Table 3.3-1, normal and maximum water use values for several of the water streams increased from the previous revision. Provide a description of the changes in plant systems that brought about these increases.</p> <p>In ER Revision 2, natural evaporation values for the MCR were removed from Table 3.3-1. ER Revision 2, Section 3.3.1 states "STP 1 & 2 water usage can be seen in Reference 3.3-2." Reference 3.3-2 is listed as Amendment 10 to the South Texas Project Units 1 and 2 Environmental Report, dated July 16, 1987. However, staff was not able to find any water usage values for STP Units 1 and 2 in this reference. Please provide an updated reference for STP Units 1 and 2 water usage including natural evaporation from the MCR.</p> <p>State clearly which values included in Table 3.3-1 are based on observations, which are design values, and which are estimated from simulations.</p>

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4.2 - 14	10 CFR 51.71(d)	Clarify the water body(ies) into which dewatering and storm waters would be discharged from construction excavation activities. Specify the anticipated flow rates into Little Robbins Slough if discharge waters would flow into this water body.	<p>In response to RAI 4.2-6 (letter dated July 2, 2008) regarding water disposal during dewatering activities, STPNOC stated in part “The options could include the following or a combination of the following: 1) water could be decanted to the MCR after pumping to a retention pond. This would not result in impacts to site surface water drainage features. 2) Pump to retention pond(s) then discharge under TPDES Permit to site surface water body (ies). This could impact existing ecologic communities as a result of raising the water levels of the receiving water bodies ...” In response to RAI 4.2.2 (letter dated July 15, 2008), STPNOC stated “Water pumped from construction excavations during dewatering activities would be pumped to the MCR for use. The water could also be discharged to a retention pond where the silt would settle prior to allowing the water to discharge out of a retention pond(s) to site drainage swales and the site ditch system. If water from dewatering activities were discharged in this manner, the flow in Little Robbins Slough could increase substantially during this phase of construction ...” However, in FSAR Rev 2 Section 2.5S.4.5.4.1 "Dewatering Method", STPNOC states "The effluent from the dewatering well system will be controlled, and discharged into drop structures. The discharge points are located in the existing MCR." There is no mention of possible discharge to Little Robbins Slough. Regarding the storm water system for the excavated area, FSAR Rev 2 Section 2.5S.4.6.2.2 states “(t)he storm water will then be pumped into the MCR.” Again, there is no mention of an alternative involving Little Robbins Slough. In order for the staff to evaluate impacts to aquatic communities on site and within the vicinity of the site, the location for discharge of water from dewatering activities needs to be clarified.</p>

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5.2-6	10 CFR 51.71(d)	Clarify the operating policy of the MCR discharge to the Colorado River with respect to the existing TPDES permit.	<p>In response to staff's RAI 5.2-5 (STPNOC Letter U7-C-STP-NRC-090091 dated July 30, 2009), STPNOC stated, for operation of Units 1 and 2, that "Blowdown is permitted only when the river flow at the blowdown facility is greater than or equal to 2500 cfs." (page 5 of 11). The existing TPDES permit allows discharges from the MCR to the Colorado River if the river flow at the discharge location is greater than or equal to 800 cfs. Clarify whether the 2500 cfs river flow at the discharge location is an existing STPNOC operating policy and not a permit condition.</p> <p>In response to staff's RAI 2.3-6 (STPNOC Letter U7-C-STP-NRC-090006 dated January 22, 2009), STPNOC stated, for operation of all four units, that "Blowdown is permitted only when the river flow at the blowdown facility is greater than or equal to 2500 cfs." (page 3 of 17). The existing TPDES permit allows discharges from the MCR to the Colorado River if the river flow at the discharge location is greater than or equal to 800 cfs. Clarify if the 2500 cfs river flow at the discharge location would be the STPNOC operating policy when all four units are in operation. Would there be future discharges from the MCR when the river flow at the discharge location is less than 2500 cfs but greater than or equal to 800 cfs?</p>

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RAI Number	Regulatory Basis	RAI Summary	Full Text (Supporting Information)
5.2-7	10 CFR 51.71(d)	Explain the apparent discrepancy in forced evaporation values for STP Units 1 and 2 reported in response to staff's RAI 2.3-6.	<p>ER Revision 2, Table 2.9S-1, Plant Parameters and Site Characteristics for STP Units 1 and 2, mentions a river water consumptive use of 37,100 ac-ft/yr. In response to staff's RAI 2.3-6 (STPNOC Letter U7-C-STP-NRC-090006 dated January 22, 2009), STPNOC stated, in the proposed text changes to ER Subsection 10.5S.2.2, that the normal forced evaporation of STP Units 1 and 2 is 33,200 ac-ft/yr.</p> <p>Clarify the difference in these values and provide the source for each. State the forced evaporation values for STP Units 1 and 2 and provide a reference or a source for these values.</p>
5.2-8	10 CFR 51.71(d)	Explain the apparent discrepancy in proposed text changes to ER Subsection 3.3.1, ER Subsection 10.5S.2.2, and the proposed changes to ER Table 3.3-1.	<p>In response to staff's RAI 2.3-6 (STPNOC Letter U7-C-STP-NRC-090006 dated January 22, 2009), STPNOC stated, in the proposed text changes to ER Subsection 3.3.1, that the forced evaporation of STP Units 3 and 4 is 23,190 gpm (37,405 ac-ft/yr) at 100% load and 21,600 gpm (34,841 ac-ft/yr) at 93% load (page 16 of 17). In the same letter, STPNOC stated, in proposed changes to ER Table 3.3-1, that the normal MCR forced evaporation from STP Units 3 and 4 is 23,190 gpm (37,405 ac-ft/yr) and the maximum is 49,000 gpm (79,037 ac-ft/yr) (page 16 of 17). In the same letter, STPNOC stated, in the proposed text changes to ER Subsection 10.5S.2.2, that the normal and maximum forced evaporation from STP Units 3 and 4 are 34,850 ac-ft/yr and 38,050 ac-ft/yr (page 17 of 17).</p> <p>Clarify the difference in these values and provide the source for each. Please state the forced evaporation values for STP Units 3 and 4 and provide a reference or a source for these values.</p>

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5.2-9 (follow-on to RAI 5.2-4)	10 CFR 51.71(d)	Provide details of the calibration of the MCR thermal model.	<p>The applicant provided a brief description of the calibration of the MCR thermal model in response to staff's RAI 5.2-4. Provide the following additional information:</p> <ol style="list-style-type: none"> 1. A schematic representation of the MCR used within the model, 2. A list of model parameters that were included in the calibration, 3. The objective function used in the calibration, 4. Goodness-of-fit measures used, and 5. A description of the data and methods used to validate the model predictions of natural and forced evaporation from the MCR. <p>Also include a description of any analysis performed to determine the sensitivity of the model to parameter values.</p>
5.3.1 – 1	10 CFR 51.71(d)	Provide a description or document that outlines the procedures followed by electrical transmission line operators to minimize bird strikes and electrocution risk. If an <i>Avian Protection Plan</i> or avian protection policies are used by transmission line operators to implement protective measures, provide copies of these documents.	STP lies within the Central migratory flyway for birds and is within 10 miles of several migratory songbird stopover areas. The Texas Parks and Wildlife Department has provided a scoping letter to the NRC (May 18, 2008) that requests an analysis of the potential increase in bird strikes from proposed new/upgraded aerial electrical transmission lines and information regarding proposed measures to reduce avian mortality (i.e., line markers).

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RAI Number	Regulatory Basis	RAI Summary	Full Text (Supporting Information)
5.3.2.1 - 1	10 CFR 51.71(d)	Provide clarification of data used in STPNOC's CORMIX simulation.	In response to staff's RAI 5.3.2-1, STPNOC provided input files and previously collected data that supported a CORMIX simulation of the MCR blowdown discharge to the Colorado River. In order for the staff to evaluate if these data are suitable for input into CORMIX, provide (a) the date(s) when the cross section of the Colorado River was measured, (b) the reference datum used for these depth measurements and the reference datum for the cross section depth values reported in the files provided by STPNOC to the staff, (c) any discharge measurements made concurrently on the same date(s), (d) location in the Colorado River with respect to the blowdown discharge diffuser where the cross section was measured, (e) description of how the "cold-end pond temperature" was estimated, and (f) the location within the MCR that corresponds to the "cold end."

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5.3.3.1 - 3	10 CFR 51.50 10 CFR 51.70(b) 10 CFR 51 Appendix A RG 4.2	Provide an analysis of UHS cooling tower impacts for normal operation.	<p>The text on ER Rev 2 page 5.3-21 (Section 5.3.3.1) states that the input to the SACTI code analysis of cooling tower impacts is for the 'normal' operational mode. However, review of the information in the input files and comparison of that information with information on UHS cooling tower operation in ER Section 3.3 (Table 3.3-1), ER Section 3.4 (Table 3.4-1), and FSAR Sections 9.2.5.3 through 9.2.5.6 clearly shows that the SACTI analysis is for maximum heat rejection. The FSAR indicates that maximum heat rejection would only last for about 3 days following reactor shutdown. It is also likely that simultaneous shutdown of both Units 3 and 4 would be infrequent. Therefore, the potential impacts (visible plume characteristics and salt deposition) of UHS cooling tower operation are significantly over-estimated. The ER needs to present realistic estimates of environmental impacts. Note also that the drift eliminator description in the July 2008 SACTI input file is not the same as found in FSAR Section 9.2.5.5.2 (3) Drift Losses (Page 9.2-11). The FSAR indicates a "...2-inches center-to center Belgian wave form" drift eliminator. The SACTI input file indicates a "Standard Herringbone" drift eliminator. Update the FSAR, ER, and input to SACTI to be consistent and provide a revised a SACTI analysis for normal plant operation based on the consistent cooling tower information.</p>

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RAI Number	Regulatory Basis	RAI Summary	Full Text (Supporting Information)
5.9.5 – 1	10 CFR 51.45	Provide an evaluation of doses to biota living in and around the MCR from both the liquid and gaseous effluents (use of appropriate surrogate species is acceptable). Include dose calculations for Units 1 & 2 and for proposed Units 3 & 4 (LADTAP II and GASPAR II input and output files).	ER Section 5.4.4 and Table 5.4-10 provide an evaluation of doses to biota for STP Units 3 & 4. The table addresses doses from liquid pathways at Little Robbins Slough, but does not address liquid pathways at the MCR.

RAI Number	Regulatory Basis	RAI Summary	Full Text (Supporting Information)
5.10 - 4	10 CFR 51.71(d)	<p>Provide clarification regarding STPNOC's intent to use only the existing groundwater permit limit of 3000 ac-ft/yr, or to apply for an increase to 3500 ac-ft/yr. If the intent is to apply for an increase in the groundwater permit limit, then provide an analysis of impact.</p>	<p>Conflicting statements exist in the ER and FSAR regarding the groundwater permit limit and water supplied beyond the limit. In ER Rev 2 Section 5.2.2.2, STP states "During normal operations of STP 3 & 4, STPNOC would use groundwater in excess of that used by STP 1 & 2 up to the current permitted limit of 3000 ac-ft/yr..." and "To meet the proposed maximum or peak groundwater demand ...for STP 3 & 4, STPNOC would supply water needed for STP 3 & 4 UHS makeup in excess of the normal operations groundwater value... by using water stored in the MCR..." In ER Rev 2 Table 5.10-1 STP states, "STPNOC will apply to Coastal Plains Groundwater Conservation District for an increase in the site's current groundwater permit from 3000 acre-feet per year to 3500 acre-feet per year up to the current permitted limit with the remainder of the water requirements met by water from the Main Cooling Reservoir (MCR)." [bold by NRC staff]. NRC staff understands that permits are required by the Coastal Plains Groundwater Conservation District (CPGCD) to drill new wells under an existing permit limit, or to amend a permit and increase the permit limit. From STPNOC's statements cited above and others in the ER and FSAR, and from NRC staff's understanding of the CPGCD's rules, it is not clear which permits and permit amendments STPNOC will be seeking.</p> <p>Will groundwater use be limited to the existing groundwater permit limit of 3000 ac-ft/yr, within the flexibility of the existing permit (e.g., multiple wells, averaging over 3-yr period), during both construction and operation of the proposed units? Is there intent to seek an increase in the permit limit when applying for the permits to construct two new wells or at any time prior to operating the proposed units? If STPNOC's intent is to apply for an increased permit limit, NRC would expect to receive an analysis of incremental increase and overall usage including a discussion of (1) groundwater resource availability, (2) drawdown at property line and at off-site well(s) from long-term normal use and short-term peak usage, (3) recovery time from peak usage, (4) salt water intrusion, and (5) subsidence.</p>

**U.S. Army Corps of Engineers' RAIs
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RAI Number	RAI Summary	Full Text
Corps - 1	Provide a detailed description and appropriate plan drawings of the proposed impacts to waters of the United States so that the Corps may conduct a proper evaluation of the project.	<p>The Corps is uncertain as to the proposed impacts to waters of the United States. A permit determination was completed in June 2009 that concluded the proposed activity would require a Corps permit pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899. It is the Corps' understanding that subsequent to this determination, STPNOC's proposed impacts to waters of the United States have been modified. Therefore, provide:</p> <p>(1) a plan and elevation drawing showing the general and specific site location and character of all proposed activities, including the size relationship of the proposed structures to the size of the impacted waterway and depth of water in the area drawings of the proposed construction and their impacts to waters of the United States;</p> <p>(2) a description of the type, composition and quantity of the material to be dredged, the method of dredging, and the site and plans for disposal of the dredged material;</p> <p>(3) the source of the fill material; the purpose of the discharge, a description of the type, composition and quantity of the material; the method of transportation and disposal of the material; and</p> <p>(4) a statement describing how impacts to waters of the United States are to be avoided and minimized and either a statement describing how impacts to waters of the United States are to be compensated for or a statement explaining why compensatory mitigation should not be required for the proposed impacts to waters of the United States.</p>

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Corps – 2	Provide detailed information on the location, size, type, functions and amount of impact to aquatic and other resources such as aquatic insects and amphibians.	<p>The discharge of dredged or fill material can result in the loss or change of the physical, chemical and biological processes that occur in aquatic resources. This includes the loss and fragmentation of breeding and nesting areas, escape cover, travel corridors, and preferred food sources for resident and transient wildlife species, such as resident and transient mammals, birds, reptiles, and amphibians, associated with the aquatic ecosystem.</p> <p>The Corps' regulations require appropriate and practicable compensatory mitigation to replace functional losses to aquatic resources. Where appropriate, the use of a functional assessment to determine loss of aquatic function and compensatory mitigation requirements is preferred.</p> <p>This information will assist the Corps in its permit evaluation and environmental documentation of the proposed actions and its alternatives. It will also help ensure that the ecological functions included in the 404 (b)(1) Guidelines are fully considered.</p>
Corps – 3	Provide a “no-action” alternative that would result in no construction requiring a Corps permit.	<p>In order to embrace all of STPNOC's alternatives, the Corps requires STPNOC to include a “no action” alternative that results in no construction requiring a Corps permit. A no action alternative may result if (1) STPNOC elects to modify the proposed action to eliminate work under the jurisdiction of the Corps or (2) the Corps permit is denied.</p>