May 12, 2008

Mr. Gregory Gibson, Manager
Regulatory Affairs
STP Nuclear Operating Company
P. O. Box 289
Wadsworth, TX 77483

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 39 RELATED TO THE SRP SECTION 02.04.12 FOR THE SOUTH TEXAS COMBINED LICENSE APPLICATION

Dear Mr. Gibson:

By letter dated September 20, 2007, STP Nuclear Operating Company (STPNOC) submitted for approval a combined license application pursuant to 10 CFR Part 52. The U. S. Nuclear Regulatory Commission (NRC) staff is performing a detailed review of this application to enable the staff to reach a conclusion on the safety of the proposed application.

The NRC staff has identified that additional information is needed to continue portions of the review. The staff's request for additional information (RAI) is contained in the enclosure to this letter.

To support the review schedule, you are requested to respond within 45 days of the date of this letter. If changes are needed to the safety analysis report, the staff requests that the RAI response include the proposed wording changes.

If you have any questions or comments concerning this matter, you may contact me at 301-415-1146 or Raj.Anand@nrc.gov, or you may contact George Wunder at 301-415-1494 or George.Wunder@nrc.gov.

Sincerely,

/RA/

Raj Anand, Project Manager
ESBWR/ABWR Projects Branch 2
Division of New Reactor Licensing
Office of New Reactors

Docket Nos.: 52-012
52-013

eRAI Tracking No. 253

Enclosure:
Request for Additional Information

cc: William Mookhoek

If you have any questions or comments concerning this matter, you may contact me at 301-415-1146 or Raj.Anand@nrc.gov, or you may contact George Wunder at 301-415-1494 or George.Wunder@nrc.gov.

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Enclosure:
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cc: William Mookhoek

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OFFICE	SBPB/TR	SBPB/BC	NGE2/PM	OGC	NGE2/L-PM
NAME	HAhn*	MThaggard*	RAnand*	JBiggins*	GWunder*
DATE	5/06/08	5/08/08	5/08/08	5/09/08	5/12/08

***Approval captured electronically in the electronic RAI system.**

OFFICIAL RECORD COPY

Request for Additional Information

South Texas Project Units 3 and 4
South Texas Project Nuclear Operating Co
Docket No. 52-012 and 52-013
SRP Section: 02.04.12 - Groundwater
Application Section: 02.04S.12 - Groundwater

QUESTIONS

02.04.12-1

Provide a summary of the process followed to develop the site hydrogeologic conceptual model so staff can better understand the plausible alternative conceptual models that have been considered and rejected. The site hydrogeologic conceptual model provides the background for all to understand (a) the maximum groundwater elevation possible at the site, (b) potential alteration of groundwater gradients, (c) the relationship between the MCR and surrounding relief, observation and production wells, and (d) plausible alternative pathways and points of exposure. This RAI is presented first because the response to it will permeate the whole of Sections 2.4S.12 and 2.4S.13. It is not expected that the applicant's response be contained entirely in the first section of future revisions of 2.4S.12.

02.04.12-2

The depths to and thicknesses of hydrogeologic units described in 2.4S.12.1.3 are not the same as those shown in Figure 2.4S.12-29 and Table 2.4S.12-14. There is a similar inconsistency on Page 2.4S.12-10, Section 2.4S.12.2.2. for the 0.06 to 0.29 downward hydraulic gradient. Please clarify or resolve these inconsistencies.

02.04.12-3

In FSAR Section 2.4S.12.2.1 the applicant states that in 1985 the Texas Water Development Board (TWDB) made projections that groundwater resource use would drop 48% in Matagorda County by 2030. We are about midway through the projection period. Are there data to suggest this is a valid forecast today? Data in Table 2.4S.12-5 suggest groundwater usage is as high now as before. Please clarify and explain the current relevance of the projections.

02.04.12-4

In FSAR Section 2.4S.12.2.1, "Historical and Projected Groundwater Use", projections through the year 2030 do not cover the expected life of the proposed facility. Provide groundwater use projections through the expected life of the plant. Provide the data in FSAR Table 2.4S.12-6 divided between surface water and groundwater projected water needs.

02.04.12-5

Provide detailed surface maps for top and bottom elevations of both Upper and Lower Shallow Aquifers as they are needed to better understand and predict on-site groundwater flow and pathways. Figure 2.4S.12-10 shows many piezometric wells around Units 1 and 2, but it is not clear

whether the water level data from all the wells were used for the water level contour maps in Figure 2.4S.12-19. Please clarify.

02.04.12-6

In FSAR Section 2.4S.12.2.2., Page 2.4S.12-10, the topic of relief wells and toe drain acting to reduce reservoir influence on the shallow aquifer is not sufficiently described. It is not clear that communication between the MCR and aquifer is potentially through the dike but primarily elsewhere, (e.g., perhaps through pits excavated in the bottom of the MCR). Also, the statement that there is an "absence of significant water ponding on the downgradient side of the MCR dike" fails to acknowledge the presence and role of the engineered drainage ditch that surrounds the MCR. Please clarify.

02.04.12-7

In FSAR Section 2.4S.12.2.3, "Temporal Groundwater Trends", is the recovery seen in data from Well 8015402 typical of the groundwater resource in the region or is it a local phenomenon? Does this reflect a regional trend toward lower groundwater resource usage? Does this align with the forecast by the TWDB in 1985 that groundwater resource use in Matagorda County would drop by 48% by 2030? How does this align with the annual data on groundwater use in the county reported in Table 2.4S.12-5? They appear contradictory. Please clarify.

02.04.12-8

An inconsistency exists in FSAR Section 2.4S.12.2.3, Page 2.4S.12-10, and Figure 2.4S.12-23 – Upper Shallow Aquifer panel. Review the seasonal variability observed in 601 and 603B. Please clarify.

02.04.12-9

In FSAR Section 2.4S.12.2.3, "Temporal Groundwater Trends", the applicant acknowledges the groundwater field observations do not span a full year and therefore, do not provide the seasonal data required in the application. Provide the seasonal data set.

02.04.12-10

See FSAR Section 2.4S.12.2.3, "Temporal Groundwater Trends". Safety related structures for the ABWR will be constructed on engineered backfill. The excavation will remove the overlying clay and silt deposit that confines or semi-confines the Upper Shallow Aquifer. Assuming the backfill could be more permeable than the original clay and silt deposit, the hydraulic head in the vicinity of safety related structures can be expected to be as high as 27 ft MSL simply based on the observed present-day maximum. This is 3 ft below the pre-construction grade of 30 ft MSL, and would be 5 ft below the planed finished plant grade for STP Unit 3 of 32 ft MSL. However, this more permeable material will also be more likely to allow infiltration from storm events. Will backfill material near and at the ground surface be designed to be less permeable? Thus, following storm runoff and infiltration events, would one expect a somewhat higher water table elevation local to safety related structures? Would water table elevations local to the facilities be monitored? Would the applicant be prepared to detect and ensure the ABWR DCD requirement of a maximum groundwater level of 2 ft below ground surface is not violated? Or, are engineered systems going to be in place to limit infiltration into the disturbed environment?

02.04.12-11

In FSAR Section 2.4S.12.2.4, Page 2.4S.12-11, is the information in the second paragraph summarized in Table 2.4S.12-14? It does not appear to be present in the table, but should be. Please indicate whether or not these properties represent the vadose zone and the confining sequence above the Upper Shallow, or some portion of the Shallow Aquifer.

02.04.12-12

Describe the relationship (e.g., hydrologic profile of the screened intervals) of the test well and the production wells where the former is completed to 819 ft and the latter are completed to 600-700 ft below the ground surface.

02.04.12-13

Please provide the hydrogeologic profiles of all types of wells in the application. Provide typical drawings where appropriate (e.g., relief wells and observation wells). Provide profiles for each production well.

02.04.12-14

In FSAR Section 2.4S.12.2.4.1, Page 2.4S.12-13, (refer to Figure 2.4S.12-19) a statement is made that "flow pathway …(is)… from the MCR toward STP 3 and 4." The head drop in the figure implies flow in the opposite direction, i.e., toward the MCR from STP 3 and 4. Please clarify.

02.04.12-15

In FSAR Section 2.4S.12.2.4.1, "Hydrogeological Parameters", the presence of a paleochannel is suggested by the applicant. How far could the suggested paleochannel extend to the northwest and south? Could this longer but higher conductivity pathway release to the Colorado River sooner than the projected pathway through less conductive material? What process was used to eliminate this alternate conceptual model and pathway from consideration for the analysis in FSAR Section 2.4S.13?

02.04.12-16

In FSAR Section 2.4S.12.2.5, Page 2.4S.12-15, make clear why connectivity between OW-332U and L, and OW-930U and L would not be significant to pathways used in analysis. This connectivity virtually parallels the shortest path projected in both the Upper Shallow Aquifer and the Lower Shallow Aquifer. Explain why a shortened pathway may be created by combining water movement in the Upper Shallow Aquifer with that in the Lower Shallow Aquifer or vice-versa not occur.

02.04.12-17

In FSAR Section 2.4S.12.3.1, "Exposure Point and Pathway Evaluation", the applicant provides the first discussion and lays the foundation for alternate pathways considered in FSAR Section 2.4S.13. In FSAR Section 2.4S.13.1.2, "Conceptual Model", the applicant states "the downward hydraulic gradient between the Upper and Lower Shallow Aquifer indicates that there is no mechanism to lift the liquid effluent up into the Upper Shallow Aquifer." In this foundational section on pathways, please describe the process followed to consider and eliminate alternate conceptual models and determine the plausible alternative pathways. When doing so, describe and consider the effect the

released liquid could have on the natural system, including thermal buoyancy effects and chelating agents. This is related to RAI 02.04.12-1.

02.04.12-18

In FSAR Section 2.4S.12.3.1, “Exposure Point and Pathway Evaluation”, the applicant has placed an emphasis on present day well location. During the period of licensing being considered, nothing prevents a domestic groundwater well completed in the Shallow Aquifer, albeit of poor water quality, from being located at the site boundary. Provide a rationale for moving beyond the site boundary for off-site exposure.

02.04.12-19

In FSAR Section 2.4S.12.3.1, “Exposure Point and Pathway Evaluation”, the applicant has placed an emphasis on the present day well being a “livestock” well. However, the Shallow Aquifer is an acknowledged source of “livestock and domestic” water. Provide a rationale for limiting discussion of Shallow Aquifer groundwater to “livestock” purposes.

02.04.12-20

With regard to FSAR Figures 2.4S.12-17 and 2.4S.12-19: (a) while the groundwater head maps presented in these figures were used to determine contamination pathways, the staff recognize the following weaknesses in the presented information: (i) the groundwater head contours were drawn based on very limited observation data points, especially on the northeast side of MCR; (ii) while the applicant states that MCR water recharges into the Shallow Aquifer, the pattern of groundwater head distribution in and surrounding the MCR is not clearly defined (modified to address effects of MCR on exposure routes); and (iii) the projected pathways near the existing and new units are not clearly defined. Clarify the above issues and provide improved potentiometric surface maps. (b) discuss how the patterns of groundwater flow and pathways could change after the construction of the proposed units, and describe implications for the plausible pathways. (c) describe potential changes to the potentiometric surfaces of the Upper and Lower Shallow Aquifer and describe implications for the plausible pathways in cases of (i) continued greater usage of this resource (ii) prolonged periods of wet climate, and (iii) prolonged periods of dry climate. (d) Based on the above discussions and descriptions, provide refined post-construction pathway and travel time estimates in the Section 2.4S.12.3.1, “Exposure Point and Pathway Evaluation.”

02.04.12-21

In FSAR Section 2.4S.12.3.1, Page 2.4S.12-16, with regard to the Upper Shallow Aquifer and the unnamed tributary into which it discharges, where does this stream enter the public domain? Why is effluent release into the Lower Shallow Aquifer described as “conservative”?

02.04.12-22

In FSAR Section 2.4S.12.3.1, Page 2.4S.12-17, provide the basis for the statement that there is “no credible offsite release pathway for Deep Aquifer.” To what extent does the conclusion reached rely on the continued operation of deep production wells? What about timing? What if a release occurred near the end of plant design life? Are there more germane reasons that this is not a plausible pathway?

02.04.12-23

In FSAR Section 2.4S.12.3.3, Plant Groundwater Use and Effects, the statement “Based on these estimates, additional groundwater wells will be required to satisfy site demands.” appears to conflict with statements in the ER where adherence with the existing groundwater use permit and use of existing wells is stressed (e.g., see ER Sections 2.3.2.2.1, 4.2.2, and 5.2.2.2). Will there be new additional wells or not? The statement “As part of the detailed engineering for the STP 3 and 4, the impact of groundwater pumping in the Deep Aquifer will be evaluated …” makes it appear the future use of a greater groundwater resource is undecided and will remain undecided during the COL review process. The last sentence of FSAR Section 2.4S.12.5 begins “The groundwater supply wells to be installed for STP 3 and 4 …” and implies a decision has been made. Please clarify. Also, if new wells are to be installed, provide the estimated number, location, and pumping rates so that effects can be estimated.

02.04.12-24

In FSAR Section 2.4S.12.4, “Monitoring or Safeguard Requirements”, provide a description of the actual monitoring or safeguard requirements for the proposed STP Units 3 and 4. Describe current STP groundwater monitoring program, if the program for STP Units 3 and 4 will be patterned after them. Why isn’t one of the declared purposes of groundwater level measurements in the vicinity of safety related structures to ensure that groundwater is more than 2 ft below the plant grade at all times?

02.04.12-25

In Section 2.4S.12.4, Page 2.4S.12-20, the applicant states that an unlikely event would “trigger” operational accident monitoring. Explain what would detection of groundwater contamination by operational accident monitoring “trigger”?

02.04.12-26

In FSAR Section 2.4S.12.5, “Site Characteristics for Subsurface Hydrostatic Loading”, Figure 2.4S.12-32 presents a graph of maximum allowed hydrostatic pressure, and the hydrostatic pressure associated with the maximum observed hydraulic head. What guarantees that the past maximum observed groundwater level will not be exceeded after construction of the new units? Given the substantial changes to be made to topography and land surface (type, vegetation, etc.), how good a predictor of future water level is the past measured hydraulic head? Will the water table elevation be monitored and a program be in place to ensure that the water table is always below the 2 ft below grade requirement?