Exelon Generation®

NP-12-0022
June 18, 2012

10 CFR 52, Subpart A

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Subject: Exelon Nuclear Texas Holdings, LLC
Victoria County Station
Early Site Permit Application
Environmental Report – Response to ER RAI Letters No.6 and No.9
Docket No. 52-042

References: (1) USNRC letter to Ms. Marilyn C. Kray, Environmental Request for Additional Information Letter No.6 Related to ESRP Sections 9.3 Alternative Sites for Victoria County Station Early Site Permit Application, dated April 19, 2012

(2) USNRC letter to Ms. Marilyn C. Kray, Environmental Request for Additional Information Letter No.9 Related to Cultural Resources and Transportation for Victoria County Station Early Site Permit Application, dated May 4, 2012

Exelon is responding to the following questions contained in NRC Request for Additional Information (RAI) letter No.6 (Reference 1):

- ESP EIS 9.3.1-2 (eRAI No.6395)

Exelon's response to the above-referenced RAI constitutes a complete response to NRC RAI Letter No.6. The response to RAI 6395 is provided in Attachment 1.

Exelon is also responding to the following questions contained in NRC RAI letter No.9 (Reference 2):

- CR-1 (eRAI No.6429)
- CR-2 (eRAI No.6429)
- CR-3 (eRAI No.6429)
- CR-4 (eRAI No.6429)
- TR-3.8-1 (eRAI No.6430)
- TR-3.8-2 (eRAI No.6430)
- TR-3.8-3 (eRAI No.6430)

Exelon's responses to the above-referenced RAIs constitute a complete response to NRC RAI Letter No.9. The RAI letter No.9 responses comprise Attachments 2-8.

No regulatory commitments are made in this response letter.

D087
NRO

If additional information is required, please contact Joshua Trembley at (610) 765-5345.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 18th day of June, 2012.

Respectfully,

Marilyn C. Kray
Vice President, Nuclear Project Development

Attachments:

(1) Response to ESP EIS 9.3.1-2 (eRAI No.6395)
(2) Response to CR-1 (eRAI No.6429)
(3) Response to CR-2 (eRAI No.6429)
(4) Response to CR-3 (eRAI No.6429)
(5) Response to CR-4 (eRAI No.6429)
(6) Response to TR-3.8-1 (eRAI No.6430)
(7) Response to TR-3.8-2 (eRAI No.6430)
(8) Response to TR-3.8-3 (eRAI No.6430)

cc: USNRC, Director, Office of New Reactors/NRLPO
USNRC, Project Manager, VCS, Division of New Reactor Licensing
USNRC, Environmental Project Manager, VCS, Division of New Reactor Licensing
USNRC Region IV, Regional Administrator
Argonne National Laboratory, Project Manager, VCS
EDMS

ESP EIS 9.3.1-2 (eRAI No.6395):

NRC Request:

Per the ESRP Section 9.3, the NRC must evaluate each of the alternative sites proposed by the applicant. All information available that would contribute to that evaluation should be considered. Engineering evaluations that were discussed at the alternative site audit by the applicant with respect to the potential flooding at the Matagorda site speak directly to that site's overall suitability. The environmental impacts that would be associated with necessary amendments to the site to address flooding potential must be incorporated into NRC's evaluation of the site's overall suitability. To ensure equitable evaluations of all alternative sites and their comparison to the proposed site in support of NRC's determination of the existence of an environmentally superior site, flooding potential considerations are being requested for each of the alternative sites as well as the proposed site.

(a) Provide a discussion regarding the detailed engineering evaluation of the Matagorda site that resulted in an identification of flooding potential from storm surge or other external events, the determination that fill would be needed to elevate the ground surface in the power block to prevent storm surge impacts, and the revised score for the site that resulted from the introduction of this new information.

(b) Provide evaluations of the flooding potential of the VCS site and the other alternative sites, as applicable. Provide qualitative analyses of the environmental impacts that would result from the actions necessary to amend the VCS site and each alternative site to overcome flooding and other issues/concerns at each location. Include both the direct and indirect impacts to the various resources from the necessary amendments to each site.

RAI Part (a) Response:

Matagorda County Site Flooding Evaluation

The first part of (a) requests a discussion regarding the detailed engineering evaluation of the Matagorda site that resulted in an identification of flooding potential from storm surge or other external events and the determination that fill would be needed to elevate the ground surface in the power block to prevent storm surge impacts.

The flooding potential from storm surge and other external events at the Matagorda County site was evaluated at a conceptual level. Preliminary evaluations indicated that the site would be inundated during a design basis flood event, requiring the plant grade to be elevated above the flood level or the use of flood protection features, such as a perimeter flood wall or berm, to maintain the safety function of the plant. Exelon elected to raise the power block grade to achieve the flood protection objective. A flood wall or berm was not considered the preferred option because it would require additional provisions that otherwise would not be needed, such as a pumping system to evacuate stormwater accumulated inside the flood wall, particularly during a local intense precipitation event, special arrangements and/or procedures to accommodate plant access and plant security, and atypical layouts of some plant systems (e.g., the cooling tower system and ventilation system) in order to meet their design objectives.

As described in ER Subsection 9.3.3.1 and depicted in ER Figure 9.3-6, the Matagorda County site is located on the Texas Gulf Coast, approximately 4 miles north of Matagorda Bay, 2 miles east of Tres Palacios Bay and 2.5 miles north of Oyster Lake. Due to its geographic location and the absence of major rivers or streams, dams, reservoirs and water impoundments nearby, flooding mechanisms from external events such as ice effects, probable maximum flooding from streams and rivers, and failures of upstream dams and embankments would not pose a flood risk to plant safety. While tsunami and seiche could be potential flood hazards for some coastal areas, they are not the controlling events for the Texas Gulf Coast, as demonstrated in SSAR Subsections 2.4.5 and 2.4.6. Therefore, the design basis flood event for the Matagorda County site is postulated to be the storm surge resulting from a probable maximum hurricane (PMH), in combination with coincidental wind-wave runup to the plant.

The PMH-induced maximum flood level at the Matagorda County site would consist of three main components:

- Primary surge
- Antecedent water level
- Coincidental wind-wave runup

Primary surge is the combined result of wind and pressure setup and is a function of the hurricane characteristics. NOAA NWS-23 (Schwerdt 1979) defines the PMH characteristics at a site, which includes peripheral pressure, central pressure, lower and upper limits of radius of maximum wind, lower and upper limit of forward speed along the Gulf and Atlantic coasts based on distance (mile post) from the US/Mexico border.

With the PMH characteristics defined, the corresponding storm surge and wind field can be estimated using a coastal storm surge and hydrodynamic model such as "Sea, Lake, and Overland Surges from Hurricanes" (SLOSH) (Jelesnianski 1992). As described in SSAR Subsection 2.4.5, SLOSH was developed by the National Weather Service (NWS) to forecast real-time hurricane storm surge levels on continental shelves, across inland water bodies, along coastlines, and for inland routing of water. SLOSH is a finite difference model that solves a set of equations derived from the Newtonian equations of motion and the continuity equation applied to a rotating fluid with a free surface. It is a depth-average model in that the equations are integrated from the sea floor to the sea surface. The coastline is represented as a physical boundary within the model domain. Bathymetric and topographic data are used to determine a water depth or terrain height for each grid point. Topographic data are obtained from the U.S. Geological Survey (USGS) and are augmented with Light Detection and Ranging (LiDAR) elevations when available; bathymetric data are obtained from NOAA's National Geophysical Data Center (NGDC). Subgrid-scale water features (cuts, chokes, sills and channels), and vertical obstructions (levees, roads, spoil banks, etc.) can be parameterized within the model. The Matagorda County site, as well as the Victoria County Site (VCS), is located within the model grid coverage of the Matagorda Bay SLOSH Basin developed by NWS.

For antecedent water level, the 10 percent exceedance high spring tide including initial rise should be considered for probable maximum storm surge (PMSS) estimation, in accordance with RG 1.59. The 10 percent exceedance high spring tide is defined in ANSI/ANS-2.8-1992 (ANSI /ANS 1992) as the high tide level that is equaled or exceeded by 10 percent of the maximum monthly tides over a continuous 21-year period. For locations where the estimate is from observed data, a separate estimate of

initial rise is not necessary (ANSI /ANS 1992). As indicated in SSAR Subsection 2.4.5, the 10 percent exceedance high spring tide is estimated to be about 3.4 feet NGVD 29 at the coastal location near VCS, based on observed tidal data at Freeport and Corpus Christi, Texas.

The effect of long-term sea level rise would also need to be considered in the determination of the antecedent water level for PMSS. As described in SSAR Subsection 2.4.5, a sea level rise of about 1.8 feet in the next century is postulated for the Matagorda Island shoreline, using long term sea level trend projection by NOAA at the Freeport and Rockport, Texas, tide gage stations.

The PMH wind field would produce coincidental, wind-induced waves and would result in wave runup at the site. Because the maximum wind would approach from the Gulf, the fetch length to produce wind waves would be very large. Wave height at the site is expected to be duration limited or limited by the breaking wave condition at the shore, where the water depth tends to be shallower. The wave characteristics and runup level would be estimated using the methodology described in the USACE Coastal Engineering Manual (CEM) (USACE 2008).

As described in SSAR Subsection 2.4.5.2.2, the predicted PMH surge elevation including the antecedent water level and long term sea level rise is 26.2 feet NGVD 29 (25.8 feet NAVD 88) at the Matagorda Island shoreline near VCS. The Matagorda County site, being in the proximity and 4 miles north (inland) of the Matagorda Bay, is expected to have a PMH surge elevation that would be higher but still on the same order of magnitude. It can therefore be postulated that, for flood protection purpose, the plant grade for the power block to be built at the Matagorda County site would have to be elevated above 26.2 feet NGVD 29 (25.8 NAVD 88) to account for the additional increase in PMSS level as a result of coincidental wind-wave runup, which could be on the order of 10 feet or higher. Based on the results of the preliminary flooding evaluation, Exelon used an estimated design basis flood elevation of approximately 37 feet in its assessment of the Matagorda County site.

Matagorda County and VCS Site Rescoring

Exelon submitted the Project Green Nuclear Power Plant Site Selection Report (siting report) to the NRC via letter NP-12-0007, dated February 15, 2012. As described in the siting report and ER Subsection 9.3.2, Exelon followed the process outlined in the EPRI *Siting Guide* (EPRI *Siting Guide: Site Selection and Evaluation Criteria for an Early Site Permit Application*) to determine a composite suitability rating for the Victoria County, Matagorda County, Buckeye, Alpha, and Bravo sites. Exelon used criteria developed from the EPRI general criteria to evaluate the five candidate sites in the categories of Health and Safety, Environmental, Transmission and Market Analysis, Local Government and Community Support, Economic Development Incentives (Total Differential Cost), Communications, and Socioeconomics (presented in the order of importance to the overall score, based on the assigned weighting factors). The Matagorda County site ranked highest in Health and Safety and overall composite suitability ranking after the initial scoring. The Victoria County site scored second in Health and Safety and was the highest ranked Environmental site.

Based on the composite suitability ratings, the Matagorda County site was initially selected as the preferred site (see ER Figure 9.3-4). The Victoria County and Buckeye sites were deemed "too close to call", resulting in the completion of a second scoring

process to determine which would be designated as the secondary site. Given that an array of factors was used to arrive at the composite suitability ratings, newly identified costs (15% weight) and construction risk (85% weight) were used as unique differentiators in the supplemental scoring exercise. The Victoria County site scored higher on these factors and was thus designated the secondary site.

Shortly thereafter, Exelon commenced site characterization studies at the Matagorda County and Victoria County sites, focusing on safety-related issues that could render either site unsuitable for a commercial nuclear plant. Meteorological towers were erected and geotechnical boring campaigns began at both sites. Onsite surveys and engineering studies also commenced at the Matagorda County site to support the expected preparation of a 10 CFR Part 52 licensing application. Additionally, discussions began with the Guadalupe-Blanco River Authority (GBRA) regarding the availability of water rights in the Guadalupe-San Antonio River Basin for a potential power plant at the Victoria County site. During this period, Exelon engaged several state and local agencies to discuss potential issues at the primary and secondary sites.

The following bullets summarize relevant findings from the preliminary onsite investigations, engineering studies, and agency discussions:

- As discussed earlier in the Part (a) response, Exelon used an estimated design basis flood elevation of approximately 37 feet in its assessment of the Matagorda County site, based on the results of the preliminary flooding evaluation. Raising the site 25 feet or more (i.e., from the existing grade of around 10 feet to the preliminary design basis flood elevation) for flood protection would result in the need to import significant amounts of structural fill, which is not immediately available in the site vicinity. Potential project impacts included additional transportation-related environmental effects (see response Part b) and greater construction cost / risk. The preliminary design basis flooding evaluation was unfavorable with respect to the flooding and overall cost differential criteria.

- The depth of groundwater at the Victoria County site was confirmed to be approximately 40 to 50 feet below ground surface (see ER Table 2.3.1.2-3, October 2007), which was favorable with respect to the groundwater radionuclide transport criterion.

- The preliminary design of the non-safety cooling system was selected for the Matagorda County site, with the cooling water intake structure (CWIS) located on the Gulf Intracoastal Waterway (GIWW). As a result, concerns were raised over repeatedly disturbing sediment in the GIWW during maintenance dredging around the CWIS and barge offload facilities. This development was unfavorable with respect to the dredging / disposal effects criterion.

- Discussions with the GBRA yielded a better understanding of water availability and costs for the Victoria County site, which was favorable with respect to the cooling system requirements criterion.

- Submittal of the South Texas Project, Units 3 and 4, Combined License Application in September 2007 resulted in changes to the projected transmission and market conditions in east ERCOT, with the western load centers (San Antonio, Austin, and Corpus Christi) expected to be more favorable markets for the competitive sale of electricity from Exelon's merchant generation project. Given the locations of the

Victoria County and Matagorda sites relative to these load centers (i.e., Victoria is closer), the original advantage of the Matagorda County site in the Transmission and Market Analysis criteria category was significantly diminished.

- Preliminary discussions with the Texas Commission on Environmental Quality (TCEQ) yielded no major concerns for either site. Local officials indicated overwhelming support for both locations. The US Army Corps of Engineers (USACE) indicated that some or all of the rice fields on the Matagorda County site could constitute farmed or prior converted wetlands. Exelon did not identify data from the Natural Resources Conservation Service (NRCS) confirming the presence of farmed or prior converted wetlands at the Matagorda County site. Although not definitive, the apparent lack of documentation regarding farmed or prior converted farmlands was viewed as favorable for the Matagorda County site with respect to the potential dewatering effects on adjacent wetlands criterion.

- Geotechnical borings at the Matagorda County site indicated the presence of soft clays, which would be expected to reduce bearing capacity, increase the potential for settlement, and degrade ground motion response. These factors would increase the depth of over-excavation in the power block area and the potential for settlement of the fill that would be required to raise the site for flood protection, resulting in the need to import additional quantities of structural fill. Potential project impacts included additional transportation-related environmental effects and greater construction cost / risk. Preliminary borings conducted at the Victoria County site did not indicate the presence of poor soils. The presence of soft clays at the Matagorda County site was unfavorable with respect to the total differential cost criterion.

Based on new information collected during the initial investigations, Exelon decided to reevaluate the composite suitability rankings for the Matagorda County and Victoria County sites. Using previously collected and newly available data, Exelon rescored the sites in the categories included in the original scoring process. Exelon avoided adding new categories in the rescoring effort to ensure that the updated scores would be comparable to the original scores and consistent with their underlying methodology. Table 1 summarizes the original and updated scoring by criteria category.

Table 1. Original and Updated Composite Suitability Scoring by Criteria Category

	Original Scoring			Updated Scoring		
Criteria Category	Victoria County	Matagorda County	Delta	Victoria County	Matagorda County	Delta
Health and Safety	600.82	648.4	-47.58	639.87	636.63	3.24
Environmental	612.67	484.62	128.05	613.4	481.09	132.31
Transmission and Market Analysis	475.8	702	-226.2	553.8	585	-31.2
Local Government and Political Support	624	546	78	624	546	78
Total Differential Costs	550.57	760	-209.43	760	718.67	41.33
Communications	544	544	0	544	544	0
Socioeconomics	306.31	327.47	-21.16	306.31	327.47	-21.16
Total composite suitability score	**3714**	**4012**	**-298**	**4041**	**3839**	**203**
Total without costs	**3164**	**3252**	**-89**	**3281**	**3120**	**161**

Notes

1. Higher score is better
2. Positive delta and yellow shading indicate advantage for Victoria County site
3. Negative delta and green shading indicate advantage for Matagorda County site

Table 1 indicates the following with respect to the updated scoring:

- Health and Safety: the updated rank was reversed from the original scoring;
- Environmental: the Victoria County site remained higher in the Environmental category, with a slightly increased margin;
- Transmission and Market Analysis: the Matagorda County site remained higher in this category, but the delta between the sites was significantly narrowed;
- Local Government and Political Support: no change from original scoring;
- Total Differential Costs: rank is reversed from original scoring;
- Communications: no change from original scoring;
- Socioeconomics: no change from original scoring;
- Total Composite Suitability Rating: the Victoria County site had a higher composite suitability rating than the Matagorda County site after the scoring update, both with and without the inclusion of Total Differential Costs.

As discussed above, Table 1 indicates that the Victoria County site had a higher composite suitability rating than the Matagorda County site after the rescoring process. ER figure 9.3-5 presents the updated scores in graphic form. Comparing the revised Victoria County score in Figure 9.3-5 to the original scores presented in ER Figure 9.3-4 for the five candidate sites, it can be seen that the Victoria County site had the highest

overall composite suitability rating. Accordingly, the Victoria County site was designated as the Preferred Site

Part (a) Response References:

ANSI /ANS 1992. American National Standards Institute /American Nuclear Society, *American National Standard for Determining Design Basis Flooding at Nuclear Reactor Sites*, ANSI/ANS-2.8-1992, 1992

Jelesnianski 1992. Jelesnianski, C. P., et al., *SLOSH: Sea, Lake, and Overland Surges from Hurricanes*, NOAA Technical Report NWS 48, April 1992

Schwerdt 1979. Schwerdt, R. W., et al., *Meteorological Criteria for Standard Project Hurricane and Probable Maximum Hurricane Windfields, Gulf and East Coast of the United States, National and Atmospheric Administration (NOAA) Technical Report NWS 23*, U.S. Department of Commerce, September 1979

USACE 2008. U.S. Army Corps of Engineers, Coastal Engineering Manual, Available at http://chl.erdc.usace.army.mil/chl.aspx?p=s&a=ARTICLES;104, accessed April 6, 2008

RAI Part (b) Response:

Exelon evaluated the flooding potential of the VCS site and the alternative sites, as applicable. The three sites evaluated are VCS, Matagorda County, and Buckeye.

The Bravo site was excluded from the flooding evaluation as it was determined the powerblock did not need to be elevated. The Bravo site has a proposed powerblock elevation of 340 feet and a 100-yr flood elevation of 300 feet based on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM# 48213C0300E Panel 300). Therefore, it is assumed that the Bravo site will not require any increase to the powerblock elevation for flood protection.

The Alpha site was excluded from the flooding evaluation as it was determined the powerblock did not need to be elevated. The Alpha site has a proposed power block elevation of 143 feet and a 100-yr flood elevation of 110 feet based on the FEMA Flood Insurance Rate Map (FIRM# 48015C0425E Panel 425E). The Brazos River Authority estimates the high water level of the Allens Creek Reservoir at elevation 121 feet (BRA undated). The design basis flood for the Alpha site is assumed to originate from the breach of the Allens Creek Reservoir; therefore, 121 feet is used as the design basis flood and the minimum powerblock grade elevation. It is assumed that the Alpha site will not require any increase to the powerblock elevation for flood protection.

Exelon estimated the powerblock elevation at the VCS site and the alternative sites based on the estimated design basis flood elevation.

- VCS – The proposed VCS powerblock elevation is 95 feet. As discussed in SSAR Section 2.4.4.3.2, the predicted maximum water level at the powerblock area resulting from a breach of the cooling basin embankment is approximately 91 feet - 4 feet below the proposed finished grade for the powerblock area.

- Matagorda County – As discussed in the response to part (a) of this RAI, for flood protection, the powerblock would have to be elevated above approximately 26 feet (the predicted PMH surge elevation) plus an additional 10 feet or higher to account for the additional increase in PMSS level as a result of coincidental wind-wave run-up. The Matagorda County site powerblock elevation is estimated at 37 feet for the purpose of the flooding evaluation presented herein.

- Buckeye – The design basis flood for the Buckeye site is assumed to originate from the breach of the cooling basin. Based on the expected water level elevation in the Buckeye site cooling basin of 51 feet, the minimum powerblock grade elevation is estimated at 53 feet to protect from flooding in the event of a breach of the cooling basin embankment.

Exelon then estimated the general and structural fill that would be required to account for over-excavation and to raise the safety-related systems, structures, and components located in the powerblock to an elevation above the estimated design basis flood elevation. Table 1 summarizes the fill information.

Table 1. Site Fill Summary

Description	Victoria County	Matagorda County	Buckeye
Over-Excavation Structural Fill (CYIP)	2,430,000	2,430,000	2,430,000
Powerblock General Fill (CYIP)	170,000	370,000	210,000
Above Existing Grade Structural Fill (CYIP)	410,000	750,000	490,000
Powerblock Total Fill (CYIP)	3,010,000	3,550,000	3,130,000
Powerblock Total Fill (tons)[a]	4,816,000	5,680,000	5,008,000

CYIP = cubic yards in place (compacted)
a. Assumes 1.6 tons per CYIP.

Potential offsite sources for structural fill material were identified along with routes for transporting the fill material to the sites. Truck transport of fill material was assumed for all of the sites. Average transport distances were estimated for three potential fill sources at each site. One-third of the fill material was assumed to originate from each of the three potential sources. Table 2 summarizes the estimated powerblock fill amounts requiring transportation on public roadways for each site.

Table 2. Powerblock Fill Transport Summary

Description	Victoria County [b]	Matagorda County	Buckeye
Total Powerblock Fill Requiring Transport on Public Roadways (tons)	3,216,000	5,680,000	5,008,000
Daily Truck Trips[a]	309	546	482
Average Two-Way Travel (miles)	55	140	120
Total Truck Miles on Public Roadways	8,844,000	39,760,000	30,048,000
Ratio of Truck Miles to VCS Transport	1	4.5	3.4

a. Assumes the structural fill material is delivered over a 2-year period.
b. One-third of the VCS fill is assumed to be obtained from the Fordyce Sand and Gravel pit located adjacent to the proposed Victoria County Navigation District (VCND) transportation corridor, eliminating the need for transport on public roadways

The estimated total powerblock fill requirements would be similar for each site. For the VCS site, fill material could be obtained from sources near the site (average haul distance less than 30 miles). This reduces the average transport distance and reduces transportation-related indirect effects (e.g., vehicle emissions) from the delivery of fill to the VCS site. For the Matagorda County and Buckeye sites, the transport distances would be more than twice that for the VCS site. Indirect effects such as vehicle emissions would be proportional to the total truck miles. The indirect effects from the transport of fill to the Matagorda County and Buckeye sites would be greater by a factor or 4.5 and 3.4, respectively, than those associated with transport of structural fill to the VCS site.

Traffic related impacts for each of the sites are summarized below.

- VCS – As described in ER Section 4.4.2.2.4, the average annual traffic count is approximately 16,300 vehicles per day[1] on U.S. Highway 77 north of the VCS site. The peak shift change would add 6182 vehicles on the road because of the construction workforce to the estimated traffic count of 1630 vehicles per hour for a total of 7812 vehicles. U.S. Highway 77 would not exceed its threshold capacity of 11,800 passenger cars per hour. The estimated 309 daily truck shipments of structural fill would contribute to congestion on nearby roads but would not alter the projected SMALL transportation impacts during construction.

- Matagorda County – As discussed in ER Section 9.3.3.1.6.5, the average annual traffic count is approximately 125 vehicles per day on Farm-to Market (FM) 1095 and likely lower on County Road (CR) 3221. The peak construction shift change would add 6182 vehicles on the road, which exceeds the threshold capacity of 2300 passenger cars per hour for FM 1095. The estimated 546 daily truck shipments of structural fill would contribute to congestion on nearby roads and to the projected MODERATE to LARGE transportation impacts during construction.

[1] In evaluating road capacity, the Texas Department of Transportation considers tractor trailers as equivalent to three passenger vehicles. Smaller trucks such as concrete trucks and other delivery trucks are considered the equivalent of two passenger vehicles. Each projected truck shipment of fill would be equivalent to two additional vehicles on the roadway.

- Buckeye –As discussed in ER Section 9.3.3.2.6.5, the average annual traffic count is approximately 750 vehicles per day on FM 1468 and approximately 6700 along TX 35. The peak construction shift change would add 6182 vehicles on the road, which exceeds the threshold capacities of 2300 and 4200 passenger cars per hour, respectively, for FM 1468 and TX 35. The estimated 482 daily truck trips would contribute to congestion on nearby roads and to the projected MODERATE to LARGE transportation impacts during construction.

Table 3 provides estimates for potential accidents, fatalities, and injuries associated with transport of the powerblock and cooling basin fill material. Saricks and Tompkins (1999) provide incident rates that are representative of heavy-truck accidents. In recent transportation analyses, NRC noted that the data used by Saricks and Tompkins were underreported (NRC 2010, NRC 2011) and derived factors to compensate for that underreporting. The composite accident, fatality, and injury rates for Texas obtained from Saricks and Tompkins (1999) were adjusted by factors of 1.64, 1.57 and 1.20, respectively, derived by NRC.

Table 3. Impacts of Transporting Fill Material

Parameter	Victoria County	Matagorda County	Buckeye
Total Truck Miles on Public Roadways	8,844,000	39,760,000	30,048,000
Total Accidents	15	69	52
Total Fatalities	0.60	2.7	2.1
Total Injuries	9.2	41	31

Exelon considered other potential impacts associated with actions necessary to overcome flooding at VCS and the alternative sites.

- Land Use Impacts – The fill material is assumed to be available from existing sources. Small land use impacts would be expected from the acquisition of this material from existing borrow sites.

- Water Quality Impacts – At each site, measures would be taken to prevent impacts to surface or groundwater quality similar to those for the VCS site described in ER Section 3.9.1.12. Slope protection and temporary ground support systems would be installed during excavation. Swales and/or dikes would be constructed around the excavation areas to prevent surface water/runoff from entering the excavation work area. Drainage sumps and/or temporary well points would be installed at the bottom of the excavations from which surface drainage and/or accumulated groundwater would be pumped to a stormwater discharge point that pipes the water to detention ponds to filter out turbidity and solids. Stormwater detention ponds would be provided.

- Ecological Impacts – The fill material is assumed to be available from existing sources. Small ecological impacts would be expected from the acquisition of this material from existing borrow sites.

- Environmental Justice – Because the impacts are generally small, there would be no disproportionately high and adverse impact on low-income or minority

populations. Exelon would avoid transportation routes that would disproportionately affect low-income or minority populations.

- Physical Impacts – Persons along the roadways would be affected by increased noise associated with delivery of fill material to the sites Traffic would increase along nearby roadways and traffic related effects (noise, dust emissions) would be more noticeable for sites such as Matagorda County that are served by smaller roadways with low traffic volumes. The effects could be greater for the Matagorda County and Buckeye sites if proposed construction of new reactors at the South Texas Project site were to occur in the same timeframe.

- Greenhouse Gases – Information related to potential greenhouse gas emissions will be provided in response to RAI 6453, MET-3 (NRC RAI Letter No. 14).

Part (b) Response References:

BRA undated. Brazos River Authority (BRA) Website FAQs Section: http://www.brazos.org/acrFAQs.asp.

NRC 2010. Draft Environmental Impact Statement for Combined Licenses (COLs) for Levy County Nuclear Plant Units 1 and 2, NUREG-1941, August 2010.

NRC 2011. Draft Environmental Impact Statement for Combined License (COL) for Enrico Fermi Unit 3, NUREG-2105, October 2011.

Saricks and Tompkins 1999. Saricks, C.L. and Tompkins, M.M., *State-Level Accident Rates of Surface Freight Transportation: A Reexamination, Argonne National Laboratory*, U.S. Department of Energy, April 1999.

Associated ER revisions:

There are no ER changes associated with Part (a) or Part (b) of the response.

CR-1 (eRAI No.6429):

NRC Request:

CR -1 ESRP Sections 4.1.3 and 5.1.3 state that the environmental impact statement (EIS) needs to consider all of the effects from the project on historic and cultural resources. Additionally, the National Historic Preservation Act of 1966, as amended (36 CFR 800) requires that Federal agencies consider the effect of undertakings on historic properties. 36 CFR 800.5(a)(i) states that cumulative effects can result in adverse effects to historic properties. Therefore, cumulative impacts from past, present, and reasonably foreseeable future actions must be considered. The current environmental report (ER) does not address the cumulative effect of the project on historic and cultural resources. Provide an analysis of the cumulative effects from the proposed action on historic and cultural resources.

Response:

Sections 2.5.3, 4.1.3, and 5.1.3 of the ER describe the cultural resources of the proposed VCS project and the potential of the project to impact those resources. The following discussion is organized by the types of cultural resources identified for the proposed VCS project.

Archaeological Resources
The VCS site, which includes all the proposed VCS facilities, has no National Register of Historic Places-eligible archaeological sites. Thus, there would be no impacts to archaeological sites onsite from the proposed VCS facilities. The Raw Water Makeup (RWMU) pipeline and cooling water blowdown pipeline corridors have not been surveyed, and will not be surveyed until COL application stage, as described in ER Section 2.5.3.3.3. Therefore, the impacts to archaeological sites are not known. Although there are no previously recorded archaeological sites within the routes of these corridors, the corridors are located in topographical locations (Guadalupe and San Antonio river valleys) where archaeological sites have been found. The specific corridors for the transmission lines have neither been defined nor archaeologically surveyed. Thus, impacts to archaeological sites from the transmission lines also are not known. It is also anticipated that the Victoria County Navigation District (VCND) transportation corridor will undergo archaeological survey by the District. Based on the lack of significant archaeological resources at the VCS site, there would be no cumulative impacts to archaeological resources. Exelon has committed to conducting Phase I archaeological surveys of the offsite corridors at the COL stage, which will allow a more accurate assessment of cumulative impacts for the VCS project.

McFaddin Ranch Rural Historic Landscape (RHL)
The VCS site comprises the McFaddin Ranch RHL, which has been determined NRHP-eligible. The proposed VCS would result in LARGE adverse effects to this RHL through physical disturbance of the contributing elements (individual ranching and petroleum industry features and the natural landscape) and introduction of visual elements out of character with the property and its setting. The pipeline corridors and transmission line corridors are outside of the recorded RHL. Thus, they would not physically disturb the RHL; however, the transmission lines would likely have an added visual impact on the property and its setting, dependent on the location of the support structures.

Existing infrastructure or future projects in the vicinity of the VCS site that have or would introduce visual elements to the area that are inconsistent with the RHL's historic setting, feeling, and association would combine with the VCS project to maintain a LARGE adverse cumulative impact to the RHL. Currently there are cell towers, powerlines, and a four-lane, divided highway that have provided some adverse visual effect to the setting. Of the known planned projects considered for potential cumulative impacts, only the VCND transportation corridor would add to the adverse effect. The locations of the other projects are sufficiently distant that they would not add to the visual effect to the RHL setting. Also, depending on their location, possible transmission line corridors associated with other new energy development projects in the vicinity of the RHL would also have the potential to add to the cumulative adverse effect.

Historic Buildings and Structures

Although the visual impacts on the 38 individual historic properties located offsite would vary, the combined impacts of construction and operation of the VCS would be LARGE and would warrant mitigation Thirty-six of the properties are located within the town of McFaddin adjacent to the VCS southern boundary. The other two are located within a mile north of the northern boundary of the VCS site. The pipeline corridors would not have an effect on these properties because the pipelines would not pass through them and are underground. The transmission lines would likely have a visual impact on the properties and their settings dependent on the location of the support structures in relation to the properties.

Existing infrastructure or future projects in the vicinity of the VCS site that have or would introduce visual elements to the area that are inconsistent with the historic properties' setting would combine with the VCS project to maintain a LARGE adverse cumulative impact to the historic properties. Currently there are cell towers, powerlines, and a four-lane, divided highway that have provided some adverse visual effect to the settings. Of the known planned projects considered for potential cumulative impacts, only the VCND transportation corridor has the potential to add to the adverse effect for the properties located north of the VCS site, though this cannot be determined until specific plans are in place and an appropriate assessment can be performed. The locations of the other projects are sufficiently distant that they would not add to the visual effect on the setting of the 38 historic properties. Also, depending on their location, possible transmission line corridors associated with other new energy development projects in the vicinity of the historic properties would also have the potential to add to the cumulative adverse effect.

Associated ESPA Revisions:

There are no ER changes associated with this response.

CR-2 (eRAI No.6429):

NRC Request

CR-2 ESRP Sections 4.1.3 and 5.1.3 state that the EIS needs to consider all of the effects from the project on historic and cultural resources. Additionally, the National Historic Preservation Act of 1966, as amended (36 CFR 800) requires that Federal agencies consider the effect of undertakings on historic properties. Several additional activities are proposed (e.g. intake/discharge structures, pipelines, a transportation corridor, and the heavy haul road) that may extend onto the floodplain of the Guadalupe River. The ER does not discuss the types of resources that could be found on the floodplain nor the potential effect that could result from these activities. A discussion of the types of archaeological resources that have been found in the past along the river in the area is requested. Please include a discussion of historic and cultural resources that have been found on this landform in the region. 36 CFR 800.5(a)(i) states that cumulative effects can result in adverse effects to historic properties. All direct, indirect, and cumulative effects on historic properties from the project need to be understood and disclosed. Please provide a discussion of the potential effects on historic and cultural resources that could result from building and operating intake/discharge structures, pipelines, the transportation corridor, and the heavy haul road on the floodplain. Include a discussion of the types resources found along the Guadalupe River and the Victoria Barge Canal. Describe what resources, if any are known, could be affected by building the intake/discharge structures, pipelines, a transportation corridor, and the heavy haul road.

Response:

As part of the Phase Ib archaeological investigations conducted for the Victoria County Station (VCS) property, review of previously conducted archaeological investigations and previously recorded archaeological sites within a 20-mile radius of the property was conducted and presented in the Phase Ib report (Tinsley 2010). The 20-mile radius covers the possible areas in which offsite pipelines, intake/discharge structures, and Victoria County Navigation District (VCND) transportation corridor would be located. The results show that there has been a limited amount of archaeological survey and site excavation work conducted in the lower Guadalupe River Valley.

Based on this body of work, it is evident that the valley and valley margins in the region of the VCS project have been used by various populations from the Early Archaic through to Historic times. In general, Pleistocene terrace remnants are the likely locations for sites, which would have provided protection in the floodplain of the river system, and in turn would have provided a higher probability of preserving archaeological deposits. A few large sites along the valley show long periods of occupation and use, from Early Archaic (ca. 2200 B.C.) through Late Archaic (ca. A.D. 1000) times. These sites, along with smaller ones in the region, show a focus on exploitation of estuary resources, and often contain large shell middens, burials and sometimes cemeteries, and artifacts including lithics, bone tools, and ceramics. In the Late Prehistoric, there appears to be a shift away from estuary resources, as middens become fish-rich and eventually show concentrations of deer and bison remains. Early Historic Period sites (ca. A.D. 1700-1800) also show evidence of indigenous interaction with colonial Spanish settlers by the presence of Spanish artifacts. Historic use of the floodplain by Europeans seems confined to the upper valley margins, ostensibly to

reduce the risk of flood damage to homesteads. These homesteads would typically consist of a primary dwelling, several outbuildings, and livestock pens and corrals.

The heavy haul road is located within the VCS plant site, which has undergone archaeological investigations. These investigations show that no archaeological resources would be impacted by this piece of infrastructure (Tinsley 2010).

Because there have been no archaeological investigations of the intake/discharge structures, pipelines, and transportation corridor, it is currently unknown if any sites are located within the construction and operation areas for these features. There are no previously recorded archaeological resources within the construction and operations areas of these pieces of infrastructure.

Geoarchaeological and geomorphological work conducted for the VCS project and reported in the Phase Ia report indicate that the portions of the landscape with the greatest potential for buried cultural material include Pleistocene terrace remnants, floodplains of lower-order tributaries, alluvial fans, colluvial toe-slopes at valley margins and within incised stream valleys, and knolls on sandy valley margins (Peter and Prior 2008). The intake/discharge structures, pipelines, and transportation corridor would extend from the plant site to the Guadalupe River, and in the case of the Raw Water Makeup (RWMU) system, would also extend into the San Antonio River valley. Based on the geoarchaeological and geomorphological information, and the pattern of locations of previously recorded archaeological sites, there is the potential that significant archaeological resources could be located within the currently proposed construction and operation areas of these offsite corridors.

As described in ER Section 2.5.3.3.3, Exelon has committed to conducting Phase I archaeological surveys for the offsite intake/discharge structures and pipeline corridors at the COL application stage. If significant archaeological resources are identified within the construction areas associated with the intake/discharge structures and pipelines, Exelon would evaluate options for avoidance and mitigation of impacts to the potentially affected resources. In the case of the RWMU intake pipelines, Exelon has evaluated three potential routes, providing routing flexibility. The VCND and transmission service provider would be expected to survey the transportation corridor and transmission line routes, respectively, at the COL stage and evaluate the means of avoiding and mitigating potential impacts. Operations activities associated with the offsite infrastructure, including maintenance and repair, would be expected to occur within the areas previously disturbed during construction activities, and thus, would be expected to have a small effect on these resources.

References:

Peter, Duane E., and Dr. Marsha Prior, eds. 2008. Phase Ia Investigations of the Proposed Site for Victoria County Station, Units 1 and 2, Victoria County, Texas: Preliminary Analysis of Historic Property and Impact Potential. Geo-Marine Inc., Plano, Texas. April 2008.

Tinsley, Clayton R. 2010. Phase Ib Investigations of the Proposed Site for Victoria County Station, Units 1 and 2, Victoria County, Texas; Volume I: Archaeological, Geoarchaeological, and Geophysical Investigations. Geo-Marine Inc., Plano, Texas. February 2010.

Associated ESPA Revisions:

There are no ER changes associated with this response.

CR-3 (eRAI No.6429):

NRC Request:

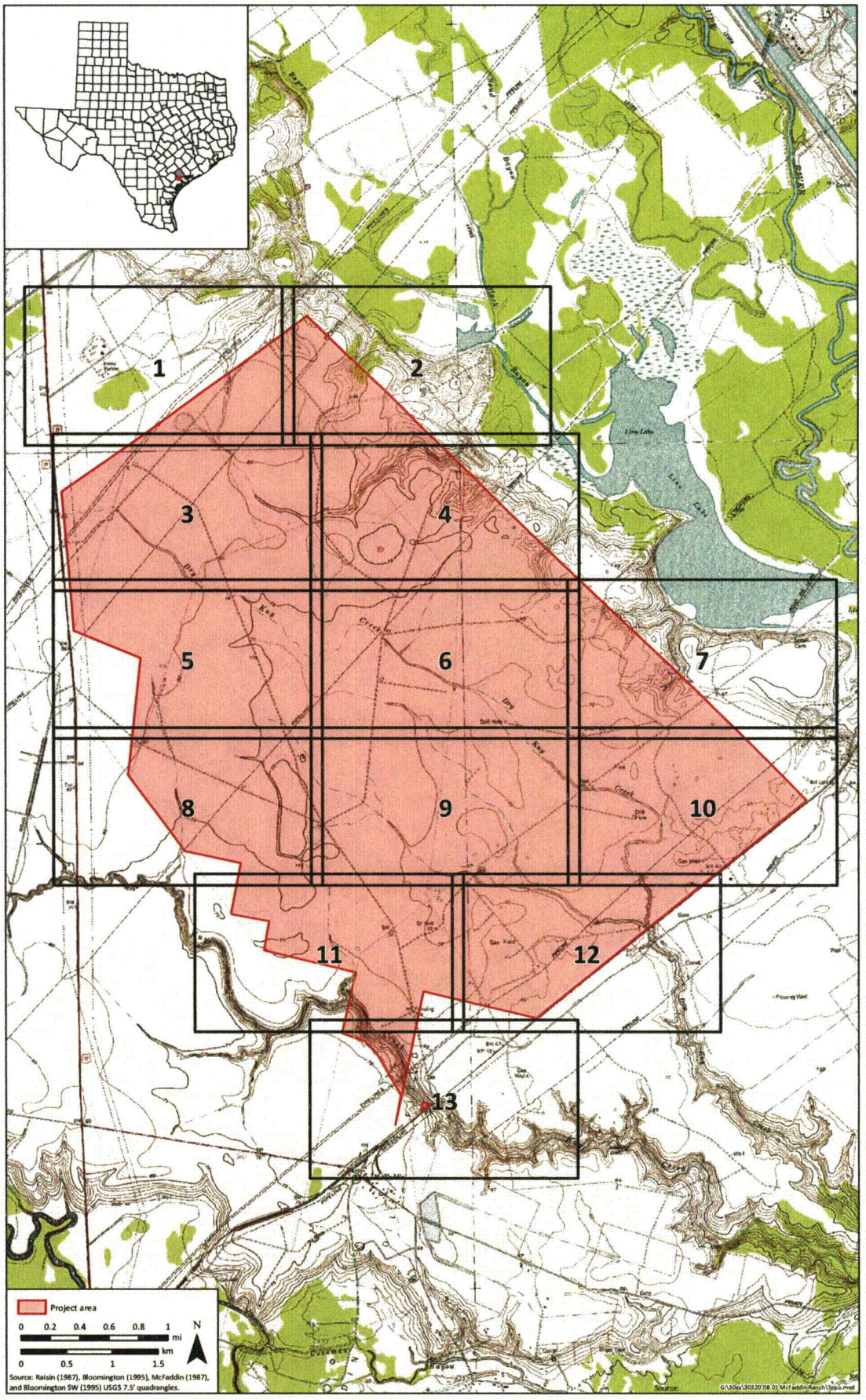
CR-3 ESRP Sections 4.1.3 and 5.1.3 state that the EIS needs to consider all of the effects from the project on historic and cultural resources. Additionally, The National Historic Preservation Act of 1966, as amended (36 CFR 800) requires that Federal agencies consider the effect of undertakings on historic properties. 36 CFR 800.4, "Identification of historic properties," requires that the agency identify what resources could be affected by the undertaking. Resources located on the property could be affected if a nuclear power plant is built. The spatial distribution of these resources may affect the nature of the project's effects. Provide a map showing the location of all significant resources including the contributing properties to the McFaddin Ranch Rural Historic Landscape which was designated by the Texas Historical Commission (THC) on the VCS property.

Response:

The Texas Historic Commission concurred that the eight archaeological resources (5 sites and 3 localities) identified on the property are not eligible for listing on the National Register of Historic Places. Thus, the only significant resources (i.e., historic properties) on the property are the contributing resources to the McFaddin Ranch Rural Historic Landscape. The attached includes a table of the contributing resources keyed to 13 maps (also attached) of the McFaddin Ranch Rural Historic Landscape.

Associated ESPA Revisions:

There are no ER changes associated with this response.



McFaddin Ranch within APE.

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MCFADDIN RANCH CONTRIBUTING RESOURCES WITHIN APE

Symbol	Resource Type	Construction Date	Relevant Historic Context	Integrity	NRHP Eligibility Recommendation	Eligibility Criteria	Assessment of Effect
	Road Network	1930-1968	Cattle Ranching; Oil & Gas Industry	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Culvert 1	Ca. 1955	Cattle Ranching; Oil & Gas Industry	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Culvert 2	Ca. 1965	Cattle Ranching; Oil & Gas Industry	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Road Bridge 1	Ca. 1950	Cattle Ranching; Oil & Gas Industry	Retains integrity	Contributing	A: Association with Events	Adverse
	Water Feature 1	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Water Feature 2	Ca. 1960	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Water Feature 5	not applicable	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Water Feature 6	Ca. 1965	Cattle Ranching; Oil & Gas Industry	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Water Feature 7	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Water Feature 9	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Water Feature 10	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Water Feature 13	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Water Feature 15	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Water Feature 16	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Water Feature 18	Ca. 1960	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Water Feature 19	Ca. 1960	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Water Feature 20	Ca. 1960	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Railroad Crossing 1	Ca. 1930	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Wind Break 1	Ca. 1945	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Wind Break 2	Ca. 1945	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Wind Break 3	Ca. 1945	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Wind Break 4	Ca. 1945	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Wind Break 5	Ca. 1945	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Wind Break 6	Ca. 1945	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Wind Break 7	Ca. 1945	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Wind Break 8	Ca. 1945	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Gate 8	Ca. 1960	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Gate 11	Ca. 1965	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse

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	Old Gatepost 1	Ca. 1960	Cattle Ranching	Lacks integrity of materials, workmanship, and design	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Cattle Guard 2	Ca. 1960	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Barbed Wire Fence 1	Ca. 1960	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Barbed Wire Fence 15	Ca. 1965	Cattle Ranching	Lacks integrity of workmanship and materials	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Post and Wire Fence 1	Ca. 1960	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Relict Fence 1	Ca. 1960	Cattle Ranching	Lacks integrity of materials and workmanship	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Relict Fence 2	Ca. 1960	Cattle Ranching	Lacks integrity of materials and workmanship	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Corrals and Pens (Ranch Foreman Complex)	Ca. 1965	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Livestock Shelter 1	Ca. 1960	Cattle Ranching	Lacks integrity of materials and workmanship	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Livestock Shelters and Barns (Ranch Foreman Complex)	Ca. 1965	Cattle Ranching	Dwelling lacks integrity of location (moved from Victoria)	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Windmill 2	Ca. 1960	Cattle Ranching	Lacks integrity of materials and workmanship	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Cistern 1	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Cistern 2	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Cistern 3	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Cistern 4	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Cistern 5	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Cistern 6	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Cistern 7	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Cistern 8	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Cistern 9	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Cistern 10	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Cistern 11	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Cistern Site 1	Ca. 1940	Cattle Ranching	Lacks integrity of materials and workmanship	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Cistern Site 2	Ca. 1940	Cattle Ranching	Lacks integrity of materials and workmanship	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Water Trough 2	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Water Trough 3	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Water Trough 4	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Water Trough 6	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Water Trough 7	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Water Trough 9	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse

	Water Trough 10	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Water Trough 11	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Water Trough 12	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Water Trough 13	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Water Trough 14	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Water Trough 15	1935 (date on trough)	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Water Trough 16	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Water Trough 17	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Water Trough 19	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Water Trough 20	Ca. 1940	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Creek 1	not applicable	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Creek 2	not applicable	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Creek 3	not applicable	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Creek 4	not applicable	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Creek 5	not applicable	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Creek 6	not applicable	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Creek 7	not applicable	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Creek 8	not applicable	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Creek 9	not applicable	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Creek 10	not applicable	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Creek 11	not applicable	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Creek 12	not applicable	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Wetland 1	not applicable	Cattle Ranching	Retains integrity	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Dwelling (Ranch Foreman Complex)	Ca. 1940	Cattle Ranching	Lacks integrity of location	Contributing	A: Association with Events; B: Association with Significant Individuals	Adverse
	Historic Pipeline Corridor 1	Ca. 1950	Oil & Gas Industry	Retains integrity	Contributing	A: Association with Events	Adverse
	Historic Pipeline Corridor 2	Ca. 1950	Oil & Gas Industry	Retains integrity	Contributing	A: Association with Events	Adverse
	Xmas Tree 4/ Well Head 4	Ca. 1965	Oil & Gas Industry	Lacks integrity of materials, workmanship, and design	Contributing	A: Association with Events	Adverse
	Xmas Tree 16/ Well Head 16	Ca. 1965	Oil & Gas Industry	Retains integrity	Contributing	A: Association with Events	Adverse
	Xmas Tree 17/ Well Head 17	Ca. 1965	Oil & Gas Industry	Retains integrity	Contributing	A: Association with Events	Adverse
	Manifold 4	Ca. 1965	Oil & Gas Industry	Retains integrity	Contributing	A: Association with Events	Adverse

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	Manifold 5	Ca. 1965	Oil & Gas Industry	Retains integrity	Contributing	A: Association with Events	Adverse
	Manifold 6	Ca. 1965	Oil & Gas Industry	Retains integrity	Contributing	A: Association with Events	Adverse
	Orifice Meter 4	Ca. 1965		Retains integrity	Contributing	A: Association with Events	Adverse
	Miscellaneous Pipe Vent 1	Ca. 1965	Oil & Gas Industry	Retains integrity	Contributing	A: Association with Events	Adverse
	Abandoned Tank 2	Ca. 1965	Oil & Gas Industry	Lacks integrity of association	Contributing	A: Association with Events	Adverse
	Well 1	Ca. 1965	Oil & Gas Industry	Retains integrity	Contributing	A: Association with Events	Adverse
	Abandoned Well 1	Ca. 1965	Oil & Gas Industry	Lacks integrity of workmanship and design	Contributing	A: Association with Events	Adverse
	Abandoned Well 2	Ca. 1960	Oil & Gas Industry	Lacks integrity of materials and association	Contributing	A: Association with Events	Adverse


Kempner City Rd 5
US Hwy 77
Rumsey Rd
Barbed Wire Fence 1
Cattle Guard 2
Project area
Road
Water
N
0 200 400 600 800 1,000
ft
0 100 200 300
m
Source: NAIP 2010; NHD; TNRIS Roads

Map 1

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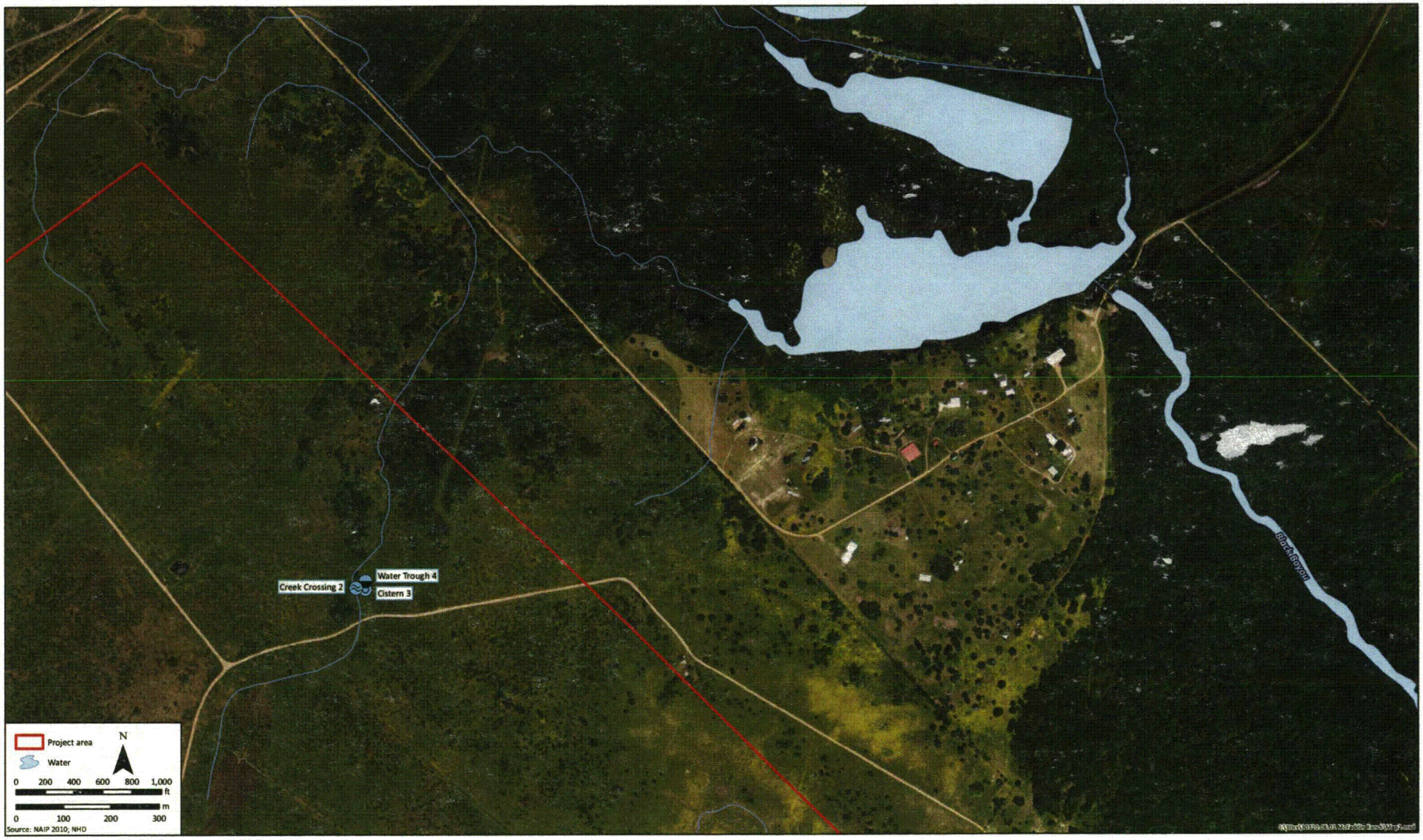
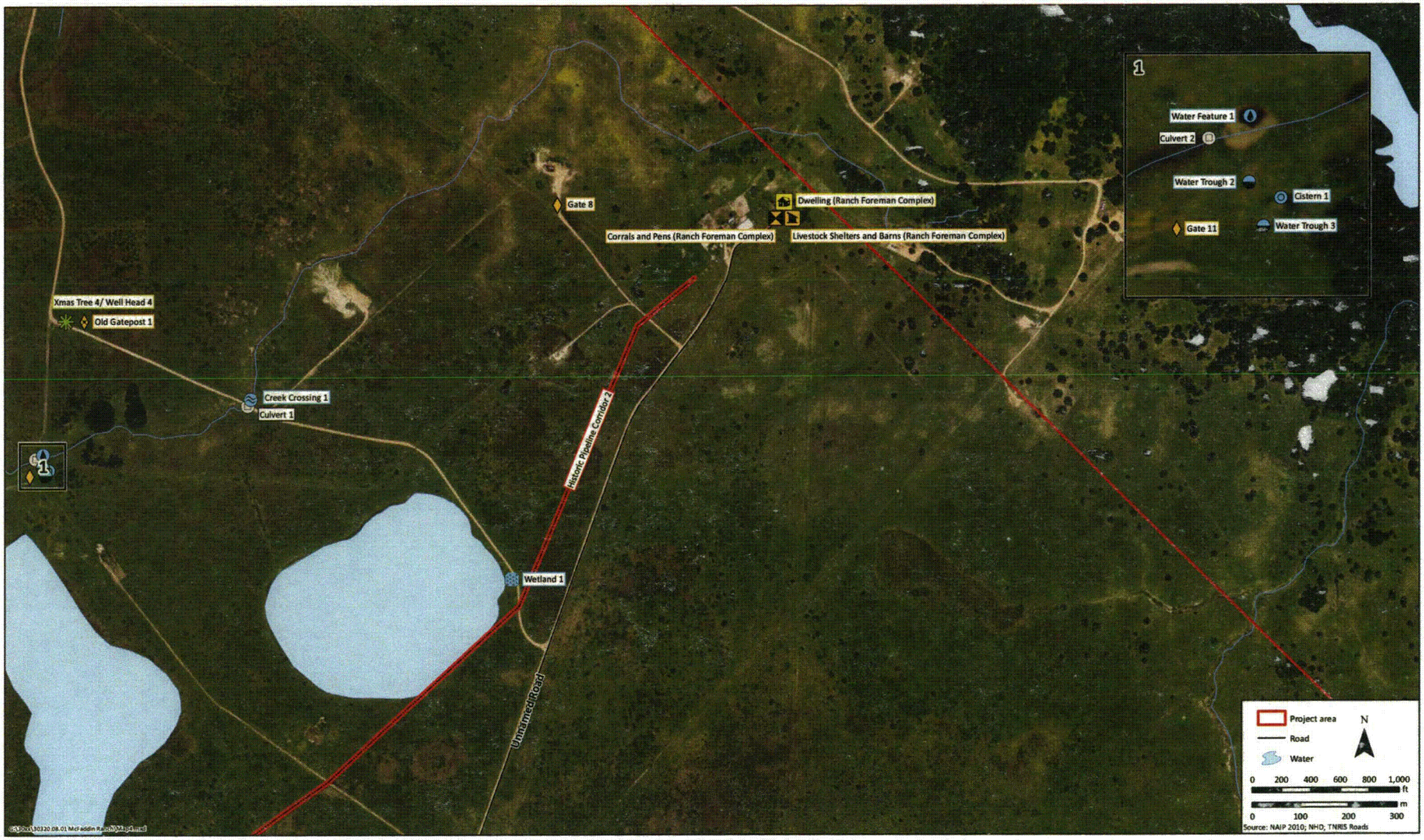


Map 2


Xmas Tree 4/ Well Head 4
Relict Fence 1
US Hwy 77
Historic Pipeline Corridor 1
Dry Kay Creek
Unnamed road
Post and Wire Fence 1
Livestock Shelter 1
1
Windmill 2
Cistern 2
Water Feature 2
Historic Pipeline Corridor 1
2
Water Feature 1
Culvert 2
Water Trough 2
Cistern 1
Gate 11
Water Trough 3
Project area
Road
Water
N
0 200 400 600 800 1,000 ft
0 100 200 300 m
Source: NAIP 2010; NHD; TNRIS Roads

Map 3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Water Feature 1
Culvert 2
Water Trough 2
Cistern 1
Gate 11
Water Trough 3
Gate 8
Dwelling (Ranch Foreman Complex)
Corrals and Pens (Ranch Foreman Complex)
Livestock Shelters and Barns (Ranch Foreman Complex)
Xmas Tree 4/ Well Head 4
Old Gatepost 1
Creek Crossing 1
Culvert 1
Historic Pipeline Corridor 2
Wetland 1
Unnamed Road
Project area
Road
Water
N
0 200 400 600 800 1,000 ft
0 100 200 300 m
Source: NAIP 2010; NHD; TNRIS Roads

Map 4


Unnamed Road
Dry Kuy Creek
US Hwy 77
Wabuford Rd
Wind Break 6
Relict Fence 2
Water Trough 16
Water Trough 17
Cistern 10
Wind Break 7
Historic Pipeline Corridor 1
Project area
Road
Water
N
0 200 400 600 800 1,000 ft
0 100 200 300 m
Source: NAIP 2010; NHD; TNRIS Roads

Map 5

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Map 6


Linn Lake
Cistern 9
Water Trough 15
Water Feature 19
Project area
Water
N
0 200 400 600 800 1,000 ft
0 100 200 300 m
Source: NAIP 2010; NHD

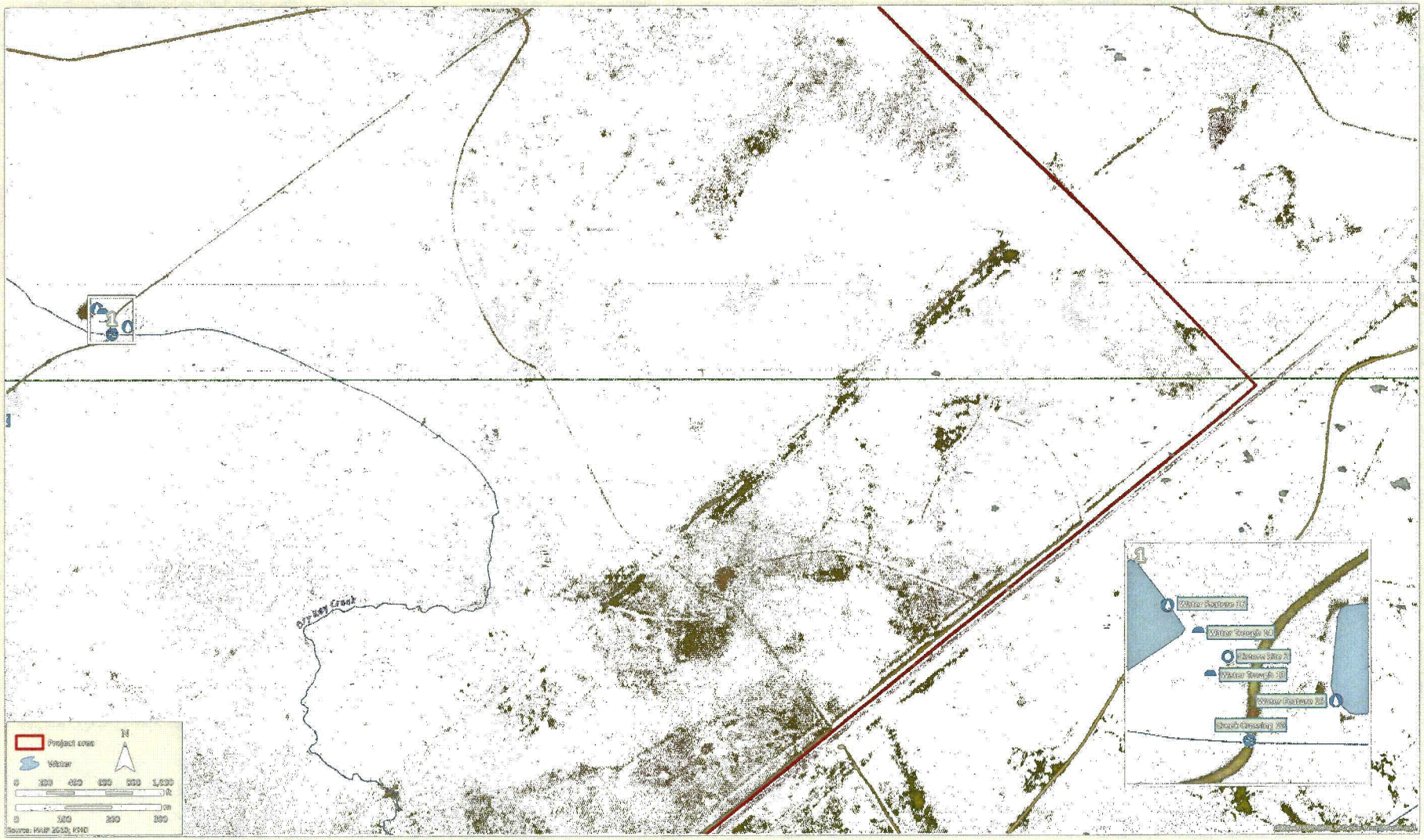
Map 7


Wind Break 8
Unnamed Road
Historic Pipeline Corridor 2
US Hwy 77
Well 1
Abandoned Well 1
Water Feature 6
Water Feature 7
Cistern 4
Cistern 5
Water Trough 6
Wind Break 1
1
Project area
Road
Water
N
0 200 400 600 800 1,000 ft
0 100 200 300 m
Source: NAIP 2010; NHD; TNRIS Roads
Kuy Creek
Kuy Creek

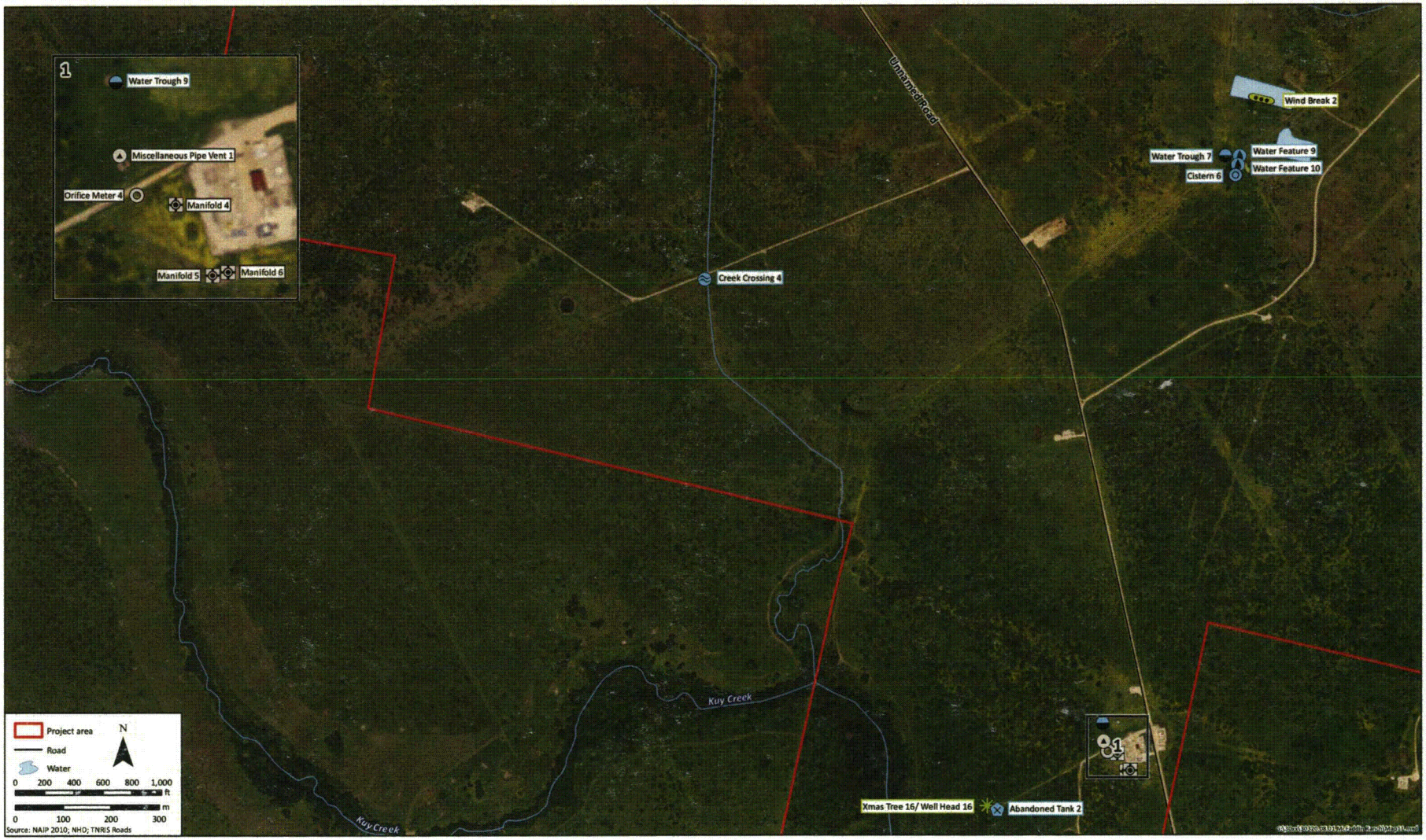
Map 8


Unnamed Road
Dry Kuy Creek
Creek Crossing 11
Water Feature 18
Abandoned Well 2
Creek Crossing 9
Water Trough 12
Barbed Wire Fence 15
Wind Break 4
Water Trough 11
Cistern 8
Wind Break 5
Creek Crossing 8
1
Road
Water
N
0 200 400 600 800 1,000 ft
0 100 200 300 m
Source: NAIP 2010; NHD; TNRIS Roads

Map 9


Dry Key Creek
Project area
Water
N
0 200 400 600 800 1,000 ft
0 100 200 300 m
Source: NAIP 2010, KHO
Water Source 10
Water Trough 10
Stream Site 2
Water Trough 11
Water Source 11
Creek Crossing 10

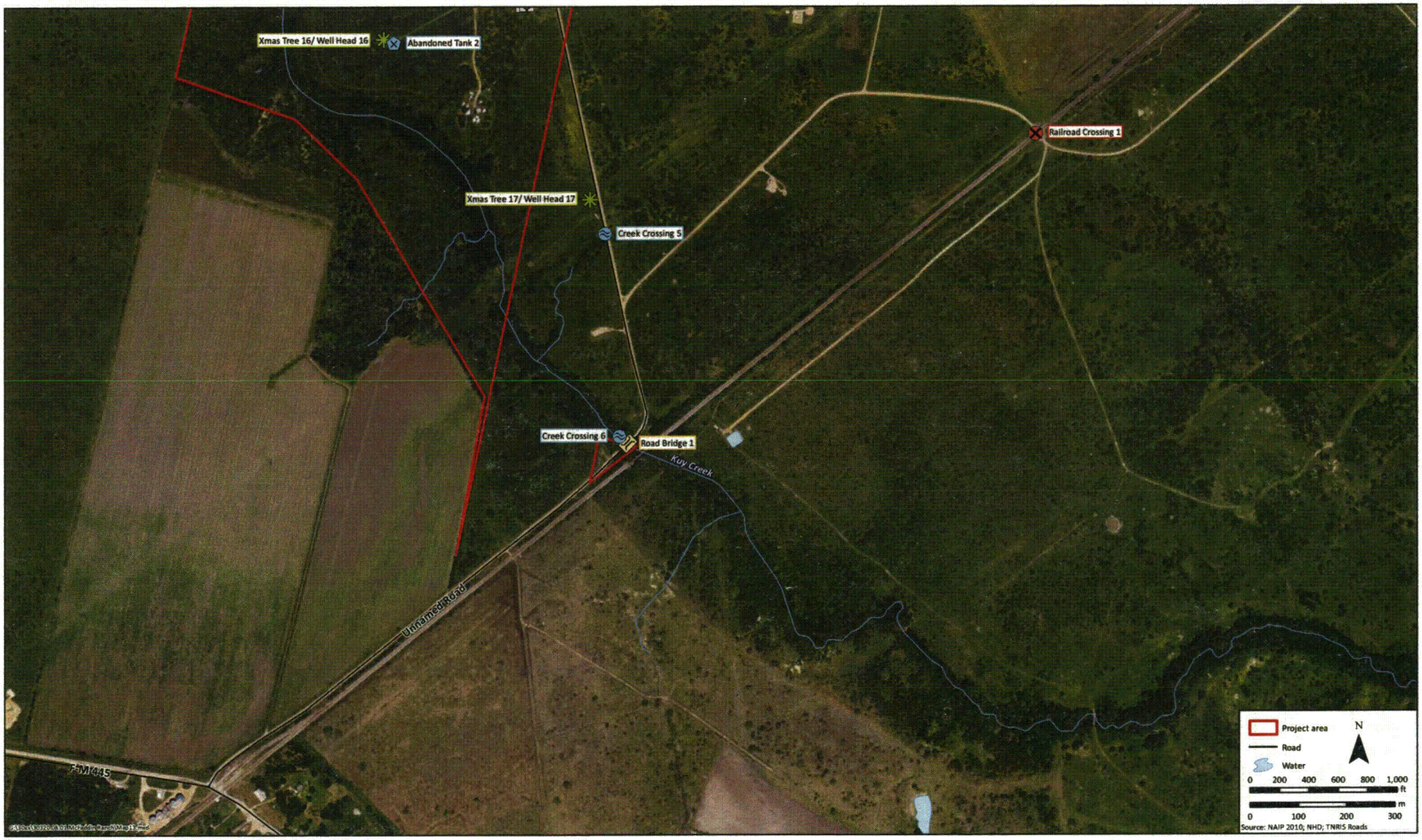
Map 10


1
Water Trough 9
Miscellaneous Pipe Vent 1
Orifice Meter 4
Manifold 4
Manifold 5
Manifold 6
Creek Crossing 4
Unnamed road
Wind Break 2
Water Trough 7
Water Feature 9
Water Feature 10
Cistern 6
Kuy Creek
Kuy Creek
Xmas Tree 16/ Well Head 16
Abandoned Tank 2
Project area
Road
Water
N
0 200 400 600 800 1,000 ft
0 100 200 300 m
Source: NAIP 2010; NHD; TNRIS Roads

Map 11


Creek Crossing 8
Wind Break 2
Chatom Site 1
Creek Crossing 7
Dry Bay Creek
Water Trough 10
Water Feature 11
Chatom 7
Project area
Water
N
0 200 400 600 800 1,000
ft
m
0 100 200 300
Source: NAIP 2010; MHD

Map 12


Xmas Tree 16/ Well Head 16
Abandoned Tank 2
Railroad Crossing 1
Xmas Tree 17/ Well Head 17
Creek Crossing 5
Creek Crossing 6
Road Bridge 1
Kuy Creek
Urias medRoad
FM 445
Project area
Road
Water
N
0 200 400 600 800 1,000 ft
0 100 200 300 m
Source: NAIP 2010; NHD; TNRIS Roads

Map 13

CR-4 (eRAI No.6429):

NRC Request:

CR-4 ESRP Sections 4.1.3 and 5.1.3 state that the State Historic Preservation Officer and any affected Native American Tribes be given the opportunity to comment on the effects from the proposed project on historic properties. Additionally, the National Historic Preservation Act of 1966, as amended (36 CFR 800) requires that Federal agencies consult with the appropriate State Historic Preservation Office (SHPO) and all Native American Tribes that have an interest in the region concerning the consideration of historic properties. Exelon and their contractors have been in correspondence with the THC concerning the identification of historic properties in the Area of Potential Effect. A timeline of the correspondence will ensure that the NRC is aware of all interactions between the SHPO and Exelon. Provide a copy of the timeline of correspondence between Exelon and the THC concerning the project.

Response:

A timeline of correspondence between Exelon and the THC concerning the VCS site is provided in Table 1.

Associated ESPA Revisions:

There are no ER changes associated with this response.

Table 1. Timeline of Exelon - Texas Historical Commission (THC) Correspondence for the VCS Site

Updated January 3, 2012

December 17, 2007	Meeting at SHPO's office re: cultural survey level of effort
April 11, 2008	NP-08-0002, letter to SHPO transmitting Phase Ia report
April 17, 2008	Meeting at SHPO's office re: Phase Ia results and Phase Ib APE and methodology
May 8, 2008	Letter from SHPO to Exelon concurring with Phase Ia report's methodology and findings, and proposed Phase Ib APE and methodology
May 13, 2008	NP-08-0006, letter to SHPO formally notifying of the addition of the Victoria County Site to the Section 106 consultation and asking for concurrence on Phase Ib APE and methodology (the same as described in the Phase Ia report)
May 29, 2008	Concurrence from SHPO on Phase Ib APE and methodology (concurrence stamp on last page of Exelon NP-08-0006 letter)
February 13, 2009	NP-09-0002, letter to SHPO transmitting the Phase Ib report for Section 106 review
April 1, 2009	NP-09-0005, letter to SHPO transmitting additional copies of Phase Ib report for Section 106 review
April 30, 2009	Letter from SHPO with comments on Phase Ib report and request for additional information. Transmitted to the NRC via NP-10-0013
October 15, 2009	Telephone call with SHPO's office notifying them of change from COL to ESP, and max building height from 166 ft to 230 ft
March 8, 2010	NP-10-0003, letter to SHPO transmitting revised Phase Ib report for Section 106 review
April 6, 2010	Letter from SHPO concurring with Phase Ib report findings, evaluations of eligibility, and assessment of project effects Transmitted to the NRC via NP-10-0013

TR 3.8-1 (eRAI No.6430):

NRC Request:

TR 3.8-1 ESRP 3.8 directs the staff to evaluate the applicant's conformance with 10 CFR 51.52(a). The estimated number of radiological shipments to and from the facility must be evaluated per 10 CFR 51.52 requirements. The number of assemblies is needed for this calculation. The following lists the information by reactor type that remains to be provided:

- AP1000 - number of unirradiated fuel assemblies per truck and number of fuel assemblies for reload and metric tons of uranium in the core and in an assembly
- ESBWR- number of unirradiated fuel assemblies per truck and number of fuel assemblies for reload;
- ABWR -number of unirradiated fuel assemblies per truck and number of fuel assemblies for reload;
- APWR - number of unirradiated fuel assemblies per truck.

Provide estimates of, with supporting documentation on, the total number of fuel assemblies in the reactor core, the number of assemblies replaced during a refueling outage, and the number of unirradiated fuel assemblies per truck shipment for the APWR, AP1000, ABWR, and ESBWR reactor types.

Response:

Table 1 provides the requested information.

References:

DTE Energy 2011. Detroit Edison Fermi 3 Combined License Application, Part 3: Environmental Report, Revision 2, February 2011.
Available at: http://pbadupws.nrc.gov/docs/ML1106/ML110600498.html

FPL 2011. Florida Power &Light Company, Turkey Point Plant, Units 6 & 7 COL Application, Part 3 - Environmental Report, Revision 3, December 2011.
Available at: http://pbadupws.nrc.gov/docs/ML1136/ML11362A171.html.

INEEL 2003. Early Site Permit Environmental Report Sections and Supporting Documentation, Prepared by Idaho National Engineering and Environmental Laboratory (INEEL), Engineering Design File 3747, May 15, 2003.

Luminant 2011. Comanche Peak Nuclear Power Plant Units 3 and 4 COL Application, Part 3, Environmental Report, Revision 2, August 2011. Available at: http://pbadupws.nrc.gov/docs/ML1118/ML11186A383.html

NINA (Nuclear Innovation North America) 2011. South Texas Project Units 3&4 COLA, Environmental Report, Rev. 5, Release date March 1, 2011. Available at: Available at: http://pbadupws.nrc.gov/docs/ML1103/ML110340962.html

Westinghouse 2003. AP1000 Siting Guide: Site Information for an Early Site Permit, APP-0000-X1-001, Revision 3, April 24, 2003

Associated ESPA Revisions:

There are no ER changes associated with this response.

Table 1. Unirradiated Fuel Transportation Analysis Parameters (Sheet 1 of 2)

Reactor Type	Value	Basis
AP1000		
Number of unirradiated fuel assemblies per truck	7 initial core; 9 reloads	Westinghouse estimates 7 fuel assemblies per shipment for the initial core (includes core components in containers with fuel assemblies) and 9 fuel assemblies per shipment for reloads. Values are consistent with recent AP1000 transportation analyses in the Turkey Point Units 6 and 7 COLA (See ER Section 5.7.2.1.11 in FPL 2011).
Number of fuel assemblies per reload	64	Westinghouse estimates the reload batch would be approximately 64 fuel assemblies for an 18-month refuel cycle.
Metric tons of uranium in core	84.5	Westinghouse estimates an initial core of 84.5 MTU in Section 3.5.1.2 of the AP1000 Siting Guide (Westinghouse 2003)
Metric tons of uranium per fuel assembly	0.5383	Westinghouse estimates an 0.5383 MTU per fuel assembly in Section 3.5.1.4 of the AP1000 Siting Guide (Westinghouse 2003)
ESBWR		
Number of unirradiated fuel assemblies per truck	28	GE-Hitachi Nuclear Energy estimates a maximum of 28 fuel assemblies per shipment. Value is similar to previous NRC transportation analyses. For example, the Fermi 3 COLA (see ER Table 3.8-3 in DTE Energy 2011) transportation analysis assumes 30 assemblies per shipment. The ESBWR Reactor Vendor Questionnaire in INEEL (2003) indicates 28 to 30 assemblies per shipment.
Number of fuel assemblies per reload	472	GE-Hitachi Nuclear Energy estimates the reload batch would be approximately 432-472 fuel assemblies (38 to 42 percent of the core) for a 24-month refuel cycle. Exelon transportation analysis assumed 472 fuel assemblies.

Table 1. Unirradiated Fuel Transportation Analysis Parameters (Sheet 2 of 2)

Reactor Type	Value	Basis
ABWR		
Number of unirradiated fuel assemblies per truck	28	Exelon estimates 28 fuel assemblies per shipment. This value is consistent with the ABWR transportation analysis in the South Texas Project Units 3 & 4 COLA (ER Section 5.11.1.11, NINA 2011). The ABWR Reactor Vendor Questionnaire in INEEL (2003) indicates 28 to 30 assemblies per shipment.
Number of fuel assemblies per reload	260	Exelon estimates the reload batch would be approximately 260 fuel assemblies for an 18-month refuel cycle. The annualized refueling expressed as MTU (30.15 MTU) is similar to the value of 32.76 MTU provided in the ABWR Reactor Vendor Questionnaire in INEEL (2003).
APWR		
Number of unirradiated fuel assemblies per truck	12	Mitsubishi estimates a maximum of 12 fuel assemblies per shipment. Value is consistent with the analysis for the APWR in the Comanche Peak COLA ER (Table 3.8-1 in Luminant 2011).

TR 3.8-2 (eRAI No.6430):

NRC Request:

TR 3.8-2 ESRP 3.8 directs the staff to evaluate the applicant's conformance with 10 CFR 51.52(a). The estimated number of radiological shipments to and from the facility must be evaluated per 10 CFR 51.52 requirements. The calculation involves normalization of the candidate reactor electrical output with that of the reference reactor for comparison. The following lists the information by reactor type that remains to be provided: AP1000 - Capacity factor and APWR - Capacity factor. Provide estimates of, with supporting documentation on, the gross electrical output (MWe) and capacity factors for the APWR, AP1000, ABWR, and ESBWR reactor types.

Response:

As noted in ER Section 5.7.2.1, net electrical output was used to provide conservatism in the estimates of normalized transportation impacts for comparison with the reference reactor and Table S-4. Table 1 provides the net electrical output and capacity factor for each reactor technology.

References:

GE-Hitachi Nuclear Energy 2007. ESBWR Design Control Document, Tier 2, Revision 4, September 2007.

GE Nuclear Energy 1997. ABWR Design Control Document, Tier 2, Revision 4, March 1997.

INEEL 2003. Early Site Permit Environmental Report Sections and Supporting Documentation, Prepared by Idaho National Engineering and Environmental Laboratory (INEEL), Engineering Design File 3747, May 15, 2003.

Luminant 2011. Comanche Peak Nuclear Power Plant Units 3 and 4 COL Application, Part 3, Environmental Report, Revision 2, August 2011. Available at: http://pbadupws.nrc.gov/docs/ML1118/ML11186A383.html

MHI (Mitsubishi Heavy Industries, LTD) 2008. Design Control Document for the US-APWR, Revision 1, August 2008.

NINA (Nuclear Innovation North America) 2011. South Texas Project Units 3&4 COLA, Environmental Report, Rev. 5, Release date March 1, 2011. Available at: Available at: http://pbadupws.nrc.gov/docs/ML1103/ML110340962.html

NRC 2006. Environmental Impact Statement for an Early Site Permit (ESP) at the North Anna ESP Site, NUREG-1811, November 2006. Available at: http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1811/sr1811v1.pdf.

NRC 2011a. Final Supplemental Environmental Impact Statement for Combined Licenses (COLs) for Vogtle Electric Generating Plant Units 3 and 4, NUREG-1947, March 2011. Available at: http://pbadupws.nrc.gov/docs/ML1107/ML11076A010.pdf.

NRC 2011b. Environmental Impact Statement for Combined Licenses (COLs) for South Texas Project Electric Generating Station Units 3 and 4, NUREG-1937, February 2011. Available at: http://pbadupws.nrc.gov/docs/ML1104/ML11049A000.pdf.

NRC 2011c. Final Environmental Impact Statement for Combined Licenses (COLs) for Comanche Peak Nuclear Power Plant Units 3 and 4, NUREG-1943, May 2011. Available at: http://pbadupws.nrc.gov/docs/ML1113/ML11131A001.pdf

Westinghouse 2003. AP1000 Siting Guide: Site Information for an Early Site Permit, APP-0000-X1-001, Revision 3, April 24, 2003

Associated ESPA Revisions:

There are no ER changes associated with this response.

Table 1. Unirradiated Fuel Transportation Analysis Parameters

Reactor Type	Value	Basis
AP1000		
Net electrical output (MWe)	1117	Westinghouse estimates an electrical output of 1117 MW(e). This value is consistent with the range of 1117 to 1150 MW(e) identified in Item 3.5.1.1 of the AP1000 Siting Guide (Westinghouse 2003). An estimated net electrical output of 1117 MW(e) was also used in NRC's analysis of the AP1000 for the Vogtle Units 3 and 4 combined licenses (COLs) (See Section 3.2 in NRC 2011a).
Capacity factor	0.93	Westinghouse estimates a capacity factor of 0.93 in Item 28.9 of the AP1000 Siting Guide (Westinghouse 2003)
ESBWR		
Net electrical output (MWe)	1535	GE-Hitachi Nuclear Energy estimates a net electrical power output of approximately 1535 MW(e) in Section 1.1.2.7 of the ESBWR DCD (GE-Hitachi Nuclear Energy 2007).
Capacity factor	0.96	Exelon estimates an average plant capacity factor of 0.96 which was applied to the transportation analyses for the ESBWR. This value is similar to GE's input to the ESBWR Reactor Vendor Questionnaire (INEEL 2003) which estimated an average capacity factor of 0.95. It is consistent with previous NRC analyses of the ESBWR reactor technology such as the North Anna ESP EIS (see Table 6-4 in NRC 2006).
ABWR		
Net electrical output (MWe)	1300	GE Nuclear Energy estimates a net electrical power output of approximately 1300 MW(e) in Section 1.1.10 of the ABWR DCD (GE Nuclear Energy 1997).
Capacity factor	0.95	GE Nuclear Energy estimates an average capacity factor of 0.95 in the ABWR Reactor Vendor Questionnaire found in INEEL 2003. The South Texas Project Units 3 & 4 COLA (ER Table 5.11-2, NINA 2011) and NRC EIS (NRC 2011b) use an ABWR capacity factor of 0.95.
APWR		
Net electrical output (MWe)	1600	Mitsubishi estimates a net electrical power rating of approximately 1600 MW(e) in Section 1.1.4 of the US-APWR DCD (MHI 2008).
Capacity factor	0.963	Mitsubishi estimates an average capacity factor of 0.963. Similar values used for APWR analyses in Comanche Peak COLA ER (0.95 in Section 5.7.1 and 0.93 in Section 3.8.1 of Luminant 2011) and EIS (0.95 in Section 6.1 and 0.93 in Section 6.2 of NRC 2011c).

TR 3.8-3 (eRAI No.6430):

NRC Request:

TR 3.8-3 ESRP 3.8 directs the staff to evaluate the applicant's conformance with 10 CFR 51.52(a). The estimated number of radiological shipments, including LLRW, to and from the facility must be evaluated per 10 CFR 51.52 requirements. Provide an estimate with supporting documentation, of the anticipated annual low-level radioactive waste (LLRW) volumes for shipment from the ABWR reactor type.

Response:

Tables 1 and 2 identify the anticipated annual LLRW volumes for shipment for the ABWR. As described in the VCS ER, Section 5.7.2.1, Exelon conservatively assumes that it would not perform on-site volume reduction. Therefore, the volumes indicated are "as generated" estimates rather than "shipped" waste volumes (which include volume reduction), both of which are presented in the ABWR Design Control Document (DCD).

Table 1. Estimated Annual "Dry" Solid Waste

Dry Waste Source	Volume Generated (m^3/year)
Combustible waste	225
Compactible waste	38
Other waste	100

Source: ABWR DCD Table 11.4-2 (GE Nuclear Energy 1997)

Table 2. Estimated Annual Waste Volume from "Wet" Solid Waste Sources

Wet Waste Source	Volume Generated (m^3/year)
CUW F/D Sludge[1]	4.7
FPC F/D Sludge[1]	1.8
Condensate Filter Sludge[1]	4.6
Condensate Demineralizer Resin[1]	18
LCW Filter Sludge[2]	0.6
HCW Filter Sludge[2]	3.8
LCW Demineralizer Resin[2]	1.8
HCW Demineralizer Resin[2]	1.8
HCW RO Rejects[2]	73

CUW F/D = Reactor Water Cleanup filter demineralizer
FPC F/D = Fuel Pool Cooling and Cleanup filter demineralizer
HCW = High Conductivity Waste
LCW = Low Conductivity Waste
RO = reverse osmosis

Sources:
1. ABWR DCD Table 11.4-1 (GE Nuclear Energy 1997)
2. South Texas Project Units 3 & 4 COLA (ER Table 3.5-11, NINA 2011).

References:

GE Nuclear Energy 1997. ABWR Design Control Document, Tier 2, Rev 4, March 1997. Available at: http://www.nrc.gov/reactors/new-reactors/design-cert/abwr.html#dcd

NINA (Nuclear Innovation North America) 2011. South Texas Project Units 3&4 COLA, Environmental Report, Rev. 5, Release date March 1, 2011. Available at: http://pbadupws.nrc.gov/docs/ML1103/ML110340962.html

Associated ESPA Revisions:

There are no ER changes associated with this response.