PMVictoriaESPPEm Resource

From: Terry, Tomeka
Sent: Wednesday, April 11, 2012 11:29 AM
To: VictoriaESP Resource
Subject: FW: Courtesy Copy of Exelon Letter NP-12-0016 - Responses to ER Audit Information Needs
Attachments: NP-12-0016 - Responses to ER Audit Information Needs.pdf

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From: Joshua.Trembley@exeloncorp.com [mailto:Joshua.Trembley@exeloncorp.com]
Sent: Monday, April 09, 2012 5:53 PM
To: skamboj@anl.gov; Terry, Tomeka; avci@anl.gov; Doub, Peyton; wescott@anl.gov; vanlonkhuyzen@anl.gov
Subject: Courtesy Copy of Exelon Letter NP-12-0016 - Responses to ER Audit Information Needs

Hi Tomeka,

As previously discussed, please find attached a courtesy copy of Exelon letter NP-12-0016. The letter provides partial responses to ER audit information needs TE-4, NR-3, and NR-5.

The original letter was submitted this afternoon via the NRC EIE system. A hard carbon copy was also sent to ANL.

Please let me know if you have questions regarding the submittal.

Thank you and have a good afternoon,
JT

610-765-5345

Hearing Identifier: Victoria_ESP_Public
Email Number: 619

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Subject: FW: Courtesy Copy of Exelon Letter NP-12-0016 - Responses to ER Audit Information Needs
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From: Terry, Tomeka

Created By: Tomeka.Terry@nrc.gov

Recipients:
"VictoriaESP Resource" <VictoriaESP.Resource@nrc.gov>
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Exelon Generation

NP-12-0016
April 9, 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 – Responses to ER Audit Information Needs
Docket No. 52-042

References: (1) Exelon Nuclear Texas Holdings, LLC letter to USNRC, Application for Early Site Permit for Victoria County Station, dated March 25, 2010

Exelon Nuclear Texas Holdings, LLC (Exelon) submitted an application for an early site permit (ESP) in Reference 1 for the Victoria County Station (VCS) site. That submittal consisted of six parts as described in the referenced letter.

To facilitate the NRC's review of ESP application Part 3, Environmental Report (ER), Exelon is providing responses to the following information needs (INE) requests identified at the VCS ESP application (ESPA) NRC environmental audit:

- TE-4 (partial response to unresolved items)
- NR-3 (partial response to unresolved items)
- NR-5 (partial response to unresolved items)

Responses to the above-referenced INE requests comprise Attachments 1 – 3, respectively. Regulatory commitments are summarized in Attachment 4.

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 9th day of April, 2012.

Respectfully,

Marilyn C. Kray
Vice President, Nuclear Project Development

Attachments:

1. INE TE-4 Partial Response
2. INE NR-3 Partial Response
3. INE NR-5 Partial Response
4. Summary of Commitments

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

INE TE-4:

NRC Request:

Provide wildlife observations characterized by habitat type.

Response:

Tables 1 through 3 identify the type(s) of habitat in which wildlife were observed during surveys of the proposed Victoria County Station site. These tables were adapted from Tables 2.4-1 through 2.4-3 of the Environmental Report.

Table 1 (Sheet 1 of 5)
Avian Species Observed During Wildlife Surveys[a] of the Proposed VCS Site[b] in Victoria County, Texas: 2007–2008

Avian Group	Species	Habitat[c]	Abundance[d]				
			Oct 07	Mar 08	May 08	Jul 08	Oct 08
Wading Birds	Roseate spoonbill (*Ajaia ajaja*)	B, I	Uncom	Uncom	Uncom	Com	—
	Great egret (*Ardea alba*)	B, I, L	Com	Com	Uncom	Com	Uncom
	Great blue heron (*Ardea herodias*)	B, I, L	Com	Com	Uncom	Uncom	Uncom
	American bittern (*Botaurus lentiginosus*)[e]	I	—	—	—	—	—
	Cattle egret (*Bubulcus ibis*)	G, I	—	—	Com	Uncom	—
	Green heron (*Butorides virescens*)[e]	B	—	—	—	—	—
	Little blue heron (*Egretta caerulea*)	B, I	Uncom	Uncom	Uncom	Uncom	Uncom
	Snowy egret (*Egretta thula*)	I, L	Uncom	—	Uncom	—	—
	Tricolored heron (*Egretta tricolor*)	I, L	Uncom	—	Uncom	—	—
	White ibis (*Eudocimus albus*)	I, L	Com	Com	Com	Com	Uncom
	Least bittern (*Ixobrychus exilis*)[e]	I	—	—	—	—	—
	Wood stork (*Mycteria americana*)	B, L	—	—	—	Uncom	Com
	Yellow-crowned night-heron (*Nyctanassa violacea*)	I	—	Uncom	Uncom	—	—
	Black-crowned night-heron (*Nycticorax nyctocorax*)[e]	I	—	—	—	Uncom	—
	Whitefaced or glossy ibis (*Plegadis chihi or falcinellus*)	B, I	—	Com	—	Uncom	—
Shoredbirds	Spotted sandpiper (*Actits macularia*)[e]	I, L	—	—	—	—	—
	Western sandpiper (*Calidris mauri*)[e]	L	—	—	—	—	—
	Least sandpipier (*Calidris pusillus*)[e]	L	—	—	—	—	—
	Mountain plover (*Charafrius montanus*)	I	—	Uncom	—	—	—
	Killdeer (*Charadrius vocifeous*)	G, I	Com	Com	Uncom	—	Com
	Black-necked stilts (*Himantopus mexicanus*)[e]	I, L	—	—	—	—	—
	Short-billed dowitcher (*Limnodromus griseus*)[e]	L	—	—	—	—	—
	Long-billed dowitcher (*Limnodromus scolopaceus*)[e]	L	—	—	—	—	—
	Stilt sandpiper (*Micropalma himantopus*)[e]	L	—	—	—	—	—

Table 1 (Sheet 2 of 5)
Avian Species Observed During Wildlife Surveys[a] of the Proposed VCS Site[b] in Victoria County, Texas: 2007–2008 (continued)

Avian Group	Species	Habitat[c]	Abundance[d] Oct 07	Mar 08	May 08	Jul 08	Oct 08
Shoredbirds (cont.)	American avocet (*Recurviristra americana*)	L	Uncom	—	—	—	—
	Lesser yellowlegs (*Tringa flavipes*)[e]	I	—	—	—	—	—
	Greater yellowlegs (*Tringa melanocleuca*)	I, L	—	Uncom	—	—	Uncom
	Solitary sandpiper (*Tringa solitaria*)[e]	I	—	—	—	—	—
Other Waterbirds	Wood duck (*Aix sponsa*)[e]	B	—	—	—	—	—
	Northern shoveler (*Anas clypeata*)	I, L	—	Uncom	—	—	—
	Blue-winged teal (*Anas discors*)[e]	I, L	—	—	—	—	Uncom
	Mottled duck (*Anas fulvigula*)[e]	I	—	—	—	—	—
	Anhinga (*Anhinga anhinga*)	L	Com	Com	—	—	—
	Yellow rail (*Coturnicops novaboracensis*)[e]	I	—	—	—	—	—
	Black-bellied whistling duck (*Dendrocygna autumnalis*)	I	—	—	Uncom	Uncom	—
	Fulvous whistling duck (*Dendrocygna bicolor*)	I	Uncom	—	—	—	—
	White pelican (*Pelecanus erythrorhynchos*)	L	Com	Com	Uncom	—	—
	American coot (*Fulicia americana*)	I	—	Uncom	—	—	—
	Sora (*Porzana carolina*)[e]	I	—	—	—	—	—
	Cormorant spp. (*Phalacrocorax sp*)	B, L	Uncom	Uncom	—	—	—
Upland Game Birds	Northern bobwhite quail (*Colinus virginianus*)	G, F, M	Uncom	Uncom	Abun	Abun	Uncom
	Common ground dove (*Columbina passerina*)	G, M	—	—	Uncom	Uncom	Uncom
	Sandhill crane (*Grus canadensis*)	G	Com	Abun	—	—	—
	Wild turkey (*Meleagris gallapavo*)	B, F	Uncom	Uncom	Uncom	—	—
	Mourning dove (*Zenaida macroura*)	G, F, M, I	Com	Com	Abun	Com	Abun
Passerines & Other Birds	Red-winged blackbird (*Agelaius phoeniceus*)	B, G, I	—	Uncom	Com	Uncom	—
	Ruby-throated hummingbird (*Archilochus colubris*)	B	—	—	—	Uncom	—

Table 1 (Sheet 3 of 5)
Avian Species Observed During Wildlife Surveys[a] of the Proposed VCS Site[b] in Victoria County, Texas: 2007–2008 (continued)

Avian Group	Species	Habitat[c]	Abundance[d] Oct 07	Mar 08	May 08	Jul 08	Oct 08
Passerines & Other Birds (cont.)	Tufted titmouse (*Baeolophus bicolor*)	B, F, M	—	Uncom	Uncom	Uncom	Uncom
	Great horned owl (*Bubo virginiana*)[e]	B	—	—	—	—	—
	Northern cardinal (*Cardinalis cardinalis*)	G, B, F, M	Com	Com	Abun	Abun	Com
	Chimney swift (*Chaetura pelagica*)[e]	G	—	—	—	—	—
	Lark sparrow (*Chondestes grammacus*)[e]	G	—	—	—	—	—
	Yellow-billed cuckoo (*Coccyzus americanus*)	G, M	—	—	Uncom	Uncom	—
	Northern flicker (*Colaptes auratus*)	F	—	Uncom	—	—	—
	Eastern wood pewee (*Contopus virens*)	B	—	—	—	—	Uncom
	American crow (*Corvus brachyrhynchos*)	B, G, I	—	Uncom	Uncom	Uncom	Com
	Yellow-rumped warbler (*Dendroica coronata*)	B	—	Uncom	—	—	—
	Yellow-throated warbler (*Dendroica dominica*)[e]	M	—	—	—	—	—
	Palm warbler (*Dendroica palmarum*)	G, M	—	—	—	—	Uncom
	Pileated woodpecker (*Dryocopus pileatus*)	B, F	—	—	—	Uncom	—
	Gray catbird (*Dumetella caroleninsis*)	B	—	—	—	—	Uncom
	Blue grosbeak (*Guiraca caerulea*)	G	—	—	—	Uncom	—
	Barn swallow (*Hirundo rustica*)	G, M	Com	—	—	—	Abun
	Loggerhead shrike (*Lanius ludovicianus*)	G	Com	Com	—	Uncom	Com
	Red-bellied woodpecker (*Melanerpes carolinus*)	F, M	—	Uncom	Uncom	Uncom	Uncom
	Song sparrow (*Melospiza melodia*)	B, F	—	Com	—	—	—
	Mockingbird (*Mimus polyglottos*)	B, G, F, M, I	Com	Com	Abun	Com	Com
	Black-and-white warbler (*Mniotitla varia*)	B	—	—	—	Uncom	—
	Brown-headed cowbird (*Molothrus ater*)	G, F	—	Uncom	Com	Uncom	—
	Great crested flycatcher (*Myiarchus crinitus*)	G, M	—	—	Uncom	—	—

Table 1 (Sheet 4 of 5)
Avian Species Observed During Wildlife Surveys[a] of the Proposed VCS Site[b] in Victoria County, Texas: 2007–2008 (continued)

Avian Group	Species	Habitat[c]	Abundance[d]				
			Oct 07	Mar 08	May 08	Jul 08	Oct 08
Passerines & Other	Ladder-backed woodpecker (*Picoides scalaris*)	G, M	—	—	Uncom	—	Uncom
Birds (cont.)	Painted bunting (*Passerina ciris*)	G, F	—	—	Uncom	Uncom	—
	Indigo bunting (*Passerina cyanea*)[e]	F	—	—	—	—	—
	Savannah sparrow (*Passerculus sandwichensis*)	G	—	Com	—	—	Uncom
	Cliff swallow (*Petrochelidon pyrrhonata*)	G, M	—	—	Com	Abun	Com
	Vesper sparrow (*Pooecetes gramineus*)[e]	G	—	—	—	—	—
	Carolina chickadee (*Poecile carolinensis*)	B, F	—	Uncom	Uncom	Uncom	Uncom
	Blue-gray gnatcatcher (*Poliotila caerula*)	B, F	—	Uncom	—	—	Uncom
	Prothonotary warbler (*Prothonotaria citrea*)[e]	B	—	—	—	—	—
	Great-tailed grackle (*Quiscalus mexicanus*)	G	—	—	—	Uncom	—
	Common grackle (*Quiscalus quiscala*)	G	—	Uncom	—	—	—
	Eastern phoebe (*Sayornis phoebe*)	B, F	—	Com	—	—	—
	Eastern bluebird (*Siala sialis*)	G	—	Uncom	—	—	—
	Yellow-bellied sapsucker (*Sphyrapicus varius*)	M	—	—	—	—	Uncom
	Dickcissel (*Spiza americana*)	G	—	—	Uncom	—	—
	Field sparrow (*Spizella pusilla*)	G	—	Uncom	—	—	—
	Northern rough-winged swallow (*Stelgidopteryx serripannis*)	G	—	—	—	—	Uncom
	Barred owl (*Strix varia*)	B, F	—	Uncom	Uncom	Uncom	Uncom
	Eastern meadowlark (*Sturnella magna*)	G, M	Com	Com	Uncom	Abun	Uncom
	Tree swallow (*Tachycineta bicolor*)	G, F	Com	Uncom	—	—	—
	Bewick's wren (*Theyomanes bewickii*)	F	—	—	Uncom	—	—
	Scissor-tailed flycatcher (*Tyrannus forficatus*)	G, M	Uncom	—	Abun	Com	Com
	Eastern kingbird (*Tyrannus tyrannus*)[e]	G	—	—	—	—	—

Table 1 (Sheet 5 of 5)
Avian Species Observed During Wildlife Surveys[(a)] of the Proposed VCS Site[(b)] in Victoria County, Texas: 2007–2008 (continued)

			Abundance[(d)]				
Avian Group	**Species**	**Habitat[(c)]**	**Oct 07**	**Mar 08**	**May 08**	**Jul 08**	**Oct 08**
Passerines & Other	Orange-crowned warbler (*Vermivora celata*)	F	—	—	—	—	Uncom
Birds (cont.)	White-eyed vireo (*Vireo griseus*)	B, F	—	Com	Com	Com	—
	Red-eyed vireo (*Vireo olivaceus*)[(e)]	B	—	—	—	—	—
Birds of Prey/Soaring Birds	White-tailed hawk (*Buteo albicaudatus*)	G, F, M	Uncom	Uncom	Uncom	Uncom	Uncom
	Red-tailed hawk (*Buteo jamaicensis*)	G, F, M	Com	Com	Uncom	Uncom	Uncom
	Red-shouldered hawk (*Buteo lineatus*)	B, F	—	Uncom	Uncom	Uncom	Uncom
	Crested caracara (*Caracara plancus*)	G, M	Uncom	Com	Uncom	Uncom	Uncom
	Turkey vulture (*Cathartes aura*)	G, F, M	Com	Com	Com	Abun	Abun
	Northern harrier *Circus cyaneus*)	G	—	Uncom	—	—	—
	Black vulture (*Coragyps atratus*)	G, F, M	Uncom	Uncom	Uncom	Uncom	Uncom
	Merlin (*Falco columbarius*)	G	Uncom	—	—	—	—
	Kestrel (*Falco sparverius*)	G, M	Com	Com	—	—	Com
	Bald eagle (*Haliaeetus leucocephalus*)	B, L	Uncom	—	—	—	Uncom

(a) Survey periods were October 22–24, 2007; March 11–13, 2008, May 28–29, 2008, July 15–16, 2008, and October 7–8, 2008.
(b) The site includes the VCS site, Black Bayou, and Linn Lake.
(c) Habitats where species were observed: G = bluestem grassland, B = bottomland hardwood forest, F = live oak forest, M = live oak motte, I = depressional wetland/stock pond, L = Linn Lake.
(d) Estimated abundances (within expected habitats) were classified as Abun = Abundant; Com = Common; and Uncom = Uncommon/Rare. "—" indicate birds were not observed during the specified survey and thus relative abundance was not determined. Abundance classifications were intuitively based on species encounters within the project area.
(e) These species were not observed during the five seasonal surveys but were observed during other site visits/surveys.

Table 2 (Sheet 1 of 2)
Mammals of Potential Occurrence[a] at VCS and Abundance Estimates of Those Observed in the Spring Surveys of 2008

Common Name	Scientific Name	Habitat[b]	Observed/ Abundance[c]
Northern pygmy mouse	*Baiomys taylori*	G	O
Ringtail	*Bassariscus astutus*	—	—
Coyote	*Canis latrans*	B	U
American beaver	*Castor canadensis*	G, B	U
Hispid pocket mouse	*Chaetodipus hispidus*	—	—
Least shrew	*Cryptotis parva*	—	—
Nine-banded armadillo	*Dasypus novemcinctus*	F	C
Virginia opossum	*Didelphis virginiana*	F	C
Big brown bat	*Eptesicus fuscus*	—	—
Attwater's pocket gopher	*Geomys attwateri*	G	A
Southern flying squirrel	*Glaucomys volans*	—	—
Silver-haired bat	*Lasionycteris noctivagans*	—	—
Red bat	*Lasiurus borealis*	—	—
Hoary bat	*Lasiurus cinereus*	—	—
Northern yellow bat	*Lasiurus intermedius*	—	—
Seminole bat	*Lasiurus seminolus*	—	—
Black-tailed jackrabbit	*Lepus californicus*	—	—
Northern river otter	*Lontra canadensis*	—	—
Bobcat	*Lynx rufus*	B	O
Striped skunk	*Mephitis mephitis*	—	—
Long-tailed weasel	*Mustela frenata*	—	—
Cave Myotis	*Myotis velifer*	—	—
White-nosed coati	*Nasua narica*	—	—
Eastern woodrat	*Neotoma floridana*	—	—
Crawford's gray shrew	*Notiosorex crawfordi*	—	—
Evening bat	*Nycticeius humeralis*	—	—
Big free-tailed bat	*Nyctinomops macrotis*	—	—
White-tailed deer	*Odocoileus virginiana*	G, B, F, M, I	A
Northern grasshopper mouse	*Onychomys leucogaster*	—	—
Marsh rice rat	*Oryzomys palustris*	G, I	O
Collared peccary	*Pecari tajacu*	—	—
White-footed mouse	*Peromyscus leucopus*	G, F, M	O
Deer mouse	*Peromyscus maniculatus*	—	—
Eastern Perimyotis	*Pipistrellus subflavus*	—	—
Northern raccoon	*Procyon lotor*	B, F	A

Table 2 (Sheet 2 of 2)
Mammals of Potential Occurrence[(a)] at VCS and Abundance Estimates of Those Observed in the Spring Surveys of 2008

Common Name	Scientific Name	Habitat[(b)]	Observed/ Abundance[(c)]
Cougar	*Puma concolor*	—	—
Fulvous harvest mouse	*Reithrodontomys fulvescens*	G	U
Plains harvest mouse	*Reithrodontomys montanus*	—	—
Eastern mole	*Scalopus aquaticus*	—	—
Eastern gray squirrel	*Sciurus carolinensis*	B, F, M	O
Eastern fox squirrel	*Sciurus niger*	B, F	A
Hispid cotton rat	*Sigmodon hispidus*	G, I	A
Mexican ground squirrel	*Spermophilus mexicanus*	—	—
Thirteen-lined jackrabbit	*Spermophilus tridecemlineatus*	—	—
Eastern spotted skunk	*Spilogale putorius*	—	—
Feral hog	*Sus scrofa*	G, B, M, I	C
Swamp rabbit	*Sylvilagus aquaticus*	—	—
Eastern cottontail	*Sylvilagus floridanus*	G, F	C
Brazilian free-tailed bat	*Tadarida brasiliensis*	—	—
American badger	*Taxidea taxus*	—	—
Common gray fox	*Urocyon cinereoargenteus*	—	—
Red fox	*Vulpes vulpes*	—	—

(a) According to Schmidly (2004).
(b) General habitats where species were observed: G = bluestem grassland, B = bottomland hardwood forest, F = live oak forest, M = live oak motte, I = depressional wetland/stock pond.
(c) Abundance categories were intuitively based on species encounters within the project area and regional knowledge: A = abundant, C = common, U = uncommon, O = occasional, R = rare, — = not observed

Reference:

Schmidly (2004). Schmidly, D.J., *The Mammals of Texas, 6th Edition*, 2004.

Table 3 (Sheet 1 of 3)
Amphibians and Reptiles of Potential Occurrence[(a)] at VCS and Abundance Estimates of Those Observed in the Spring Surveys of 2008

Common Name	Scientific Name	Habitat[(b)]	Observed/ Abundance[(c)]
Frogs			
Blanchard's cricket frog	*Acris crepitans blanchardi*	B, I	C
Eastern green toad	*Bufo debilis*	—	—
Texas toad	*Bufo speciosus*	—	—
Gulf coast toad	*Bufo valliceps*	B, F, M, I	C
Woodhouse's toad	*Bufo woodhousii woodhousii*	—	—
Eastern narrowmouth toad	*Gastrophryne carolinensis*	F	O
Great plains narrowmouth toad	*Gastrophryne olivacea*	—	—
Cope's gray treefrog	*Hyla chrysoscelis*	—	—
Green treefrog	*Hyla cinerea*	F	C
Squirrel treefrog	*Hyla squirella*	F	O
Gray treefrog	*Hyla versicolor*	—	—
Spotted chorus frog	*Pseudacris clarkii*	—	—
Strecker's chorus frog	*Pseudacris streckeri*	—	—
Western chorus frog	*Pseudacris triseriata*	—	—
Bullfrog	*Rana catesbeiana*	I	C
Southern leopard frog	*Rana sphenocephala*	B, I	A
Hurter's spadefoot	*Scaphiopus hurterii*	—	—
Salamanders			
Smallmouth salamander	*Ambystoma texanum*	—	—
Eastern newt	*Notophthalmus viridescens*	—	—
Slimy salamander	*Plethodon glutinosus complex*	—	—
Southern redback salamander	*Plethodon serratus*	—	—
Western lesser siren	*Siren intermedia nettingi*	I	C
Crocodilians			
American alligator	*Alligator mississippiensis*	B, I	C
Lizards			
Green anole	*Anolis carolinensis*	—	—
Texas spotted whiptail	*Cnemidophorus gularis*	—	—
Marbled whiptail	*Cnemidophorus marmoratus*	—	—
Six-lined racerunner	*Cnemidophorus sexlineatus sexlineatus*	—	—
Five-lined skink	*Eumeces fasciatus*	B	C
Broadhead skink	*Eumeces laticeps*	—	—
Mediterranean gecko	*Hemidactlus turcicus turcicus*	—	—

Table 3 (Sheet 2 of 3)
Amphibians and Reptiles of Potential Occurrence[(a)] at VCS
and Abundance Estimates of Those Observed in the Spring Surveys of 2008

Common Name	Scientific Name	Habitat[(b)]	Observed/ Abundance[(c)]
Keeled Earless lizard	*Holbrookia propinqua propinqua*	—	—
Western slender glass lizard	*Ophisaurus attenuatus*	—	—
Texas horned lizard	*Phrynosoma cornutum*	—	—
Texas spiny lizard	*Sceloporus olivaceus*	—	—
Southern prairie skink	*Sceloporus septentrionalis obtusirostris*	—	—
Northern fence/Prairie lizard	*Sceloporus undulatus hyacinthinus*	—	—
Ground skink	*Scincella lateralis*	B, F	C
Snakes			
Broad-banded copperhead	*Agkistrodon contortrix laticinctus*	—	—
Western cottonmouth	*Agkistrodon piscivorus leucostoma*	I	U
Texas glossy snake	*Arizona elegans arenicola*	—	—
Eastern yellow-bellied racer	*Coluber constrictor flaviventris*	—	—
Western diamondback rattlesnake	*Crotalus atrox*	—	—
Canebrake rattlesnake	*Crotalus horridus atricaudatus*	—	—
Great plains rat snake	*Elaphe emoryi*	—	—
Southwestern rat snake	*Elaphe guttata meahllmorum*	—	—
Texas rat snake	*Elaphe obsoleta lindheimeri*	G	C
Mud snake	*Farancia abacura*	—	—
Eastern hognose snake	*Heterodon platirhinos*	—	—
Texas night snake	*Hypsiglena torquata jani*	—	—
Prairie king snake	*Lampropeltis calligaster calligaster*	I	O
Speckled king snake	*Lampropeltis getula splendida*	G	O
Louisiana milk snake	*Lampropeltis triangulum amaura*	—	—
Texas blind snake	*Leptotyphlops dulcis*	—	—
Eastern coachwhip	*Masticophis flagellum flagellum*	F, I	C
Texas coral snake	*Micrurus fulvius tenere*	—	—
Blotched water snake	*Nerodia erythrogaster transversa*	—	—
Broad-banded water snake	*Nerodia fasciata confluens*	B, I	C
Diamondback water snake	*Nerodia rhombifer rhombifer*	B, I	A
Rough green snake	*Opheodrys aestivus*	—	—
Bull snake	*Pituophis catenifer sayi*	—	—
Graham’s crayfish snake	*Regina grahamii*	—	—
Western massasauga	*Sistrurus catenatus tergeminus*	—	—
Western pygmy rattlesnake	*Sistrurus miliarius streckeri*	—	—

**Table 3 (Sheet 3 of 3)
Amphibians and Reptiles of Potential Occurrence[(a)] at VCS
and Abundance Estimates of Those Observed in the Spring Surveys of 2008**

Common Name	Scientific Name	General Habitat[(b)]	Observed/ Abundance[(c)]
Marsh brown snake	*Storeria dekayi limnetes*	—	—
Flathead snake	*Tantilla gracilis*	—	—
Plains black-headed snake	*Tantilla nigriceps nigriceps*	—	—
Checkered garter snake	*Thamnophis marcianus marcianus*	—	—
Gulf coast ribbon snake	*Thamnophis proximus orarius*	—	—
Eastern garter snake	*Thamnophis sirtalis sirtalis*	—	—
Texas lined snake	*Tropidoclonion lineatum texanum*	—	—
Ground snake	*Virginia striatula*	F	U
Rough earth snake	*Virginia striatula*	—	—
Turtles			
Spiny softshell	*Apalone spinifera*	I	U
Common snapping turtle	*Chelydra serpentina*	I	U
Texas tortoise	*Gopherus berlandieri*	—	—
Cagle's map turtle	*Graptemys caglei*	—	—
Yellow mud turtle	*Kinosternon flavescens*	—	—
Mississippi mud turtle	*Kinosternon subrubrum hoppocrepis*	—	—
Texas river cooter	*Pseudemys texana*	—	—
Common mush turtle	*Sternotherus odoratus*	—	—
Eastern box turtle	*Terrapene carolina*	—	—
Ornate box turtle	*Terrapene ornata*	—	—
Red-eared slider	*Trachemys scripta*	I	C

(a) According to Tennant (1984, 1985, 2006), and Dixon (2000).
(b) General habitats where species were observed: G = bluestem grassland, B = bottomland hardwood forest, F = live oak forest, M = live oak motte, I = depressional wetland/stock pond.
(c) Abundance categories were intuitively based on species encounters within the project area and regional knowledge: A = abundant, C = common, U = uncommon, O = occasional, R = rare, — = not observed.

<u>References</u>:

Dixon 2000. *Amphibians and Reptiles of Texas, 2nd Edition* Dixon, J.R., Texas A&M Press, College Station, 2000

Tennant 1984. *The Texas Snakes*, Tennant, A., 1984, Texas Monthly Press, Austin.

Tennant 1985. *A Field Guide to Texas Snakes,* Tennant, A., Gulf Publishing Company, Houston, 1985.

Tennant 2006. *Lone Star Field Guide: Texas Snakes,* Tennant, A., Taylor Trade Publishing, Boulder, 2006.

Associated ESPA Revisions:

ER Table 2.4-2 (Sheet 1 of 2) will be revised to modify the abundance category for the American beaver in a future ESP application revision:

Table 2.4-2 (Sheet 1 of 2)
Mammals of Potential Occurrence[(a)] at VCS and Abundance Estimates of Those Observed in the Spring Surveys of 2008

Common Name	Scientific Name	General Habitat[(b)]	Observed/ Abundance[(c)]
Northern pygmy mouse	*Baiomys taylori*	G	O
Ringtail	*Bassariscus astutus*	B, F, M	—
Coyote	*Canis latrans*	G, F	U
American beaver	*Castor canadensis*	I	—U
Hispid pocket mouse	*Chaetodipus hispidus*	G	—
Least shrew	*Cryptotis parva*	G, F	—
Nine-banded armadillo	*Dasypus novemcinctus*	G, F	C
Virginia opossum	*Didelphis virginiana*	G, B, F, I	C
Big brown bat	*Eptesicus fuscus*	G, B, F, I	—
Attwater's pocket gopher	*Geomys attwateri*	G	A
Southern flying squirrel	*Glaucomys volans*	B, F, M	—
Silver-haired bat	*Lasionycteris noctivagans*	G, B, F, I	—
Red bat	*Lasiurus borealis*	G, B, F, I	—
Hoary bat	*Lasiurus cinereus*	G, B, F, I	—
Northern yellow bat	*Lasiurus intermedius*	G, B, F, I	—
Seminole bat	*Lasiurus seminolus*	G, B, F, I	—
Black-tailed jackrabbit	*Lepus californicus*	G	—
Northern river otter	*Lontra canadensis*	G, B, F	—
Bobcat	*Lynx rufus*	G, F, M	O
Striped skunk	*Mephitis mephitis*	G, F	—
Long-tailed weasel	*Mustela frenata*	G, B, F	—
Cave Myotis	*Myotis velifer*	G, B, F, I	—
White-nosed coati	*Nasua narica*	B, F, M	—
Eastern woodrat	*Neotoma floridana*	G, F	—
Crawford's gray shrew	*Notiosorex crawfordi*	G	—
Evening bat	*Nycticeius humeralis*	G, B, F, I	—
Big free-tailed bat	*Nyctinomops macrotis*	G, I	—
White-tailed deer	*Odocoileus virginiana*	G, B, F, M	A
Northern grasshopper mouse	*Onychomys leucogaster*	G	—
Marsh rice rat	*Oryzomys palustris*	I	O
Collared peccary	*Pecari tajacu*	G, F	—
White-footed mouse	*Peromyscus leucopus*	G, F	O
Deer mouse	*Peromyscus maniculatus*	G, B, F, M	—
Eastern Perimyotis	*Pipistrellus subflavus*	G, B, F, I	—
Northern raccoon	*Procyon lotor*	B, F, I	A

INE NR-3:

NRC Request:

What are the causes and the health impacts of *Karenia brevis* (which causes red tide)?

Response:

As discussed in ER Subsection 5.3.4.1, the planktonic organism *Karenia brevis* causes red tide when present in high concentrations. These algae produce toxins (known as "brevotoxins") that affect the nervous system of fishes, often resulting in paralysis and death. Humans can be affected through the consumption of brevotoxins. For example, an ailment called neurotoxic shellfish poisoning (NSP), which can lead to serious illness, has been linked to consuming infected bivalve shellfish. Additionally, *Karenia brevis* can be broken apart by tidal action, currents, boats, or other agitating factors, leading to airborne toxins that can cause respiratory irritation. (FWC 2005)

Karenia brevis was mentioned in the first paragraph of ER Section 5.3.4.1 discussing, in general, the subject of etiological agents. Exelon did not intend to imply that a *Karenia brevis* bloom was a potential adverse impact from operation of Victoria County Station (VCS). This organism is found in oceanic, coastal, and estuarine waters of warm-temperate to subtropical regions.

In the copyrighted paper by Brown et al. (2006), it is stated that, in culture, the minimum salinities for growth were in the range 17.5 to 20 psu, but that higher values were needed for optimal conditions. Furthermore, the temperature range for the species is 59 to 86 degrees F (Magan and Villareal 2006; copyrighted).

Section 2.3 of the ER suggests that salinity in the Guadalupe River above the salt water barrier does not exceed 2 ppt (for our purposes ppt can be considered the same as psu). Discharges from VCS cannot appreciably affect the salinity in the river. Thermal discharges from the plant do not extend far beyond the discharge point as described in Section 5.3.2 of the ER. The area at the discharge point would not have sufficient salinity to support this organism. Therefore, there is no known mechanism by which VCS can affect *Karenia brevis*.

Furthermore, the Generic EIS for license renewal (NRC 1996) does not identify *Karenia brevis* as an environmental impact from nuclear plant operations, even for coastal or estuarine plants.

Given that *Karenia brevis* is not a plausible risk at the proposed VCS blowdown discharge location in the Guadalupe River, the specific reference to the organism will be removed from the first paragraph of ER Subsection 5.3.4.1 to avoid confusion.

References:

Alisa F. Maier Brown, Quay Dortch, Frances M. Van Dolah, Tod A. Leighfield, Wendy Morrison, Anne E. Thessen, Karen Steidinger, Bill Richardson, Cynthia A. Moncreiff, and Jonathan R. Pennock, "Effect of solinity on the distribution, growth, and toxicity of Karenia spp.", Harmful Algae 5 (2006) 1999-212. Available at http://mbl.academia.edu/AnneThessen/Papers/542487/Effect_of_salinity_on_the_distribution_growth_and_toxicity_of_Karenia_spp.

FWC (Florida Fish and Wildlife Commission) 2005. "Red Tide, Florida's Unwelcome Visitor." Page 3. Available at: http://research.myfwc.com/engine/download_redirection_process.asp?file=red_tide0605_3217.pdf&objid=-1629&dltype=product

Hugo A. Magan, Tracy A. Villareal, "The effect of environmental factors on the growth rate of Karenia brevis (Davis) G. Hansen and Moestrup," Harmful Algae 5 (2006) 192–198, available at http://www.fs.fed.us/rm/boise/AWAE/scientists/profiles/Magana/EffectsKbrevis.pdf

NRC (U.S. Nuclear Regulatory Commission) 1996. Generic Environmental Impact Statement for License Renewal of Nuclear Plants (GEIS), Volumes 1 and 2. NUREG-1437, Washington, DC. May.

<u>Associated ESPA Revisions</u>:

The fourth sentence of the first paragraph in ER Subsection 5.3.4.1 will be revised as follows in a future ESP application revision:

Consideration of the impacts of etiological agents such as microorganisms, parasites, and thermostable viruses on public health is important for facilities using cooling ponds, lakes, canals, or small rivers, because discharge into such water bodies may significantly increase the presence and numbers of microorganisms. Etiological agents associated with cooling ponds or towers and thermal discharges can have negative impacts on human health. Their presence and concentration can be increased by the addition of heat. These etiological agents include the enteric pathogens *Vibrio* spp., *Salmonella* spp., *Shigella* spp., and *Plesiomonas shigelloides*, as well as *Pseudomonas aeruginosa*, thermophilic fungi, noroviruses, and toxin-producing algae ~~such as *Karenia brevis*, which causes red tide when present in high concentrations~~. They also include the bacteria *Legionella* spp., which causes Legionnaires' disease, and free-living amebae of the genera *Naegleria*, *Acanthamoeba*, and *Cryptosporidium*. Exposure to these etiological agents—or, in some cases, the endotoxins or exotoxins they produce—can cause illness or death.

INE NR-5:

NRC Request:

For the alternative sites, there needs to be a discussion of the health impacts (e.g. from cooling water discharge) at the alternative sites from this project and cumulative from other activities.

Response:

Nonradiological human health impacts for the VCS site are discussed per the guidance in NUREG-1555 in the Environmental Report sections 4.4.1, physical impacts from construction; 5.3.4, cooling system impacts to members of the public; 5.6.3, transmission line impacts to members of the public; and 5.8.1, physical impacts from operations. Taken as a whole, these sections address impacts such as noise, air quality, occupational health, etiological agents, electric fields, traffic, and aesthetics.

Nonradiological human health impacts for the alternative sites are discussed in the following subsections:

9.3.3.1	Matagorda County Site
9.3.3.2	Buckeye Site
9.3.3.3	Alpha Site
9.3.3.4	Bravo Site

These subsections primarily address (among other issues) the nonradiological human health topics of air quality, noise, emissions, traffic, and aesthetics, to the extent that a surveillance-level evaluation can determine them. In this Information Need response, Exelon has provided additional discussion below on etiological agents, air quality, noise, and electric shock. The issue of occupational health would have little discernible differences among the sites, so the VCS discussion in the Environmental Report remains valid for the alternative sites. Exelon has concluded that the Section 9.3.3 discussion on aesthetics and traffic remains adequate.

Human Health Impacts of Cooling Water Discharge – Etiological Agents

Section 5.3.4.1 of the VCS ESP ER addresses the human health impacts from heated discharge to the Guadalupe River and concludes that impacts for VCS would be SMALL because the maximum discharge temperature is below optimal for thermophilic agents, the heated plume rapidly dissipates, and the discharge location is difficult to access and is not routinely used for recreation. Furthermore, the ER examined reports of *Naegleria fowleri* infections in Texas from 1997 to 2007 (11 cases). None of the cases occurred in the south and eastern sections of Texas. Regarding cumulative impacts, Exelon designed the VCS discharge plume to not overlap with another nearby plant's plume such that thermal mixing zone requirements would be met. Exelon would use the same care in the design of a discharge at an alternative site.

<u>Matagorda County Site</u>

The Matagorda County site would use cooling towers, withdrawing water from the Gulf Intracoastal Waterway and discharging heated effluent to Tres Palacios Bay. *Naegleria fowleri* is a freshwater species and would not be an issue for the Matagorda County site.

However, *Karenia brevis*, a planktonic organism that causes red tide when present in high concentrations, would potentially be of concern. These algae produce toxins (known as "brevotoxins") that affect the nervous system of fishes, often resulting in paralysis and death. Humans can be affected through the consumption of brevotoxins. For example, an ailment called Neurotoxic Shellfish Poisoning (NSP), which can lead to serious illness, has been linked to consuming infected bivalve shellfish. Additionally, *Karenia brevis* can be broken apart by tidal action, currents, boats, or other agitating factors, leading to airborne toxins that can cause respiratory irritation. (FWC 2005)

A copyrighted paper by Magana and Villareal (2006) evaluated *Karenia brevis* growth rates at various light, temperature, and salinity levels, concluding that "In general, the pattern for maximum growth rate was a gradual increase as salinity increased then a decrease in growth rate at the higher salinities." This pattern was observed at varying rates with temperature conditions ranging from 15 to 30 degrees Celsius (59 to 86 degrees Fahrenheit (F); Magana and Villareal 2006). Cooling tower blowdown could raise the temperature in the area of the discharge location. Additionally, the blowdown would contain salt concentrations higher than those in the intake water due to evaporative cooling losses and recirculation in the cooling tower system. Thus, depending on ambient bay temperature and salinity conditions, it is possible that blowdown from the Matagorda County site could contribute to conditions favorable for *Karenia brevis* blooms. Given the previously described concerns regarding NSP, such toxic algal blooms would likely affect the viability of harvesting oysters from oyster beds proximal to the discharge location. As recently as March 2012, Matagorda Bay was closed for commercial oyster harvests due to red tide. (TPWD undated)

Considering the potential severity of NSP, the Matagorda County site could possibly have a large impact on the harvest of oyster beds near the proposed discharge location. However, in accordance with Texas Administrative Code (TAC) Section 307.4(f)(3), the cooling system and discharge structure would be designed to limit the temperature rise to 4 degrees F in fall, winter, and spring, and 1.5 degrees F in summer beyond the permitted discharge mixing zone. Thus, the affected portion of the bay would likely be limited. Additionally, the specific location and design of the discharge structure would be selected to minimize potential impacts to commercially harvested oyster beds. If deemed necessary or beneficial by the applicable permitting authorities, a program could be implemented to monitor for algal blooms. Accordingly, impacts from cooling system discharges at the Matagorda County site would be expected to be SMALL.

<u>Buckeye Site</u>

The Buckeye site has the same cooling concept as VCS: an onsite closed-cycle cooling basin that would discharge blowdown to a small river. Exelon concludes that the Buckeye site would have the same order of magnitude thermal plume as VCS, and, therefore, the impacts would be SMALL. The Buckeye site is upstream of the OXEA Corporation Bay City Plant, the proposed White Stallion Energy Center, and the South Texas Project (STP), all of which have permitted outfalls to the Colorado River. However, the Buckeye thermal plume would be designed to not overlap with thermal plumes from other known discharges. Furthermore, the White Stallion Energy Center recently announced that its design has been changed to dry cooling towers (WSEC 2011), and STP rarely discharges from its main cooling reservoir (STP 2010). Thus, the cumulative impacts from Buckeye site cooling system discharges would be SMALL.

Alpha Site

As described in Section 9.3.3 of the ER, the Alpha site would use cooling towers that would blowdown to the proposed Brazos River Authority (BRA) Allen's Creek Reservoir. Because the reservoir could serve multiple purposes, it is possible that members of the public could be exposed to heated effluent and, thus, to etiological agents such as *Naegleria*.

NRC evaluated the potential for *Naegleria* infection at the Wolf Creek site (NUREG-1437, Supplement 32). Wolf Creek is a once-through site discharging to a lake for which the public has access for fishing. Discharge temperatures from Wolf Creek would be higher than those from a cooling-tower-based plant such as Alpha. NRC concluded that impacts are SMALL. There were no reports of Naegleria infections from the reservoir, and water analyses were not positive for *Naegleria*. Similar results were also found for the V.C. Summer station, a once-through unit with a public-access reservoir.

In accordance with TAC Section 307.4(f)(2), the Alpha site cooling system would be designed to limit the temperature rise to 3 degrees over the ambient reservoir temperature beyond the permitted discharge mixing zone. Thus, plant discharges would have a minimal impact on the risk of contacting etiological agents in the majority of the proposed Allens Creek Reservoir. Within the relatively small discharge mixing zone, temperatures could be significantly higher than ambient reservoir conditions, potentially increasing the risk of public exposure to waterborne pathogens. To combat this risk, it is likely that the plant and the BRA could implement engineering and administrative controls, such as limiting access to the immediate area of the discharge and posting "No Swimming or Boating" signs, respectively. Additionally, the BRA would likely continue its practice of providing periodic warnings and general information regarding the risk of waterborne diseases on its publicly available website (BRA undated).

Considering the NRC's previous findings in NUREG-1437, the limited area of the reservoir potentially affected by the plant thermal discharges, and the availability of engineering and administrative controls, Exelon concludes that the Alpha site would have SMALL impacts. There are no known plans for other heated discharges to the BRA reservoir that could be cumulative.

Bravo Site

The Bravo site is similar to the Alpha site in that that plant would use cooling towers with makeup from a water retention basin. The Bravo plant would discharge blowdown to the retention basin, which could discharge to Walnut Creek. There would be no public access to the retention basin. Furthermore, the proposed Walnut Creek discharge location is within the site boundary, making it off limits to members of the public. Given the use of cooling towers, the subsequent dilution of the thermal plume in the retention basin, and the inaccessibility of the retention basin and the proposed discharge location to members of the public, Exelon concludes that the Bravo site would have SMALL impacts. There are no known plants with current or planned discharges that could produce cumulative impacts.

Air Quality, Noise

All the alternative sites are in low population density areas, in accordance with the avoidance and suitability criteria that resulted in their selection. Furthermore, the plant systems envisioned for alternative sites analysis would be nearly the same, with the notable exception that the Buckeye site would not use cooling towers. This difference would be expected to further reduce the potential for air quality and noise impacts relative to the already SMALL potential impacts at the other alternative sites. Therefore, impacts such as air quality and noise are expected to be approximately the same. There are no known projects that would be expected to produce cumulative impacts to air quality and noise.

Electric Shock

The discussion of impacts to the public from transmission lines in Section 5.6.3 applies to the alternative sites, as well. Transmission lines from the alternative sites could follow existing corridors to minimize aesthetics and land use impacts. Cumulative, induced-current, electric shock could be increased or decreased, depending on how the electric fields sum (or subtract). Nevertheless, Exelon believes that locating lines in existing corridors yields the least impact, where practicable, as the transmission service provider would be expected to plan for VCS.

References

BRA undated. Brazos River Authority public website. Available at http://www.brazos.org/Waterborne-Illness.asp. Accessed March 29, 2012.

FWC 2005. Florida Fish and Wildlife Commission, “Red Tide, Florida’s Unwelcome Visitor.” Page 3, June 2005. Available at: http://research.myfwc.com/engine/download_redirection_process.asp?file=red_tide0605_3217.pdf&objid=-1629&dltype=product

Hugo A. Magana, Tracy A. Villareal, “The effect of environmental factors on the growth rate of Karenia brevis (Davis) G. Hansen and Moestrup,” Harmful Algae 5 (2006) 192–198, available at http://www.fs.fed.us/rm/boise/AWAE/scientists/profiles/Magana/EffectsKbrevis.pdf

STP 2010. South Texas Project, Applicant’s Environmental Report - Operating License Renewal Stage South Texas Project Units 1 & 2, Section 4.4. September 2010. Available at http://www.nrc.gov/reactors/operating/licensing/renewal/applications/south-texas-proj/south-texas-project-enviro.pdf. Accessed March 29, 2012.

TPWD undated. Texas Parks and Wildlife Department, Red Tide in Texas. Available at: http://www.tpwd.state.tx.us/landwater/water/environconcerns/hab/redtide/status.phtml Accessed March 29, 2012.

WSEC 2011. White Stallion Energy Center, “White Stallion Announces Technology Change,” October 6, 2011. Available at: http://www.whitestallionenergycenter.com/wp-content/uploads/2011/10/WSEC_dry_cooling.pdf. Accessed March 29, 2012.

<u>Associated ESPA Revisions:</u>

There are no ESPA revisions associated with this response.

ATTACHMENT 4

SUMMARY OF REGULATORY COMMITMENTS

(Exelon Letter to USNRC No. NP-12-0016, dated April 9, 2012)

The following table identifies commitments made in this document. (Any other actions discussed in the submittal represent intended or planned actions. They are described to the NRC for the NRC's information and are not regulatory commitments.)

COMMITMENT	COMMITTED DATE	COMMITMENT TYPE	
		ONE-TIME ACTION (Yes/No)	Programmatic (Yes/No)
ER Table 2.4-2 (Sheet 1 of 2) will be revised to modify the abundance category for the American beaver in a future ESP application revision. (INE TE-4 partial response)	March 31, 2013	Yes	No
The fourth sentence of the first paragraph in ER Subsection 5.3.4.1 will be revised in a future ESP application revision. (INE NR-3 partial response)	March 31, 2013	Yes	No