Tables

Table 3-6A. Mean Abundance of Macroinvertebrate Taxa Nearshore Cleveland, Ohio[a]

Taxa	Open Water Stations					
	80	81	82	89	93	96†
Turbellaria	63(76)	327(567)	44(61)	38(0)	57(50)	19(33)
Nematoda	157(193)	918(383)	830(245)	1,723(1,483)	2,415(197)	635(585)
Dero nivea	75(131)	0(0)	13(22)	19(33)	25(44)	0(0)
Aulodrilus pigueti	57(82)	327(157)	0(0)	164(251)	88(121)	176(157)
Aulodrilus pluriseta	0(0)	327(87)	0(0)	289(342)	264(309)	415(564)
unidentifiable immature tubificids						
with hair chaetae	50(22)	315(194)	176(87)	270(240)	277(265)	214(227)
without hair chaetae	509(286)	3,070(503)	2,365(659)	3,208(1,416)	2,478(892)	2,252(1,990)
*Limnodrilus cervix**	101(115)	0(0)	0(0)	0(0)	0(0)	0(0)
Limnodrilus cervix variant*	6(11)	0(0)	50(87)	0(0)	0(0)	0(0)
*Limnodrilus claparedianus**	31(39)	0(0)	101(174)	0(0)	0(0)	0(0)
*Limnodrilus hoffmeisteri**	484(399)	13(22)	63(79)	0(0)	0(0)	0(0)
Limnodrilus udekemianus	0(0)	25(22)	0(0)	0(0)	0(0)	0(0)
Quistadrilus multisetosus	25(44)	13(22)	226(151)	0(0)	75(131)	13(22)
Helobdella stagnalis	0(0)	57(38)	13(31)	75(38)	0(0)	25(29)
Chironomus anthracinus? Group	6(11)	1,409(289)	2,547(340)	2,629(1,879)	1,076(180)	296(258)
C. semireductus group	0(0)	107(22)	170(86)	145(29)	113(19)	44(61)
Cryptochironomus sp.	13(11)	0(0)	0(0)	6(11)	19(0)	19(19)
Procladius sp.	0(0)	522(160)	126(39)	220(29)	308(115)	899(789)
Gammarus fasciatus	6(11)	0(0)	0(0)	0(0)	6(11)	0(0)
Eurycercus lamellatus	0(0)	31(29)	88(47)	50(47)	94(38)	6(11)
Ilyocryptus sp.	38(38)	44(29)	6(11)	94(163)	333(104)	25(44)
Harpacticoida	19(33)	132(105)	69(104)	38(50)	31(39)	0(0)
Hydracarina	6(11)	0(0)	0(0)	6(11)	6(11)	0(0)
Musculium partumeium	0(0)	138(29)	13(11)	195(104)	164(61)	157(160)
Musculium transversum	0(0)	6(11)	57(98)	6(11)	0(0)	1,201(2,081)
Pisidium sp.	88(121)	4,856(382)	4,919(1,615)	3,359(322)	4,617(520)	1,327(2,299)
Valvata piscinalis	0(0)	13(22)	25(11)	38(19)	19(19)	6(11)
Valvata tricarinata	0(0)	25(44)	57(33)	377(94)	465(71)	63(58)

Table 3-6A. Mean Abundance of Macroinvertebrate Taxa Nearshore Cleveland, Ohio[a]

Taxa	Harbor Stations					
	84	85	86	87	90	91
Turbellaria	50(87)	598(284)	63(22)	6(11)	13(11)	25(22)
Nematoda	19(19)	88(22)	31(22)	13(22)	6(11)	31(29)
Dero nivea	0(0)	201(349)	50(87)	0(0)	0(0)	25(44)
Aulodrilus pigueti	0(0)	604(1,046)	0(0)	126(44)	101(87)	126(115)
Aulodrilus pluriseta	0(0)	4,831(1,208)	855(971)	264(136)	151(151)	226(151)
unidentifiable immature tubificids						
with hair chaetae	7,246(1,208)	11,674(4,284)	503(87)	692(208)	352(231)	478(305)
without hair chaetae	23,348(1,395)	14,291(7,646)	4,730(314)	5,472(1,569)	8,907(5,734)	1,962(200)
*Limnodrilus cervix**	4,428(3,039)	1,006(349)	654(610)	38(65)	151(261)	0(0)
Limnodrilus cervix variant*	2,013(2,514)	201(349)	352(380)	25(44)	101(174)	0(0)
*Limnodrilus claparedianus**	2,013(2,514)	201(349)	503(314)	101(174)	201(349)	0(0)
*Limnodrilus hoffmeisteri**	12,479(1,845)	6,844(1,941)	3,070(1,229)	692(728)	755(151)	25(44)
Limnodrilus udekemianus	403(697)	1,208(1,046)	252(314)	38(38)	352(231)	25(44)
Quistadrilus multisetosus	4,227(604)	6441 (2440)	151(261)	604(226)	2,969(1,683)	1,208(151)
Helobdella stagnalis	0(0)	6(11)	145(169)	0(0)	0(0)	50(11)
Chironomus anthracinus? Group	0(0)	0(0)	13(11)	0(0)	0(0)	252(76)
C. semireductus group	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Cryptochironomus sp.	0(0)	0(0)	6(11)	0(0)	0(0)	13(11)
Procladius sp.	0(0)	69(11)	0(0)	384(193)	428(93)	660(247)
Gammarus fasciatus	0(0)	6(11)	384(58)	25(22)	13(22)	258(366)
Eurycercus lamellatus	0(0)	0(0)	13(11)	0(0)	6(11)	13(11)
Ilyocryptus sp.	0(0)	522(560)	6(11)	69(22)	19(33)	13(11)
Harpacticoida	6(11)	0(0)	0(0)	13(22)	0(0)	6(11)
Hydracarina	0(0)	6(11)	0(0)	6(11)	13(22)	6(11)
Musculium partumeium	19(0)	233(115)	44(39)	164(58)	113(33)	201(22)
Musculium transversum	63(54)	579(295)	69(39)	63(11)	44(22)	195(58)
Pisidium sp.	403(307)	3441 (2,446)	1,422(303)	1,000(278)	654(225)	1,006(372)
Valvata piscinalis	19(19)	13(11)	6(11)	82(61)	31(39)	69(39)
Valvata tricarinata	0(0)	0(0)	6(11)	13(22)	0(0)	88(39)

a. Mean abundance in May 1989 of macroinvertebrate taxa found at 75% or more of the stations during the study. Less frequent taxa (*C. semireductus* group, *Cryptochironomus* sp.) are included for comparison. *Bythotrephes cedarstroemi* was collected at 100% of the stations in October 1988 but was not collected in May 1989. Values are individuals m-2 (1 S.D.); N = 3. (taken from Krieger and Ross 1993).
†: only two replicate samples
*: number includes indentifiable adults only

Table 3-6B. Macroinvertebrate Collection Data in the Vicinity of Project Icebreaker[a]

Bratenahl 1994		Southeast Corner of Cleveland Harbor 1994	
Turbellaria	1	Eunapius fragilis	
Plumatella sp.		Cordylophora lacustris	1
Erpobdella punctata punctata	1	*Turbellaria*	572
Gammarus fasciatus	1,104	*Nais communis or N. variabilis*	19
Cheumatopsyche sp.	1,445	*Nais simplex*	133
Ceratopsyche alternans	1,156	*Gammarus fasciatus*	1,744
Hydropsyche confusa	424	*Ceratopsyche alternans*	
Hydroptila sp.		*Hydroptila sp.*	791
Cricotopus (C.) sp.	217	*Orthotrichia sp.*	
Cricotopus (C.) bicinctus	434	*Limonia sp.*	
Cricotopus (C.) tremulus group	1,260	*Cricotopus (C.) sp.*	70
Cricotopus (C.) trifascia	304	*Cricotopus (C.) bicinctus*	1,120
Polypedilum(Uresipedilum) flavum	348	*Cricotopus (C.) tremulus group*	
Rheotanytarsus sp.	2,477	*Cricotopus (C.) trifascia*	70
Empididae	16	*Cricotopus (Isocladius) reversus grp*	14
Physella sp.		*Cricotopus (Isocladius) sylvestris grp*	14
Dreissena polymorpha (zebra mussel)	26,032	*Nanocladius (N.) distinctus*	56
		Parachironomus frequens	
		Rheotanytarsus sp.	112
		Physella sp.	184
		Ferrissia sp.	107
		Dreissena polymorpha (zebra mussel)	11,792
Number of Quantitative Taxa	14		16
Total Taxa	17		22
ICI:	20		18
# of Organisms:	35,219		16,799

a. Source: DLZ 2008
EPT: Ephemeroptera, Plecoptera, and Trichoptera
ICI: invertebrate community index

Table 3-6C. Bird Species Likely to be Found Feeding in Lake Erie Offshore of Cleveland[a]

Common Name	Scientific Name
Common merganser	*Mergus merganser*
Red-breasted merganser	*Mergus serrator*
Common loon	*Gavia immer*
Horned grebe	*Podiceps auritus*
Double-crested cormorant	*Phalacrocorax auritus*
Bonaparte's gull	*Chroicocephalus philadelphia*
Ring-billed gull	*Larus delawarensis*
Herring gull	*Larus argentatus*
Great black-backed gull	*Larus marinus*
Caspian tern	*Hydroprogne caspia*
Common tern (Endangered in Ohio)	*Sterna hirundo*

a. Source: Guarnaccia and Kerlinger 2008

Table 3-7A. National Ambient Air Quality Standards[a]

Criteria Pollutant	Standard Type	Averaging Time	Standard	Comment
Carbon Monoxide	Primary	8 Hour 1 Hour	9 ppm 35 ppm	Not to be exceeded more than once per year
Lead	Primary and Secondary	Rolling 3 month average	0.15 µg/m^3 [(b)]	Not to be exceeded
Nitrogen Dioxide	Primary	1 Hour	100 ppb	98th percentile, averaged over three years
	Primary and Secondary	Annual	53 ppb[c]	Annual mean
Ozone	Primary and Secondary	8 Hour	0.075 ppm[d]	Annual fourth-highest daily maximum 8-hour concentration averaged over 3 years
Particle Pollution				
$PM_{2.5}$	Primary	Annual	12 µg/m^3	Annual mean averaged over 3 years
	Secondary	Annual	15 µg/m^3	Annual mean averaged over 3 years
	Primary and Secondary	24 Hour	35 µg/m^3	98th percentile, averaged over three years
PM_{10}	Primary and Secondary	24 Hour	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide	Primary and Secondary	1 Hour	75 ppb[e]	99th percentile of 1-hour daily maximum
		3 Hour	0.5 ppm	Not to be exceeded more than once per year

a. Source: United States Environmental Protection Aagency Air and Radiation December 14, 2012
b. Final rule signed October 15, 2008. The 1978 lead standard remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, where the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 starndard are approved.
c. The official level of the annual NO_2 standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard.
d. Final rule signed March 12, 2008. The 1997 ozone standard and related implementation rules remain in place. In 1997, Environmental Protection Agency revoked the 1-hour standard ozone standard in all areas, although some areas have continued obligations under that standard ("ant-backsliding"). The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.
e. Final rule signed June 2, 2010. The 1971 annual and 24-hour SC_2 standards were revoked in that same rulemaking. However, these standards remain in effect until one year after an area is designated for the 2010 standard, except in areas designated nonattainment for the 1971 standards, where the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standard are approved.
PM_{10}: particle matter (10 microns or less)
$PM_{2.5}$: particle matter (2.5 microns or less)
ppb: parts per billion
ppm: parts per million
µg/m^3: micrograms per cubic meter

Table 3-7B. Emission Rates for Nonattainment Areas[a]

Criteria Pollutant	Emission Rate (tons/year)
Ozone (VOCs or NO_x)	
Serious nonattainment areas	50
Severe nonattainment areas	25
Extreme nonattainment areas	10
Other ozone nonattainment areas ouside an ozone transport region	100
Other ozone nonattainment areas inside an ozone transport region	
VOC	50
NO_x	100
Carbon Monoxide: All nonattainment areas	100
SO_2 or NO_2: All nonattainment areas	100
PM_{10}	
Moderate nonattainment areas	100
Serious nonattainment areas	70
$PM_{2.5}$	
Direct emissions	100
SO_2	100
NO_x (unless determined not to be significant precursors)	100
VOC or ammonia (if determined to be significant precursors)	100
Lead: All nonattainment areas	25

a. Source: 40 CFR Part 93.153 (b)(1)

CO: carbon monoxide

NO_2: nitrogen dioxide

NOx: oxides of nitrogen

PM_{10}: particle matter (10 microns or less)

$PM_{2.5}$: particle matter (2.5 microns or less)

SO_2: sulfur dioxide

VOC: volatile organic compound

Table 3-7C. Emission Rates for Maintenance Areas[a]

Criteria Pollutant	Emission Rate (tons/year)
Ozone	
NO_x, SO_2, or NO_2: All maintenance areas	100
VOCs: Maintenance areas inside an ozone transport region	50
VOCs: Maintenance areas outside an ozone transport region	100
CO: All maintenance areas	100
PM_{10}: All maintenance areas	100
$PM_{2.5}$	
Direct emissions	100
SO_2	100
NO_x (unless determined not to be a significant precursor)	100
VOC or ammonia (if determined to be significant precursors)	100
Lead: All nonattainment areas	25

a. Source: 40 CFR Part 93.153 (b)(2)
CO: carbon monoxide
NO_2: nitrogen dioxide
NOx: oxides of nitrogen
PM_{10}: particle matter (10 microns or less)
$PM_{2.5}$: particle matter (2.5 microns or less)
SO_2: sulfur dioxide
VOC: volatile organic compound

Table 3-7D. Summary of Applicability Analysis — Onshore Emissions

Analysis	VOCs	NOx	CO	PM_{10}	$PM_{2.5}$	SO_2
USEPA Status for Cuyahoga County	Nonattainment for 8-Hour Ozone	Nonattainment for 8-Hour Ozone	Maintenance	Maintenance	Nonattainment	Maintenance
Onshore Estimated Emissions (tons per year)						
Construction of Project Icebreaker	2.40	21.13	17.37	1.48	1.39	0.04
Operation of Project Icebreaker	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant
EPA *de minimis* Threshold (tons per year)	50	50	100	100	100	100
Estimated Onshore Construction Emissions above *de minimis* Threshold	No	No	No	No	No	No
Estimated Onshore Operational Emissions above *de minimis* Threshold	No	No	No	No	No	No

CO: carbon monoxide
EPA: Enviornmental Protection Agency
NOx: oxides of nitrogen
PM_{10}: particle matter (10 microns or less)
$PM_{2.5}$: particle matter (2.5 microns or less)
SO_2: sulfur dioxide
USEPA: United States Environmental Protection Agency
VOC: volatile organic compound

Table 3-7E. Summary of Offshore Emissions Estimates

Analysis	VOCs	NOx	CO	PM_{10}	$PM_{2.5}$	SO_2
USEPA Status for Cuyahoga County	Nonattainment for 8-Hour Ozone	Nonattainment for 8-Hour Ozone	Maintenance	Maintenance	Nonattainment	Maintenance
OffShore Estimated Emissions (tons per year) Construction and Operation of Project Icebreaker	7.26	187.10	16.31	9.80	9.53	0.13
2008 Emissions for Cuyahoga County[a]	25,500	29,000	280,000	1,200	950	10,000
Estimated Offshore Construction and Operation Emissions as a Percentage of 2008 Emissions for Cuyahoga County	0.03%	0.65%	0.007%	0.82%	1.0%	0.001%

a. Source: Air Quality Trends and Nonattainment Status for Northeast Ohio, 2011 Update, Northeast Ohio Areawide Coordinating Agency, May 201

CO: carbon monoxide

NOx: oxides of nitrogen

PM_{10}: particle matter (10 microns or less)

$PM_{2.5}$: particle matter (2.5 microns or less)

SO_2: sulfur dioxide

USEPA: United States Environmental Protection Agency

VOC: volatile organic compound

Table 4-2A. Summary of Potential Mitigation Measures

Issue	Potential Measures to Minimize/Mitigate Effects
Hydrology	
Turbulence, wave effects, and scour near turbine foundations	Orient turbine foundations perpendicular to the prevailing wind direction; use of a stone-filled friction wheel around the base of the turbine foundation
Water and Sediment Quality	
Turbidity and suspension of sediment during turbine construction	Monitor turbidity during construction activities; avoid construction activities during heavy storm events, if possible
Turbidity and suspension of sediment during cable installation	Monitor turbidity during cable installation; use of side shields attached to the hydroplow to contain suspended sediment; use of horizontal directional drilling to minimize disturbance to nearshore areas
Disruption of water quality parameters	Monitor water quality parameters during construction activities
Acoustic Environment	
Exposure to harmful noise and vibration levels during construction	Monitor underwater noise during construction activities; use of a "soft start" procedure (a low energy start to the operations or starting each pile with several light strikes) during pile driving for turbine construction to remove majority of fish from the construction area prior to start of activities
Interference with sensitive fish spawning periods during construction activities	Avoid fish spawning periods during spring; use of horizontal directional drilling to minimize disturbance to nearshore areas
Benthic Macroinvertebrates	
Displacement/dispersal of benthic organisms during turbine construction and cable installation	Minimize overall footprint with jet plowing; use of horizontal directional drilling to minimize disturbance to nearshore areas
Electromagnetic field and temperature	Use of shielded transmission cable (three-core); burial of the cable in the substrate
Fish	
Exposure to harmful noise and vibration levels during construction	Monitor underwater noise during construction activities; use of a "soft start" procedure (a low energy start to the operations or starting each pile with several light strikes) during pile driving for turbine construction to remove majority of fish from the construction area prior to start of activities
Interference with sensitive fish spawning periods during construction activities	Avoid fish spawning periods during spring; use of horizontal directional drilling to minimize disturbance to nearshore areas
Electromagnetic field and temperature	Use of shielded transmission cable (three-core); burial of the cable in the substrate

Table 4-2A. Summary of Potential Mitigation Measures

Issue	Potential Measures to Minimize/Mitigate Effects
Birds and Bats	
Interference with peak bird nesting activity periods (onshore) during nearshore cable installation activities	Avoid cable installation activities during spring (which will also protect the IBA); use of horizontal directional drilling to minimize disturbance to nearshore areas
"Attractiveness" of construction equipment to birds and bats	Minimize, to the extent possible, lighting of construction equipment at night to avoid attracting insects and thereby birds and bats
Risk of bird and bat collisions with turbine blades during operation	Adjust the pitch of the turbine blades (i.e., blade feathering) during specific time periods and/or weather conditions which are high risk for birds and bats
Risk of bat collisions with turbine blades during operation	Increase the cut-in speed of the turbines
"Attractiveness" of the turbines to birds and bats	Minimize, to the extent possible, lighting on the turbines and other infrastructures to avoid attracting insects and thereby birds and bats Install red, synchronously flashing lights on the nacelles, which are less attractive to birds and bats, while still FAA compliant Avoid white and/or very light color paint schemes for the turbines, which attracts insects thereby potentially attracting birds and bats to the turbines
Nacelles providing the opportunity for bats to roost	Design nacelles to be secured against entry by bats for roosting; if can not be designed to ensure this, then consider regularly checking nacelles for the presence of roosting bats
Lake Uses	
Use of the turbine area by recreational boaters and fisherman	Lock access door to tower to prevent unauthorized access; post warning signs, as necessary
Cultural Resources	
Potential viewshed impacts	Paint the turbines so that they blend with the environment; downshielded lights, if appropriate
Potential nearshore effects	Use of horizontal directional drilling to minimize disturbance to nearshore areas

FAA: Federal Aviation Administration
IBA: Important Bird Area

Table 4-2B. Source Levels of Underwater Wind Farm Related Noise[ab]

Source	Noise Level	Basis
Vessel and machinery	152 to 192 dB re 1 µPa @ 1 m	based on measurements of large vessels in deep water and small vessels in shallow water
Geophysical survey	215 to 260 dB re 1 µPa @ 1 m	measurements for airguns, often used in the offshore oil and gas industries
Pile driving	192 to 262 dB re 1 µPa @ 1 m	measurements from different localities worldwide, on average increase with increasing pile diameter
Drilling	145 to 192 dB re 1 µPa @ 1 m	deep water measurements of oil and gas facilities
Trenching	178 dB re 1 µPa @ 1 m	measurements at North Hoyle
Turbine noise	153 dB re 1 µPa @ 1 m	wind turbine capacity less than 1 MW

a. Source: Meißner and Sordyl 2006, and references therein.
b. Source level is defined as the effective level of sound at a nominal distance of one meter, expressed in dB re µPa @ 1 m.
dB: decibel
m: meter
µPa: micropascal
MW: megawatt

Table 5A. Summary of Agencies and Organizations Contacted

Organization	Person	Contact Date	Data Requested	Data Provided	Comments on Data
Case Western Reserve University	Gerald Matisoff	7/30/2013	Sediment chemistry data	N	Provided papers, but would not share data not yet published
Cleveland State University	Fasong Yuan	7/1/2013	Fish, benthic organisms, or sediment chemistry data	N	Work is all in western basin
Cuyahoga River Community Planning	Cathi Lehn	7/2/2013	Fish, plankton, benthic organisms, or water/sediment chemistry data	N	Provided other contacts
Defiance College	Doug Kane	7/1/2013	Fish, plankton, benthic organisms, or sediment chemistry data	N	Provided other contacts
Heidelberg University	Ken Krieger	6/27/2013	Benthic organism data used in papers	N	Offered analytical assistance
Kent State University	Mark Kershner	6/26/2013	Fish or benthic invertebrate data	N	Provided other contacts
ODNR	Heather Elmer	6/25/2013	Water quality data	N	None
ODNR	Kevin Kayle, Jeff Tyson	6/27/2013	GIS, fish, invertebrate, and water quality data	Y	Refined request in August 2013. GIS, fish and water quality data provided. Requested invertebrate data again on 10/14/13.
ODNR	Joseph Wells (Mark Jones)	6/26/2013	Sediments data from https://www.sciencebase.gov/catalog/item/4f4e479de4b07f02db491dd1	Y	Sediment data
Ohio EPA	Amy Jo Klei	7/30/2013	Fish, benthic organism, or water/sediment chemistry data	N	No response after provided with requested project map
Ohio EPA	Dennis Mishne	6/20/2013		Y	Fish data
Ohio State University	Eugene Baig	7/1/2013	Fish, benthic organism, or sediment chemistry data	N	Provided other contacts; offered to help
Ohio State University	David Culver	6/27/2013	Fish, benthic organism, or sediment chemistry data	N	Plankton data is collected by DOW Fairport Fisheries Research Station; Offered to help in any way
USACE	Christine Cardus	8/13/2013	Open Lake Disposal areas in the project vicinity	Y	None
USACE	Bob Remmers	7/2/2013	Breakwater design drawings	Y	FOIA request submitted 7/19
USACE	Bob Remmers	7/9/2013	CDF 12 design drawings	Y	FOIA request submitted 7/19
USCG	CDR Keith Ropella	9/10/2013	Waterways Assessments for Cleveland Harbor	Y	None

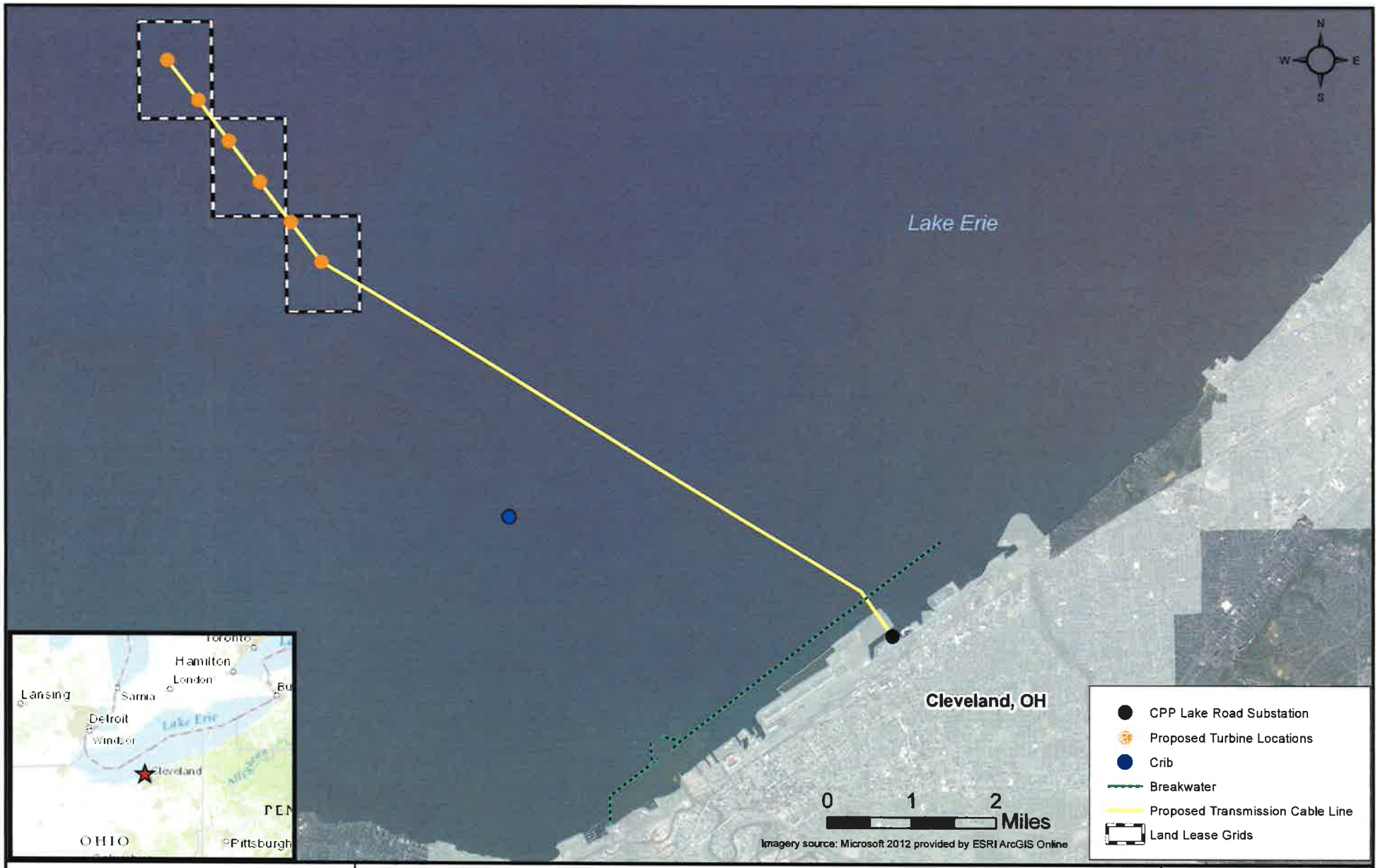
N: no
Y: yes
CDF: Confined Disposal Facility
DOW: Division of Wildlife
FOIA: Freedom of Information Act
GIS: geographic information system
ODNR: Ohio Department of Natural Resources
Ohio EPA: Ohio Environmental Protection Agency
USACE: United States Army Corps of Engineers
USCG: United States Coast Guard

Table 5B. Native American Tribes Identified for Consultation[a]

Tribe	Name	Position	Address
Delaware Nation, Oklahoma	Kerry Holton	President	P.O. Box 825 Anadarko, OK 73005
Forest County Potawatomi Community	Harold G. Frank	Chairperson	P.O. Box 340 Crandon, WI 54520
Hannahville Indian Community	Kenneth Meshiguad	Chairperson	N14911 Hannahville B1 Rd. Wilson, MI 49896-9728
Ottawa Tribe of Oklahoma	John Ballard	-	P.O. Box 110 811 Third Avenue NE Miami, OK 74355
Wyandotte Nation	Leaford Bearskin	Chief	P.O. Box 250 Wyandotte, OK 74370

a. Native Amercian tribes were identifed from the Native American Graves Protection and Repatriation Act (NAGPRA).

Figures

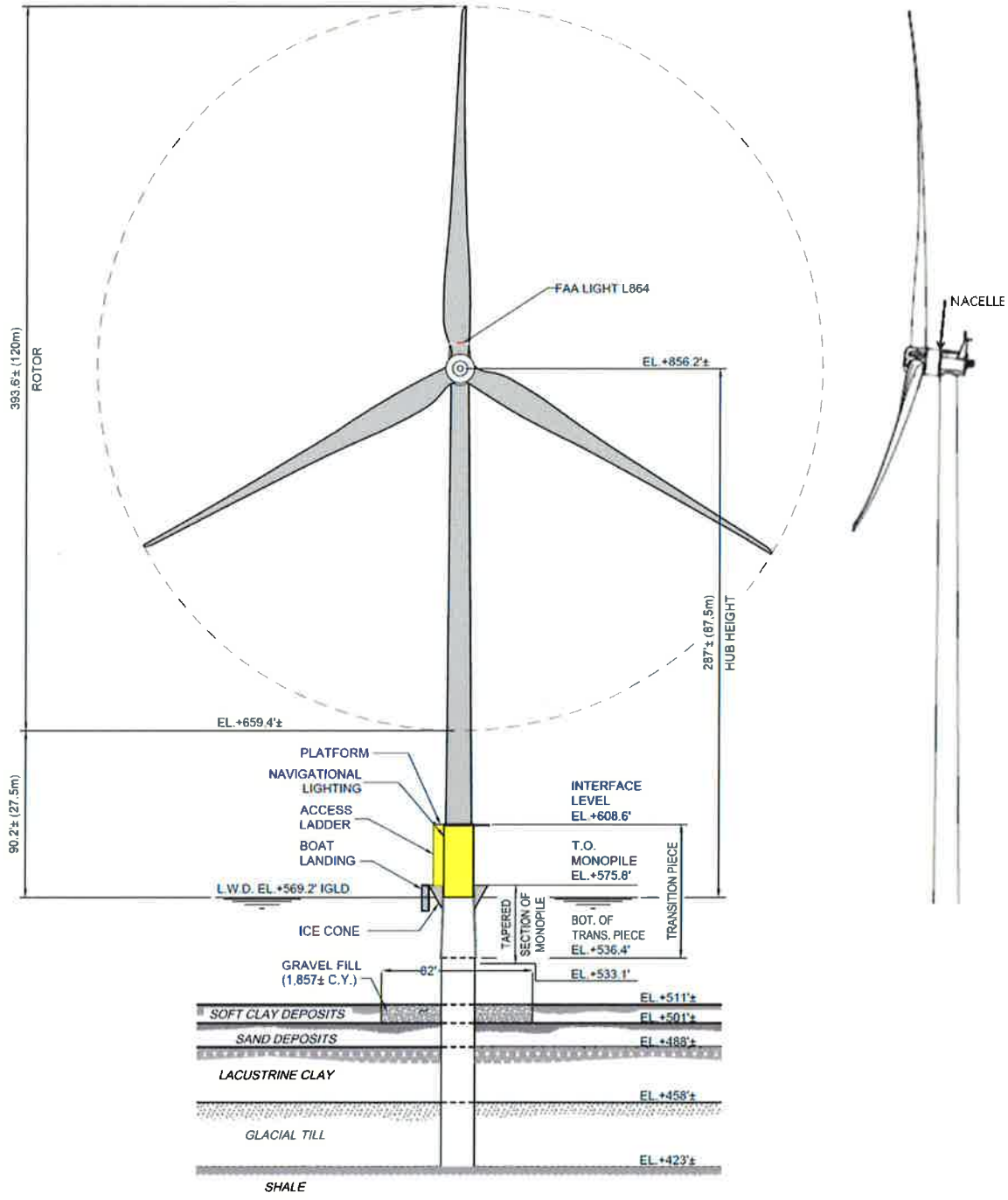


ENVIRON

Proposed Project Icebreaker Location

Figure 2-3A

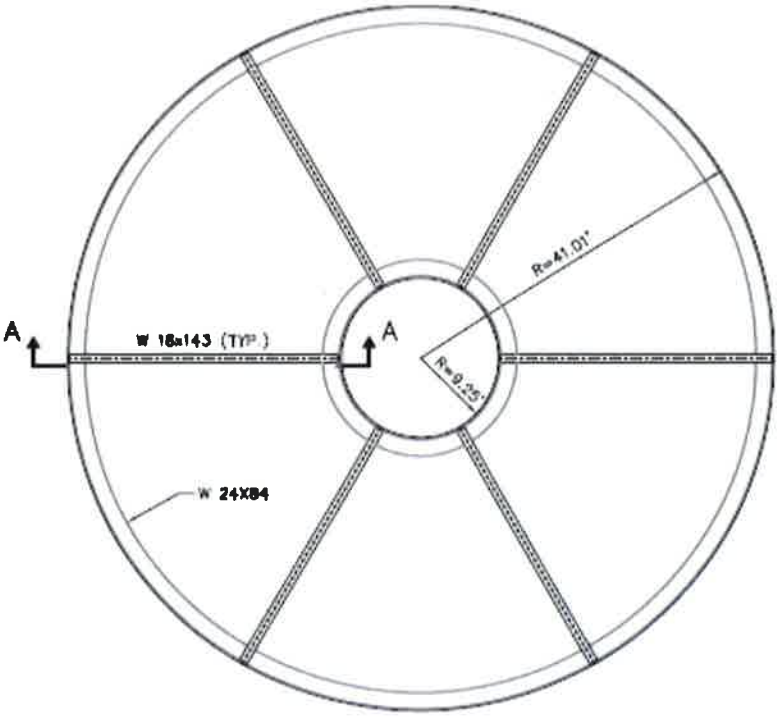
1/8/2014 M:\LeedCo\GIS\MXD\EA\Fig2-3A_CurrentProjectLocation.mxd



ENVIRON

Conceptual Design of Installed Wind Turbine

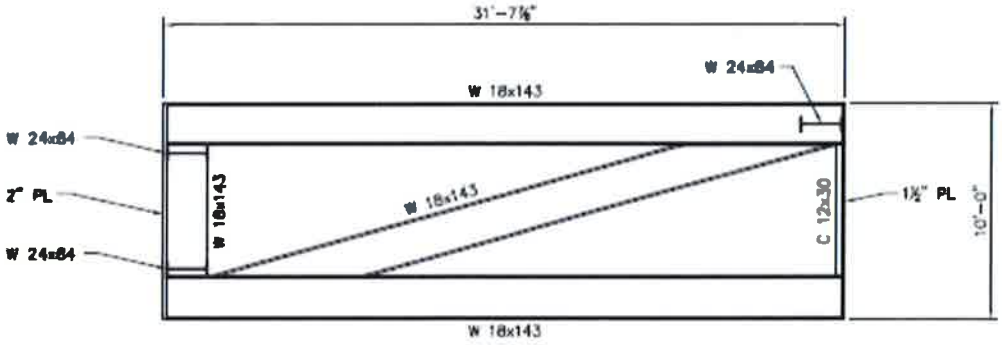
Figure 2-3B



82'ø FRICTION WHEEL
PLAN VIEW

0 20 40 FT.

SCALE 1"=20'-0"



SECTION A-A

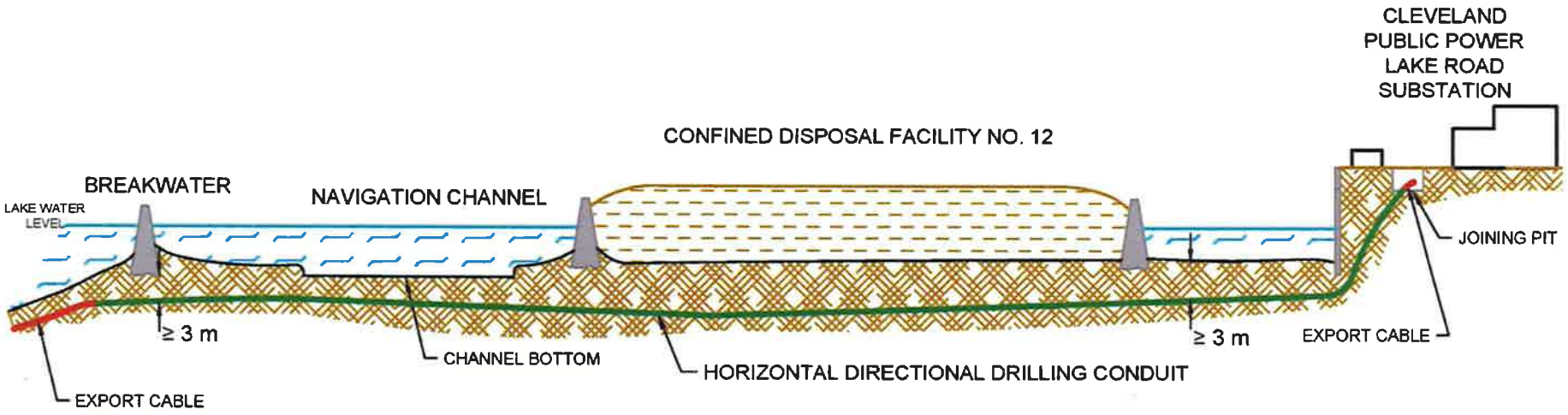
ENVIRON	Friction Wheel Detail	Figure 2-3C

ENVIRON

Proposed Transmission Cable Line to the Cleveland Public Power Lake Road Substation

Figure 2-3D

1/8/2014 M:\LeedCo\GIS\MXD\EA\Fig2-3D_TransmissionCable.mxd



(Note: not to scale; for illustration purposes only)

ENVIRON

Cross Section of Horizontal Directional Drilling

Project Icebreaker

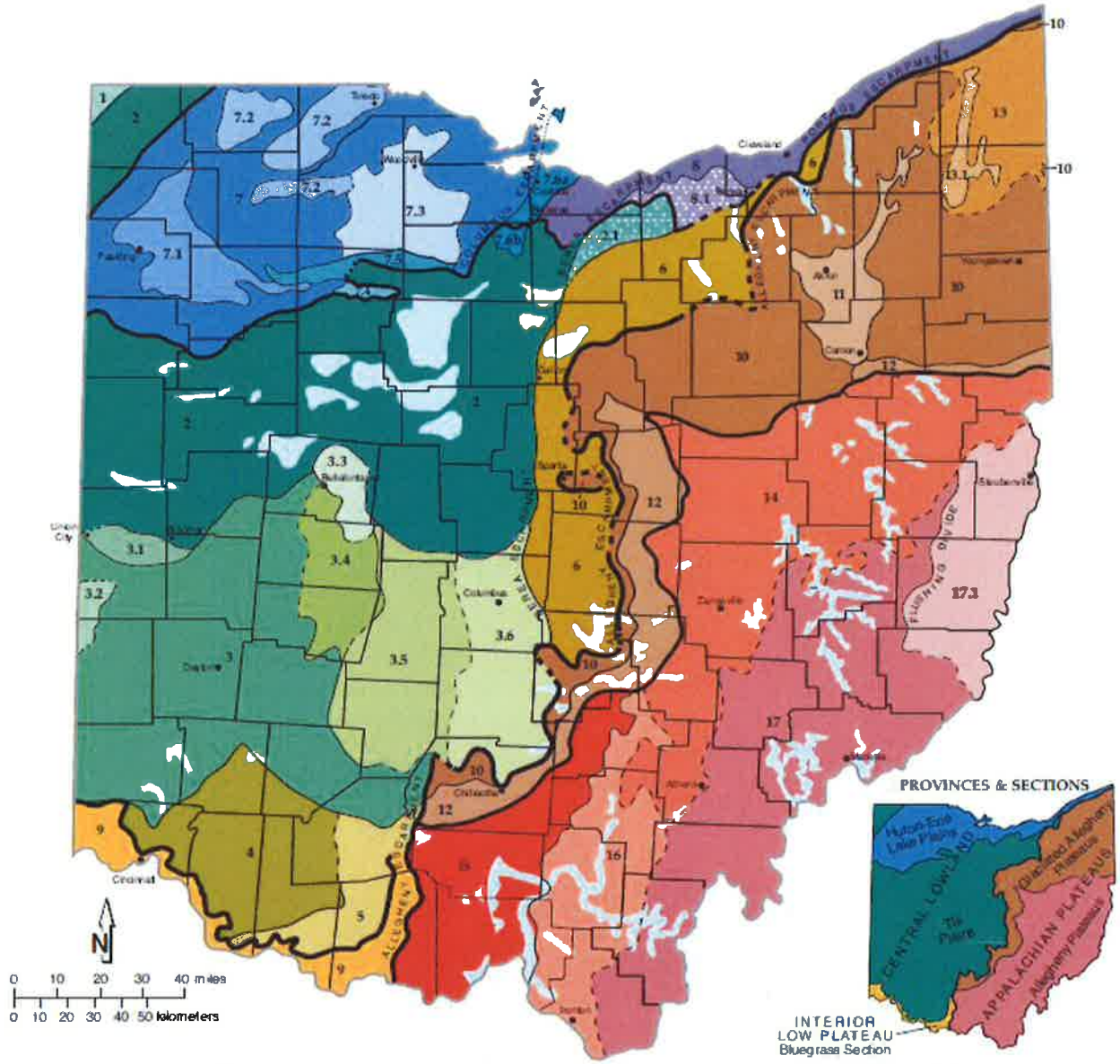
Figure
2-3E

ENVIRON

Ports in the Vicinity of Project Icebreaker

Figure
2-3F

1/8/2014 M:\LeedCo\GIS\MXD\EA\Fig2-3F_Ports.mxd

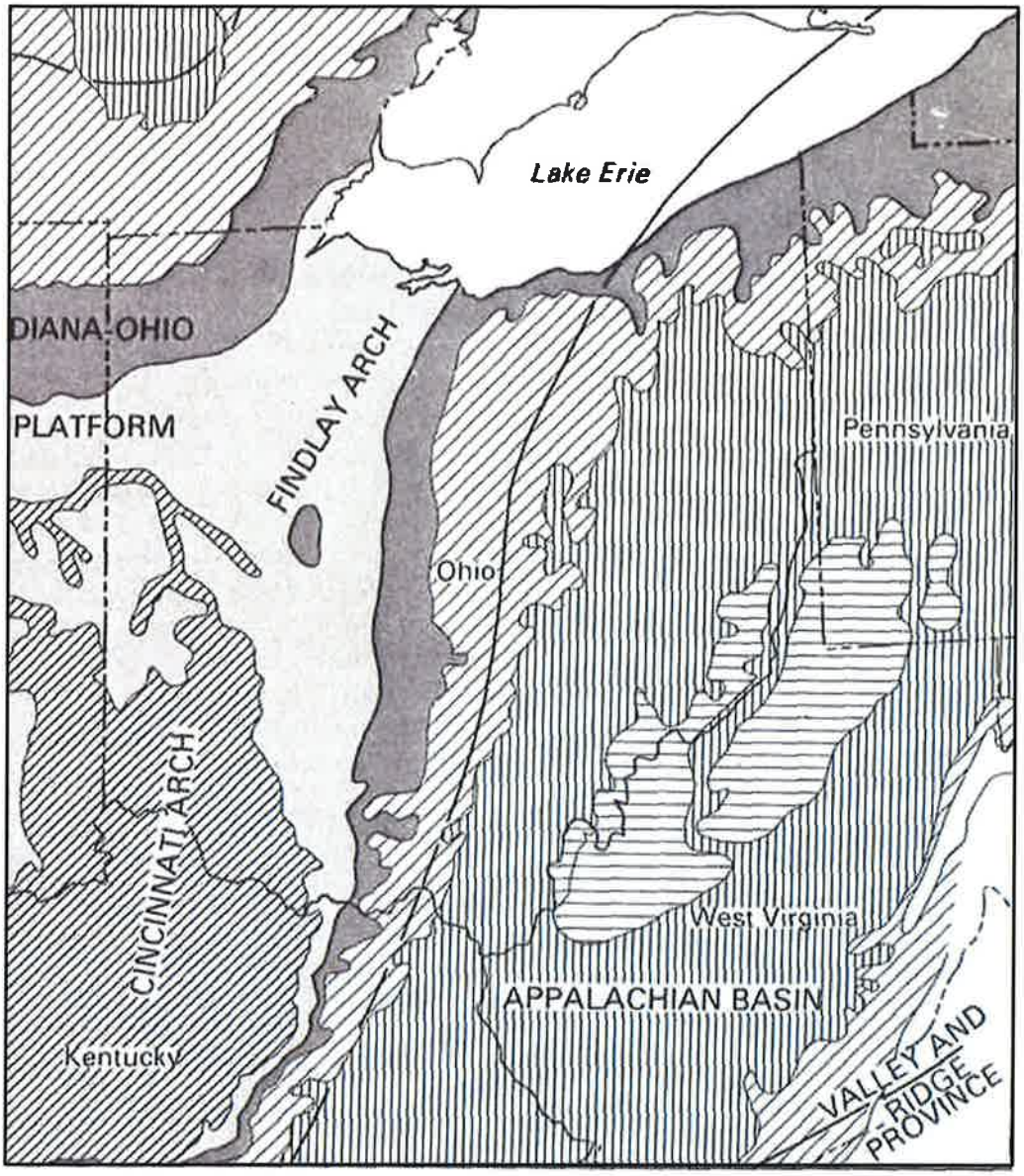


From: Ohio Division of Geologic Survey, 1998, Physiographic Regions of Ohio: Ohio DNR, Division of Geological Survey, page-size map with text, 2 p. scale 1:2,100,000.

ENVIRON

Physiographic Regions of Ohio

Figure 3-2A



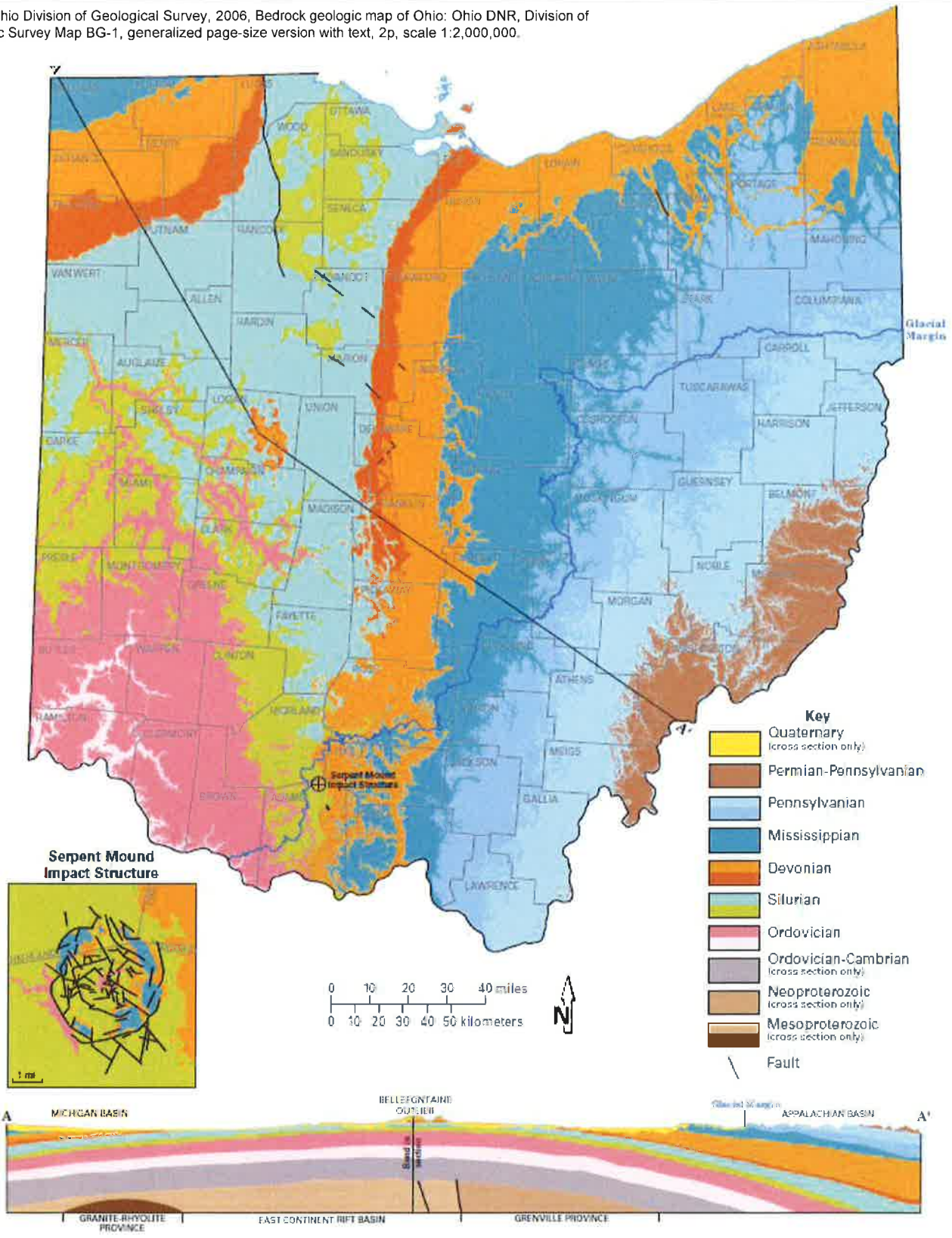
From: Coogan, *Ohio's Surface Rocks and Sediments*. In *Fossils of Ohio*, Ohio DNR Division of Geological Survey Bulletin 70, Figure 3-4.

ENVIRON

Regional Geologic Structures of Ohio

Figure 3-2B

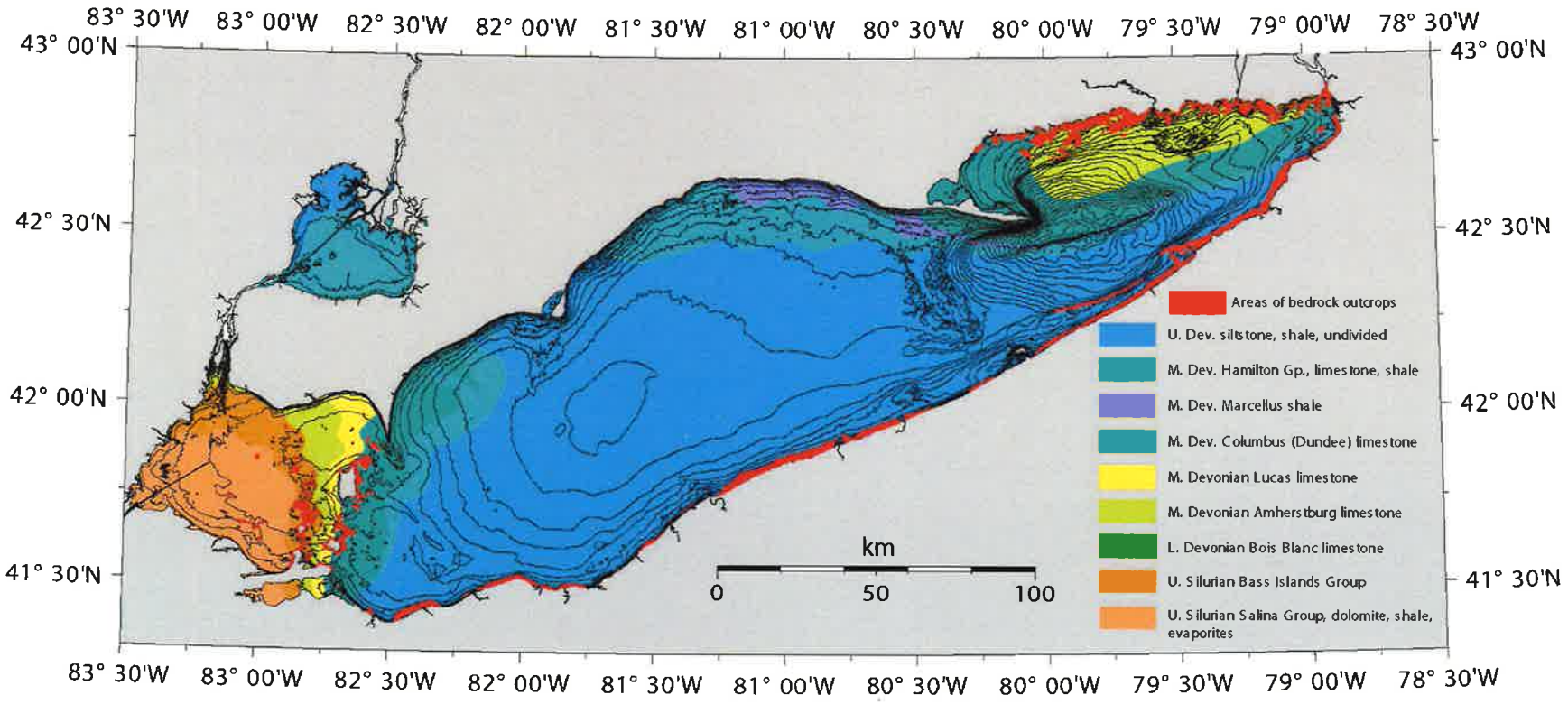
From: Ohio Division of Geological Survey, 2006, Bedrock geologic map of Ohio: Ohio DNR, Division of Geologic Survey Map BG-1, generalized page-size version with text, 2p, scale 1:2,000,000.



ENVIRON

Bedrock Geologic Map of Ohio

Figure 3-2C

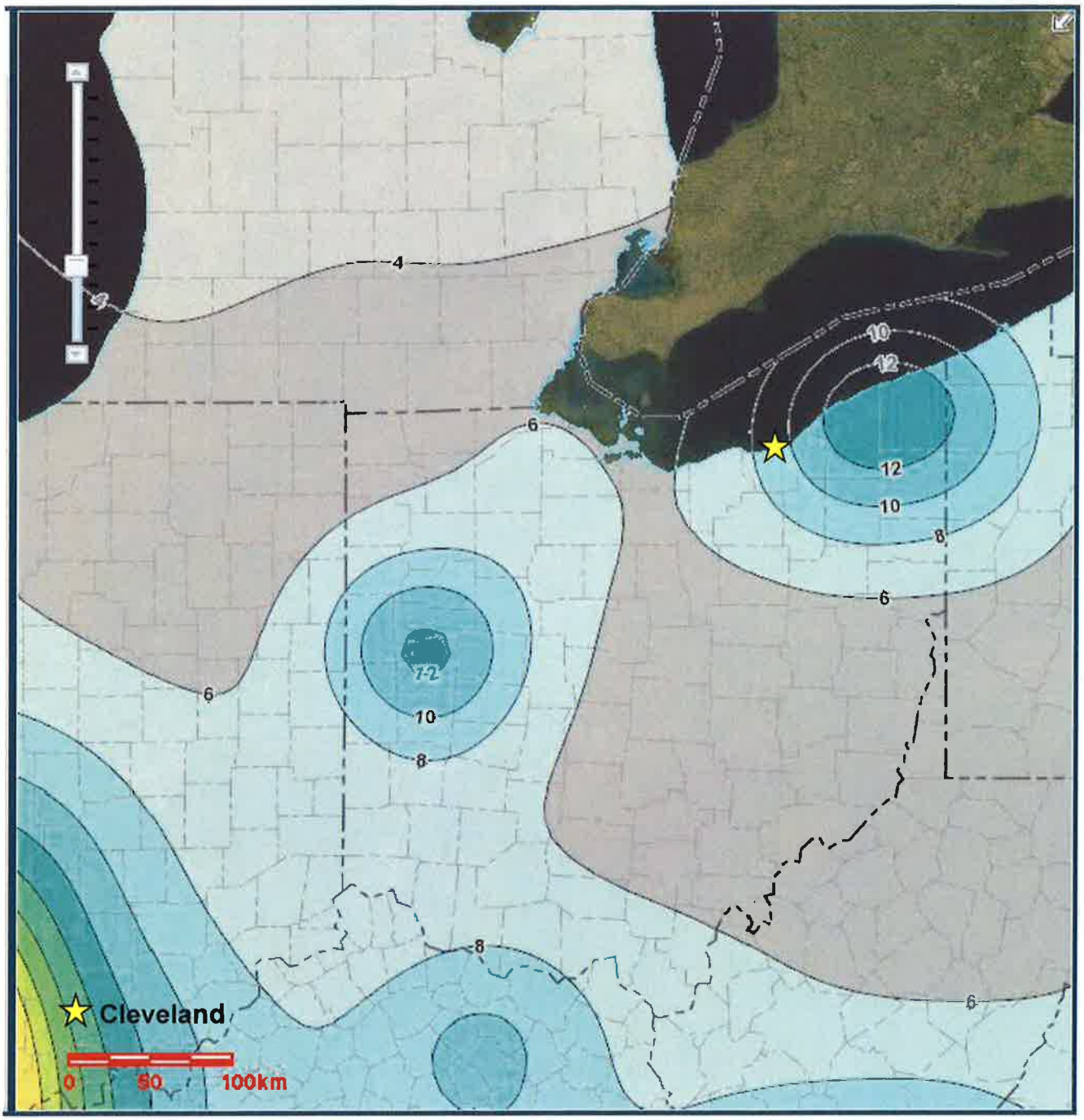


From: Holcombe et al., Lake-Floor Geomorphology of Lake Erie, Figure 2.

ENVIRON

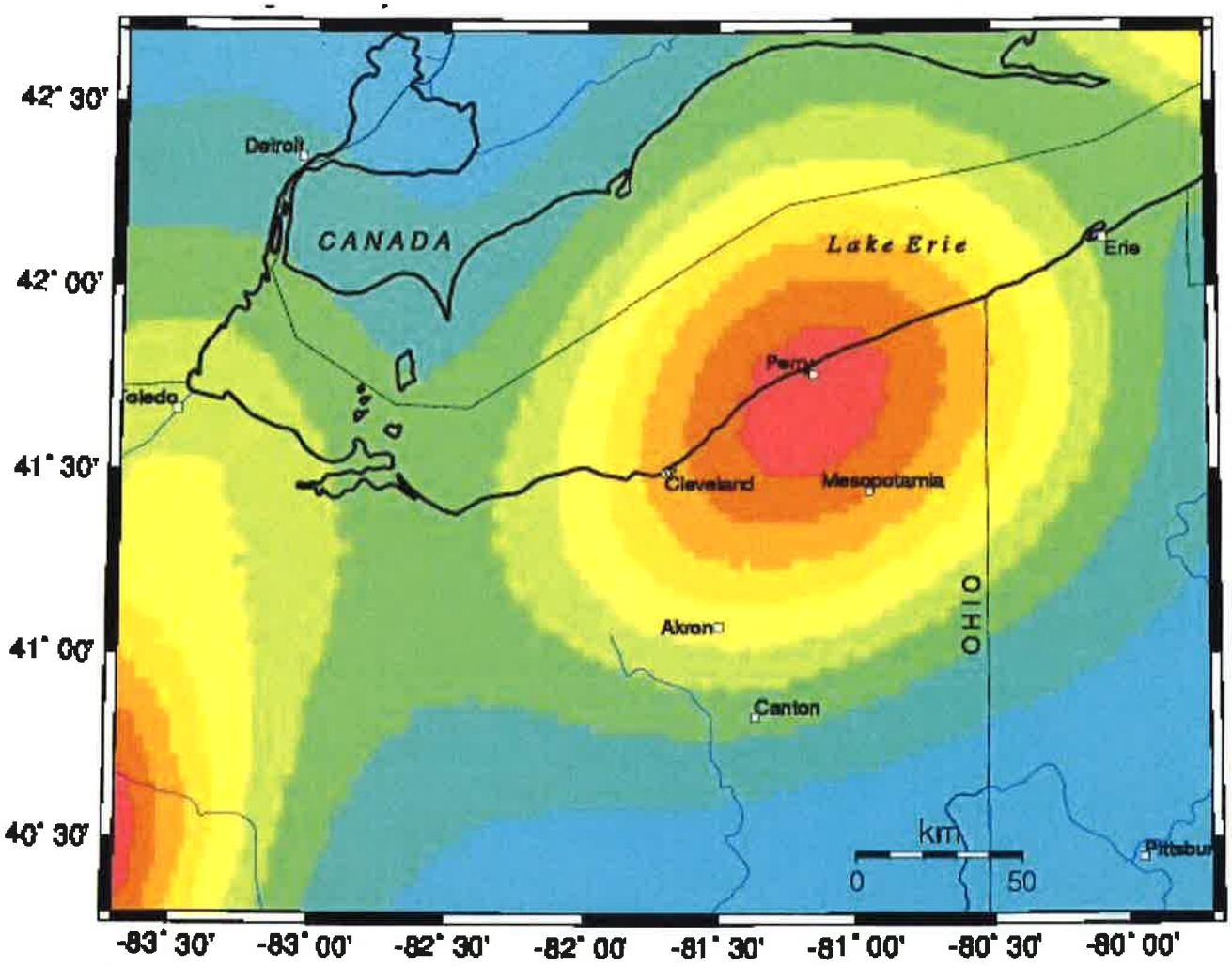
Bedrock Geologic Map of the Lake Erie Basin

Figure 3-2D

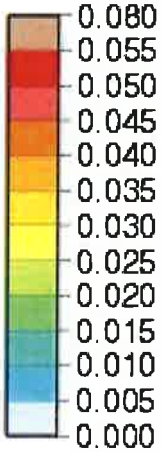


From: USGS Earthquake Hazards Program

ENVIRON	Peak Ground Acceleration with a 2 percent Probability of Exceedance in 50 Years	Figure 3-2E



Probability

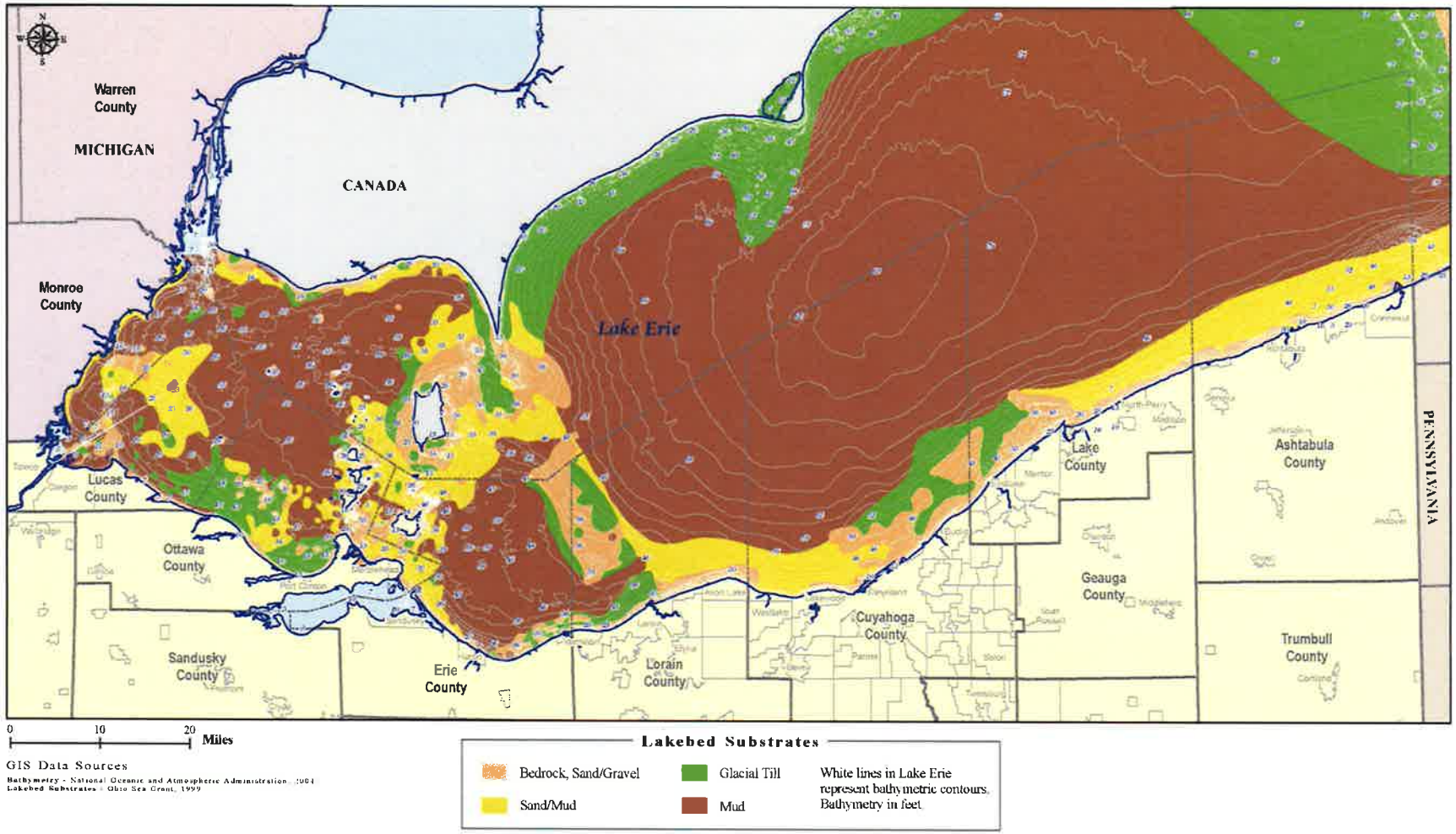


From: USGS Probabilistic Seismic Hazard Assessment Model

ENVIRON

Probability of an Earthquake with a Magnitude Greater than or Equal to 4.75 within 50 Years and 50 Kilometers

Figure 3-2F

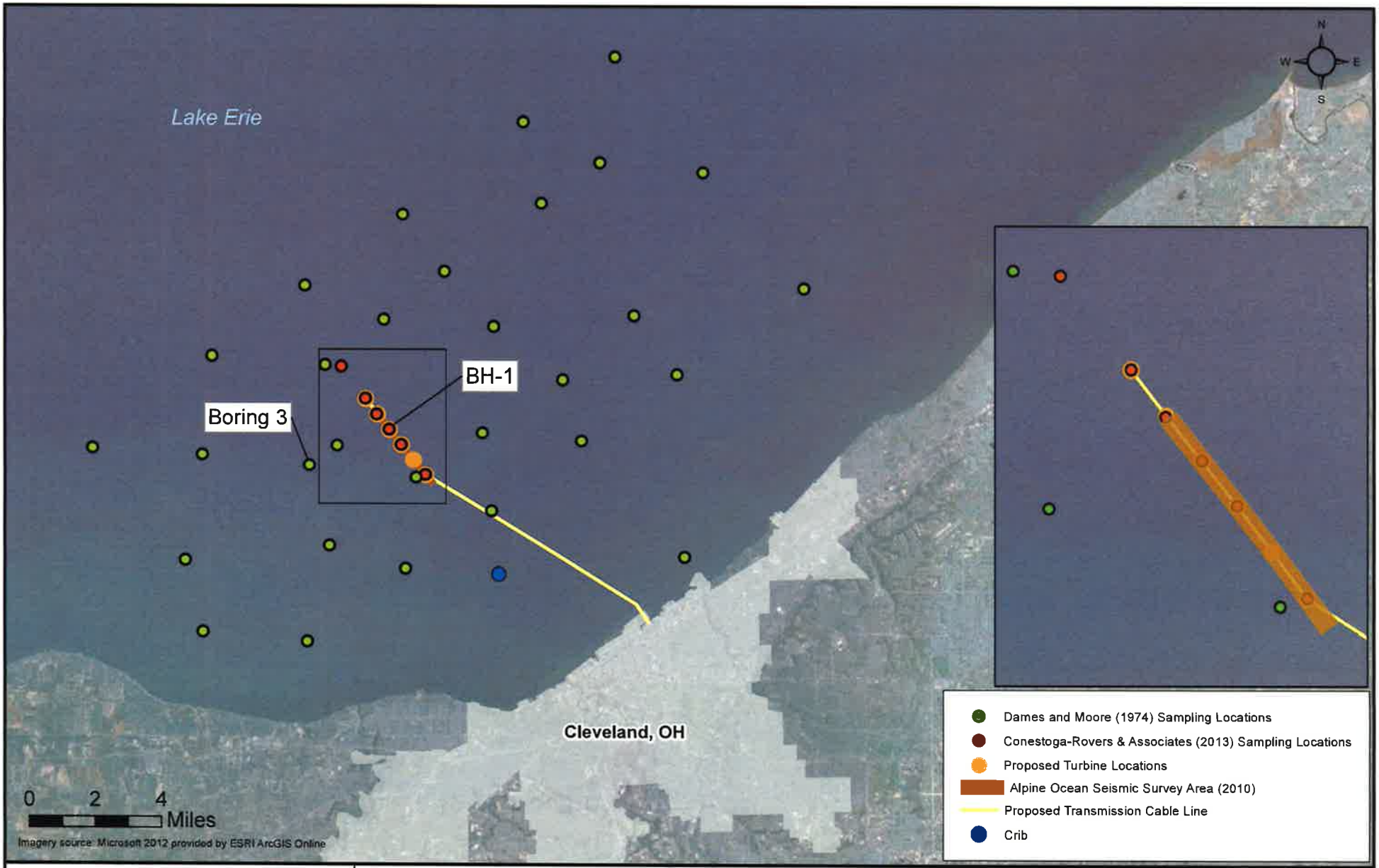


From: Ohio DNR Office of Coastal Management

ENVIRON

Lakebed Substrates Of Lake Erie

Figure 3-2G

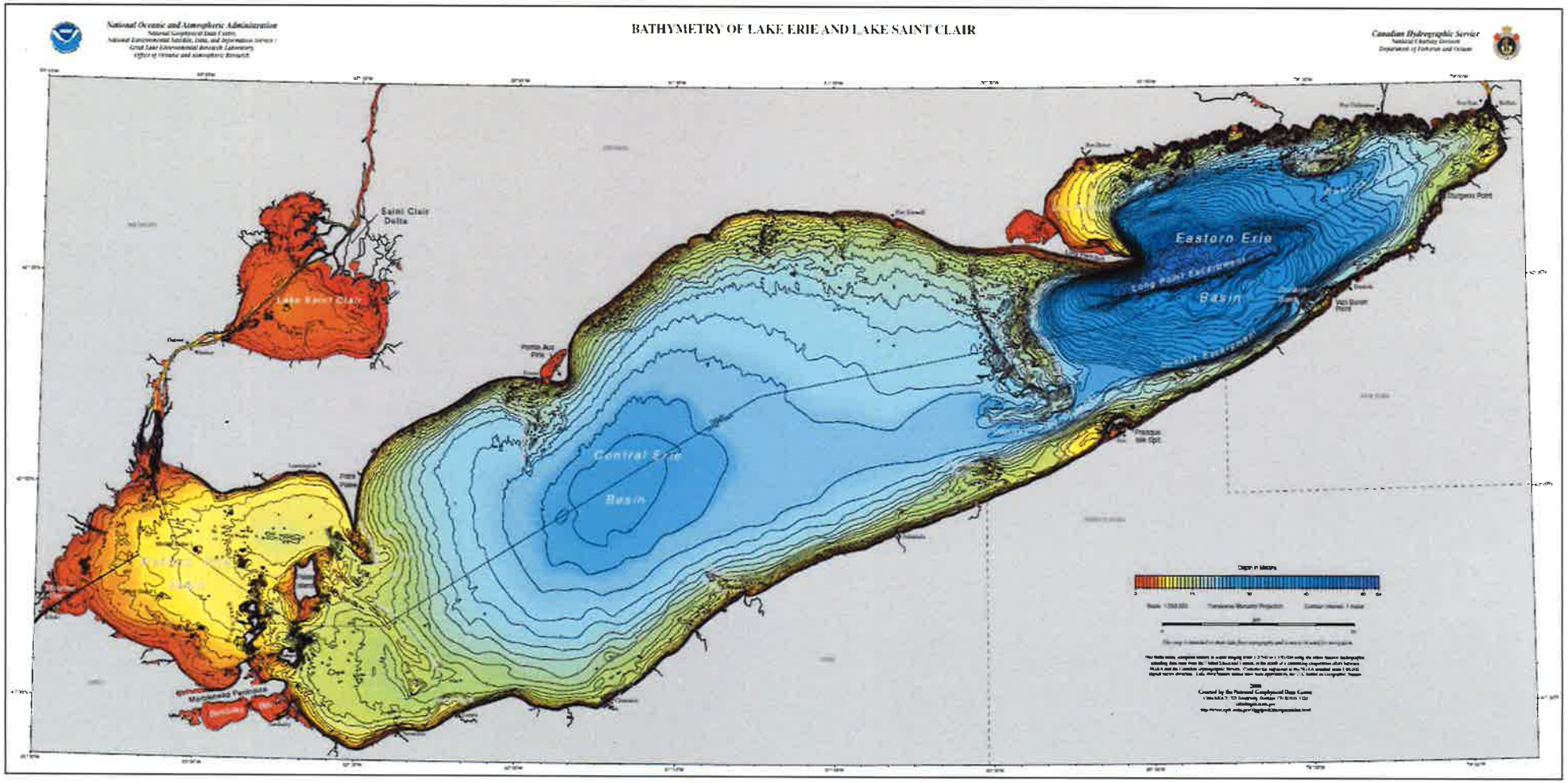


ENVIRON

Geotechnical and Geophysical Study Locations in the Vicinity of Project Icebreaker

Figure 3-2H

1/8/2014 M:\LeedCo\GIS\MXD\EA\Fig3-2H_Geophysical.mxd



From: National Oceanic Atmospheric Administration and Canadian Hydrographic Service

ENVIRON

Bathymetry of Lake Erie and Lake Saint Clair

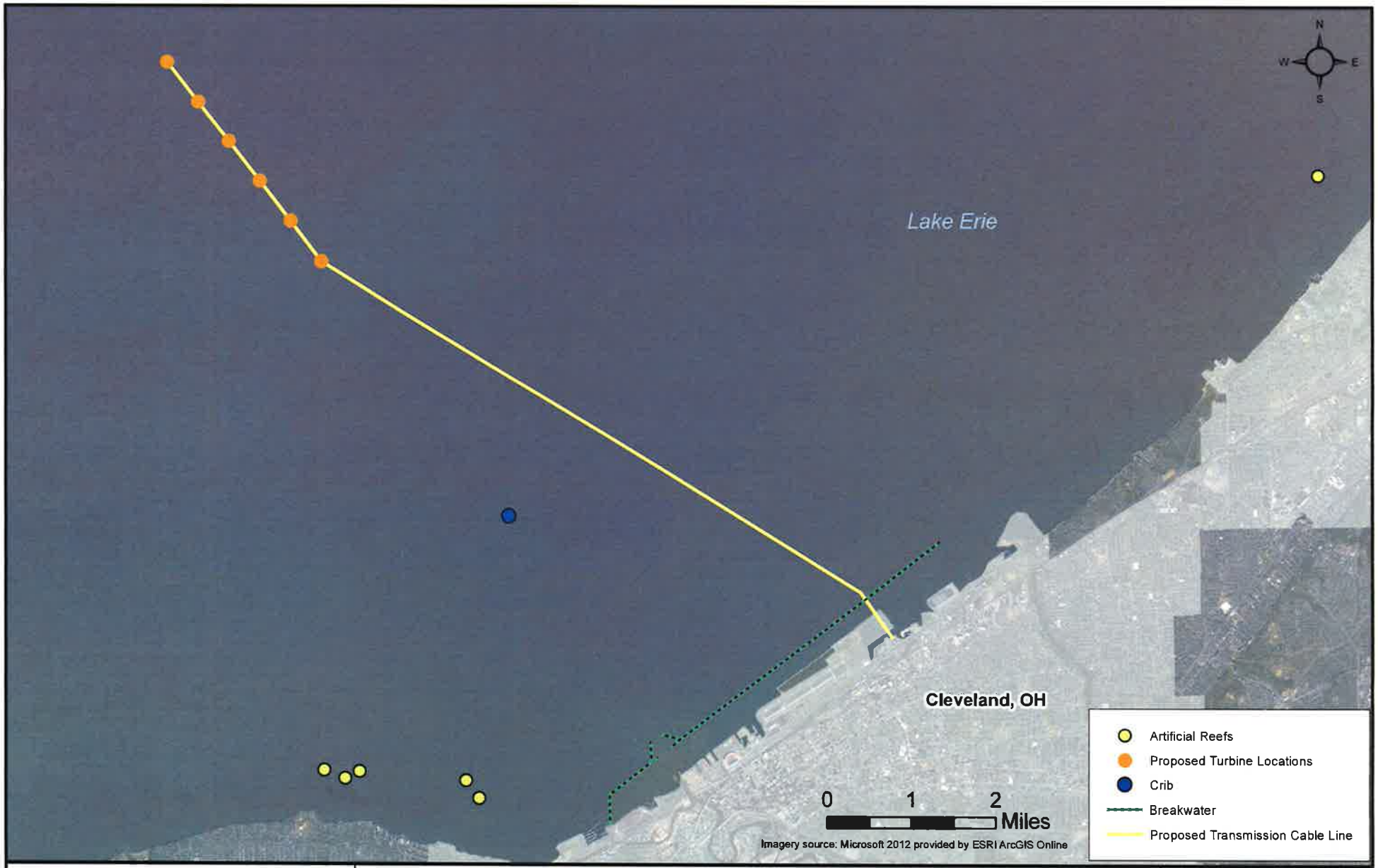
Figure 3-3A

FIG. 8. Lake Erie surficial sediment total mercury concentrations (µg/g) in samples collected in 1971. The Canadian Sediment Quality threshold effect level (TEL) is 0.174 µg/g and the probable effect level (PEL) is 0.486 µg/g.

FIG. 7. Lake Erie surficial sediment total mercury concentrations (µg/g) in samples collected in 1997/98. The Canadian Sediment Quality threshold effect level (TEL) is 0.174 µg/g and the probable effect level (PEL) is 0.486 µg/g.

From: Painter et al. 2001

ENVIRON	Mercury Concentrations in Lake Erie Sediment - 1971 and 1997/1998	Figure 3-4A



ENVIRON

Artificial Reefs in the Vicinity of Project Icebreaker

Figure 3-6A

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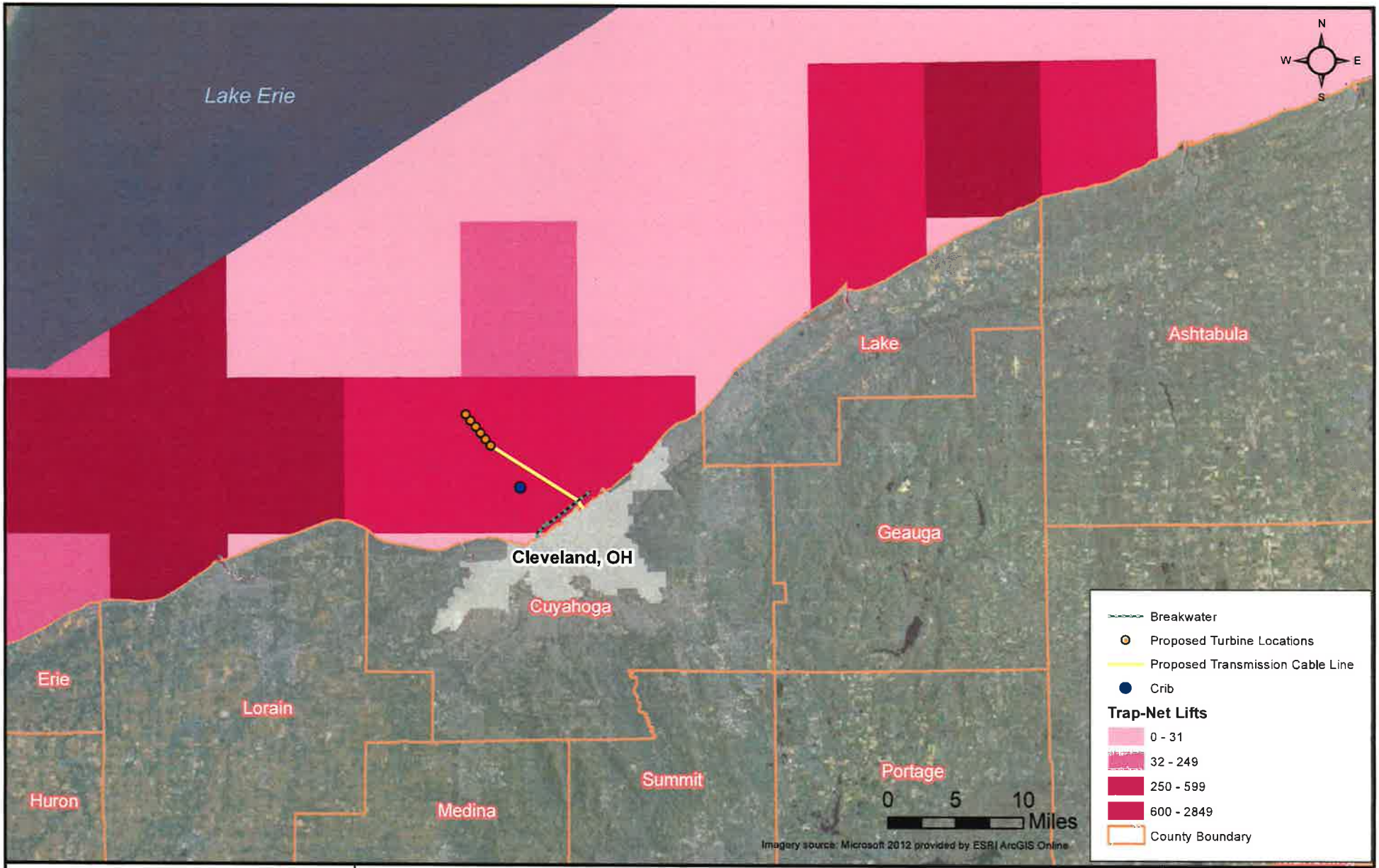
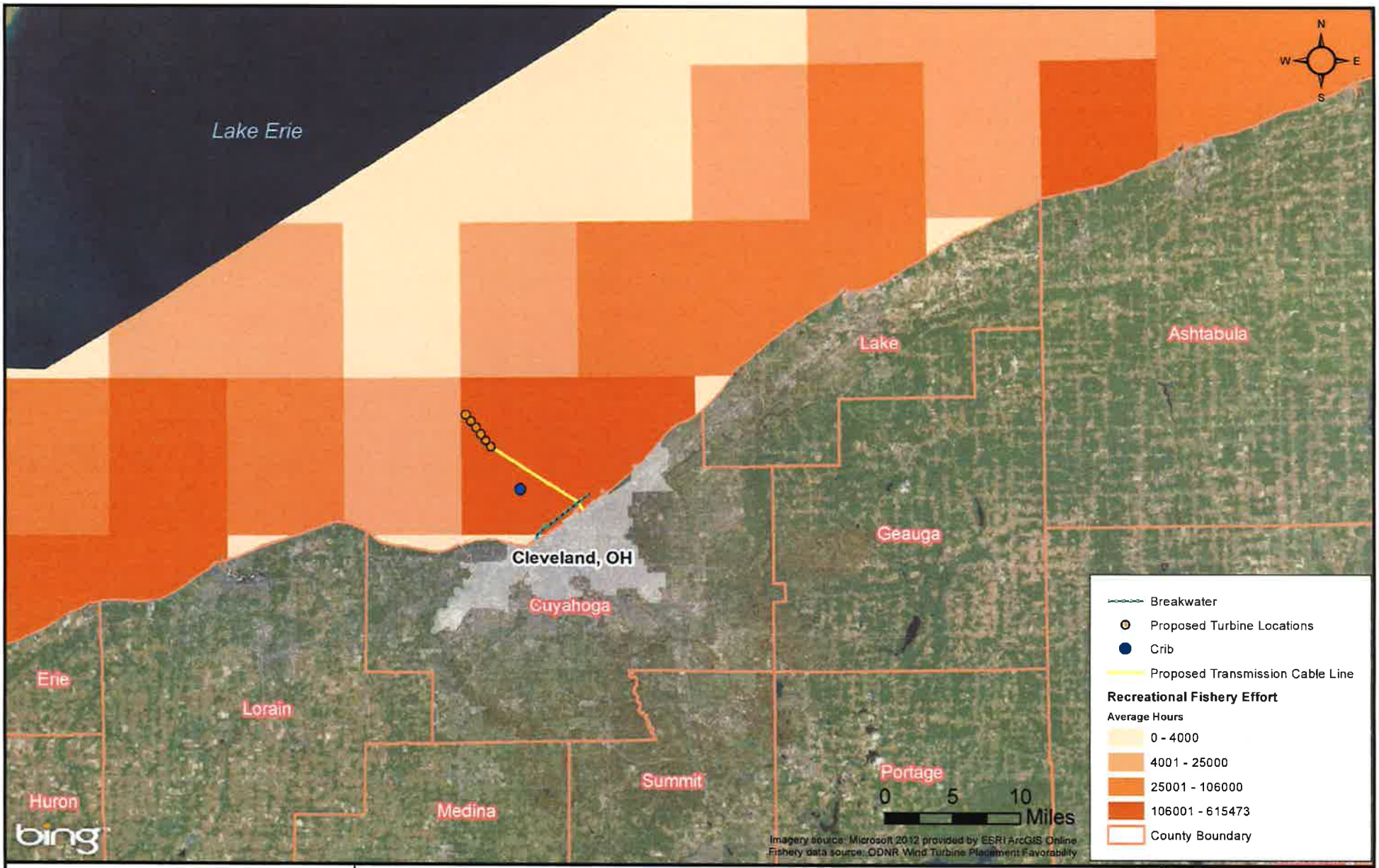


ENVIRON

Commercial Fishing in the Vicinity of Project Icebreaker

Figure 3-6B

1/8/2014 M:\LeedCo\GIS\MXD\EA\Fig3-6B_CommercialFish.mxd

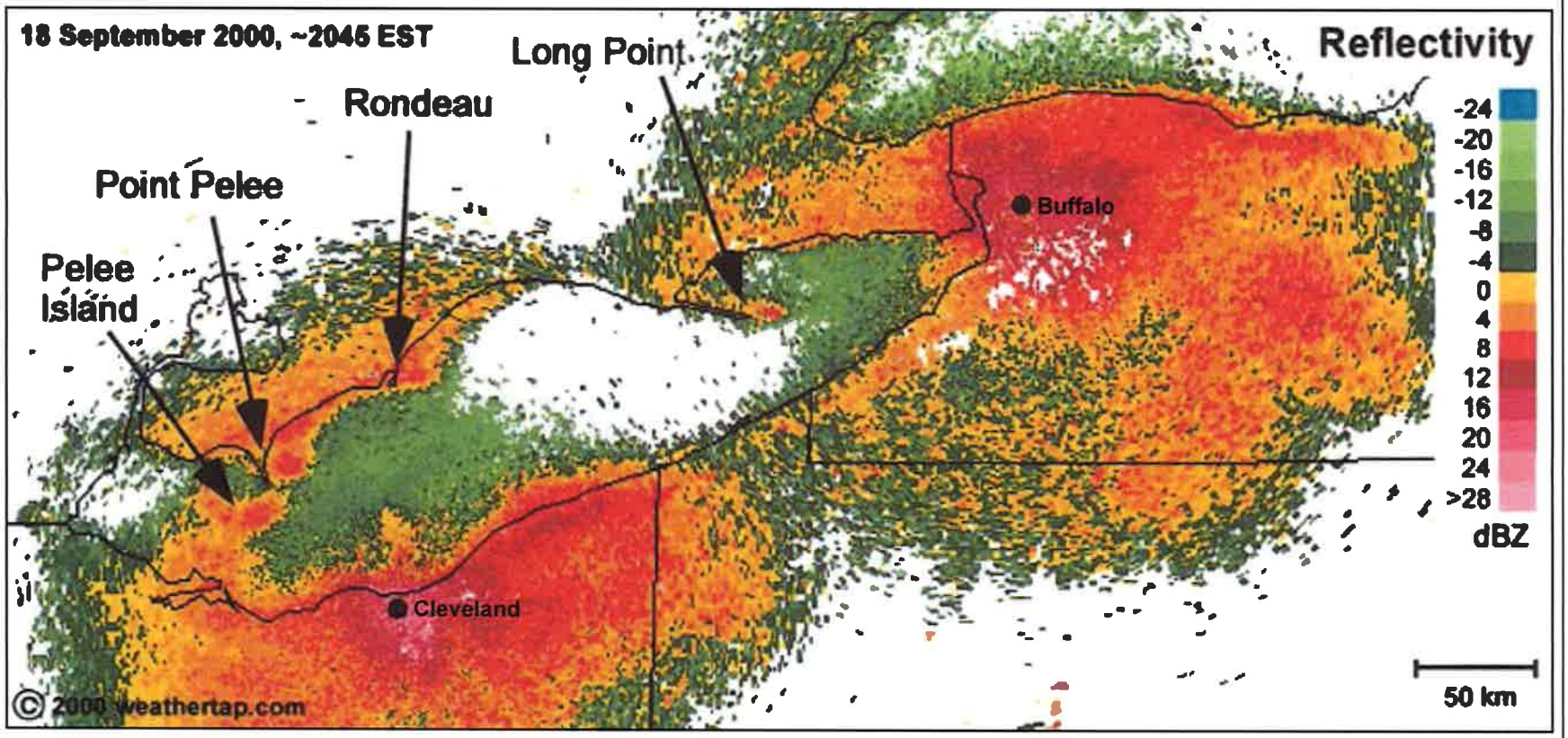


ENVIRON

Recreational Fishing in the Vicinity of Project Icebreaker

Figure 3-6C

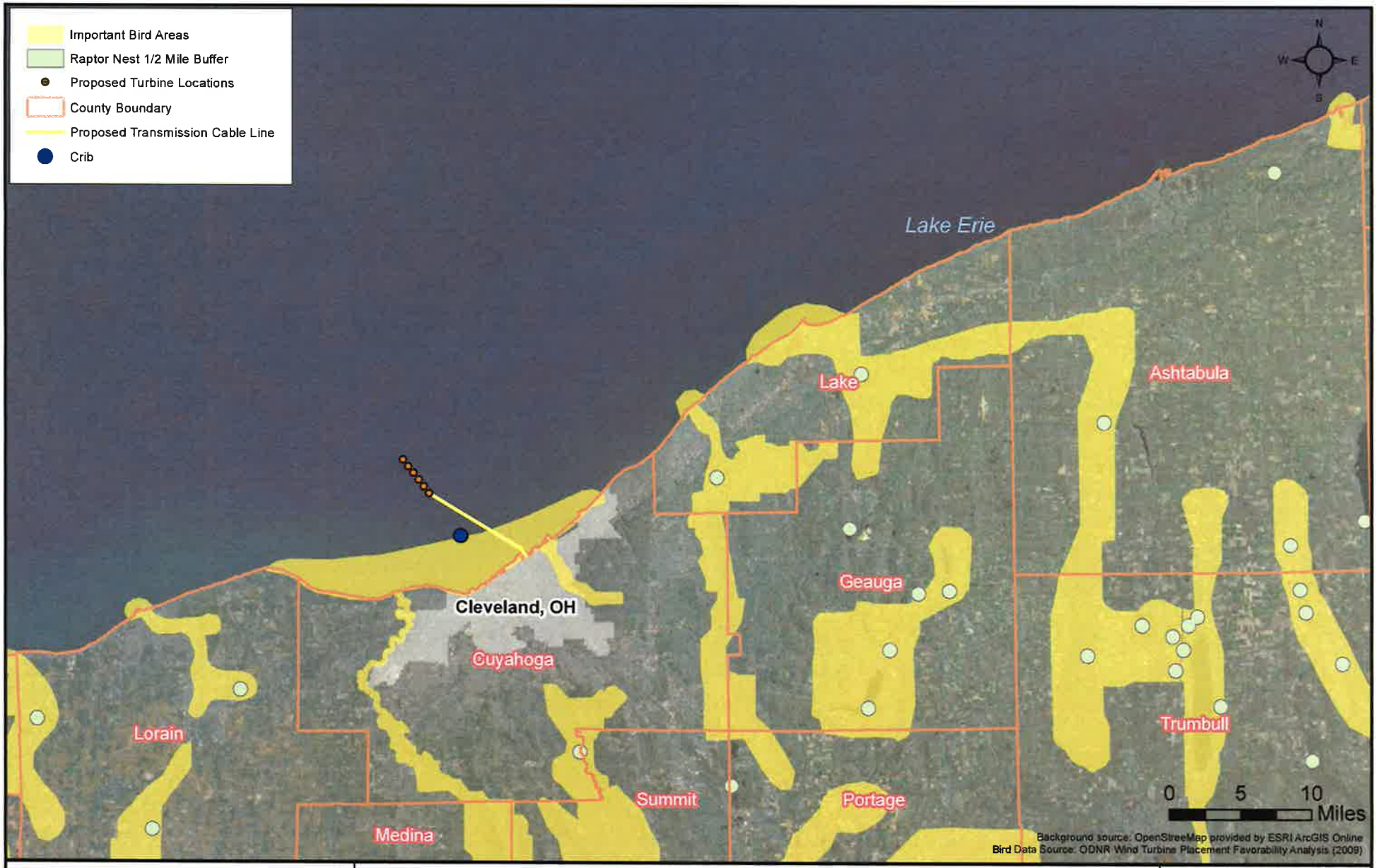
1/8/2014 M:\LeedCo\GIS\MXD\EA\Fig3-6C_RecreationalFish.mxd



Takeoff on 18 September 2000 as seen by radar in Cleveland, Ohio, and Buffalo, New York, ~1.3 h after local civil sunset. Images were combined to highlight habitat use patterns revealed at takeoff. The takeoff pattern at Buffalo (1934 hours) occurred 19 min before that at Cleveland (1953 hours) because of the sun setting later further west. Concentrations appear along the southern coast of both lakes Erie and Ontario. Pelee Island, Point Pelee, Rondeau, and Long Point along the northern coast of Lake Erie give rise to particularly strong bird echoes. Extremely weak echoes over water at that time are of unknown origin but are probably not birds. White patches showing no echo south of Buffalo (KBUF) result from ground clutter (e.g. topography) causing the radar to automatically reject all echoes from those areas. Courtesy of WeatherTAP.com

From: Diehl et al. 2003

ENVIRON	Bird Densities Near the Lakeshore	Figure 3-6D



ENVIRON

Cleveland Lakefront Important Bird Area and Locations of Raptor Nests

Figure 3-6E

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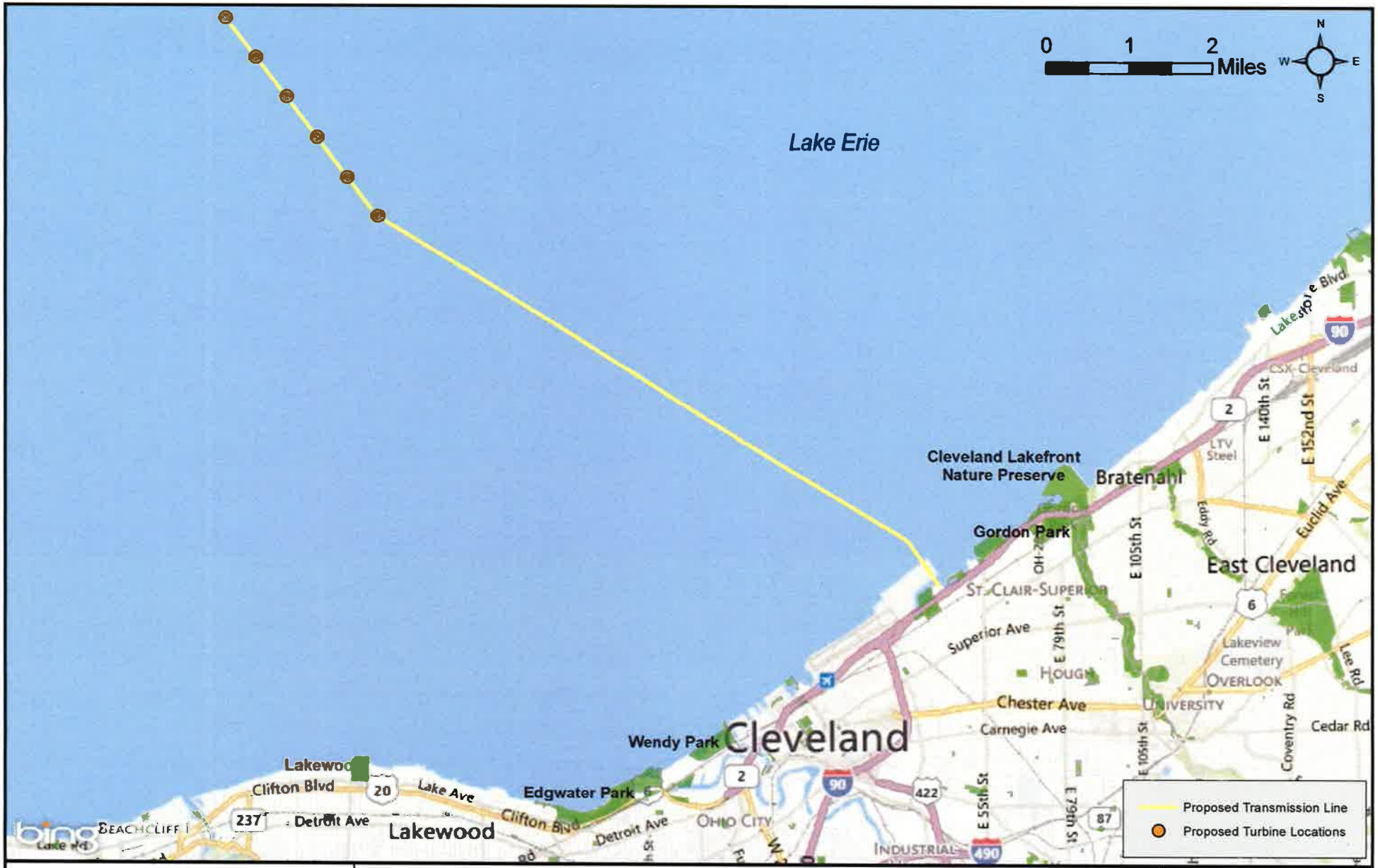
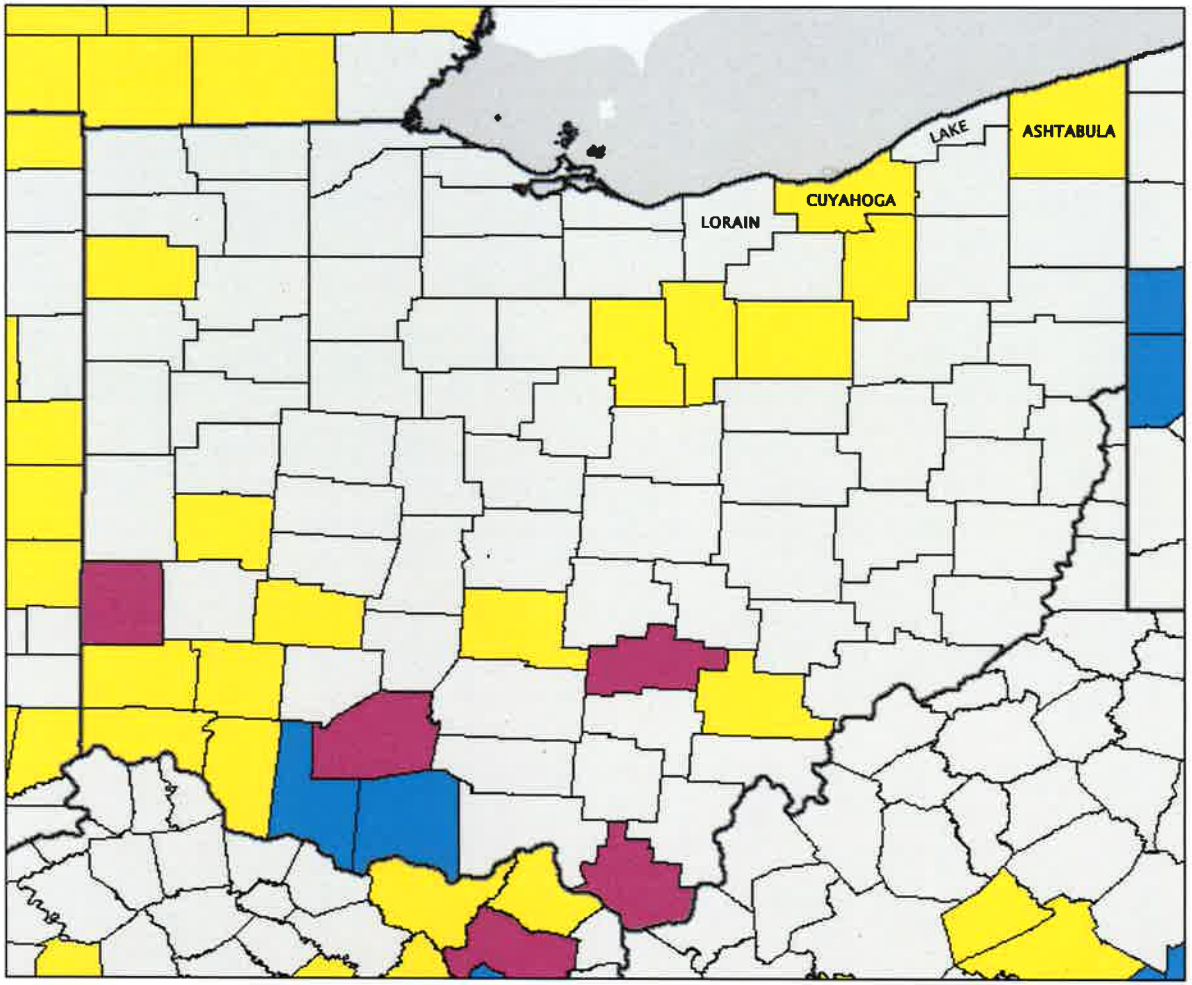


ENVIRON

Parks and Preserves in the Cleveland Area

Figure 3-6F

1/8/2014 M:\LeedCo\GIS\MXD\EA\Fig3-6F_Parks.mxd

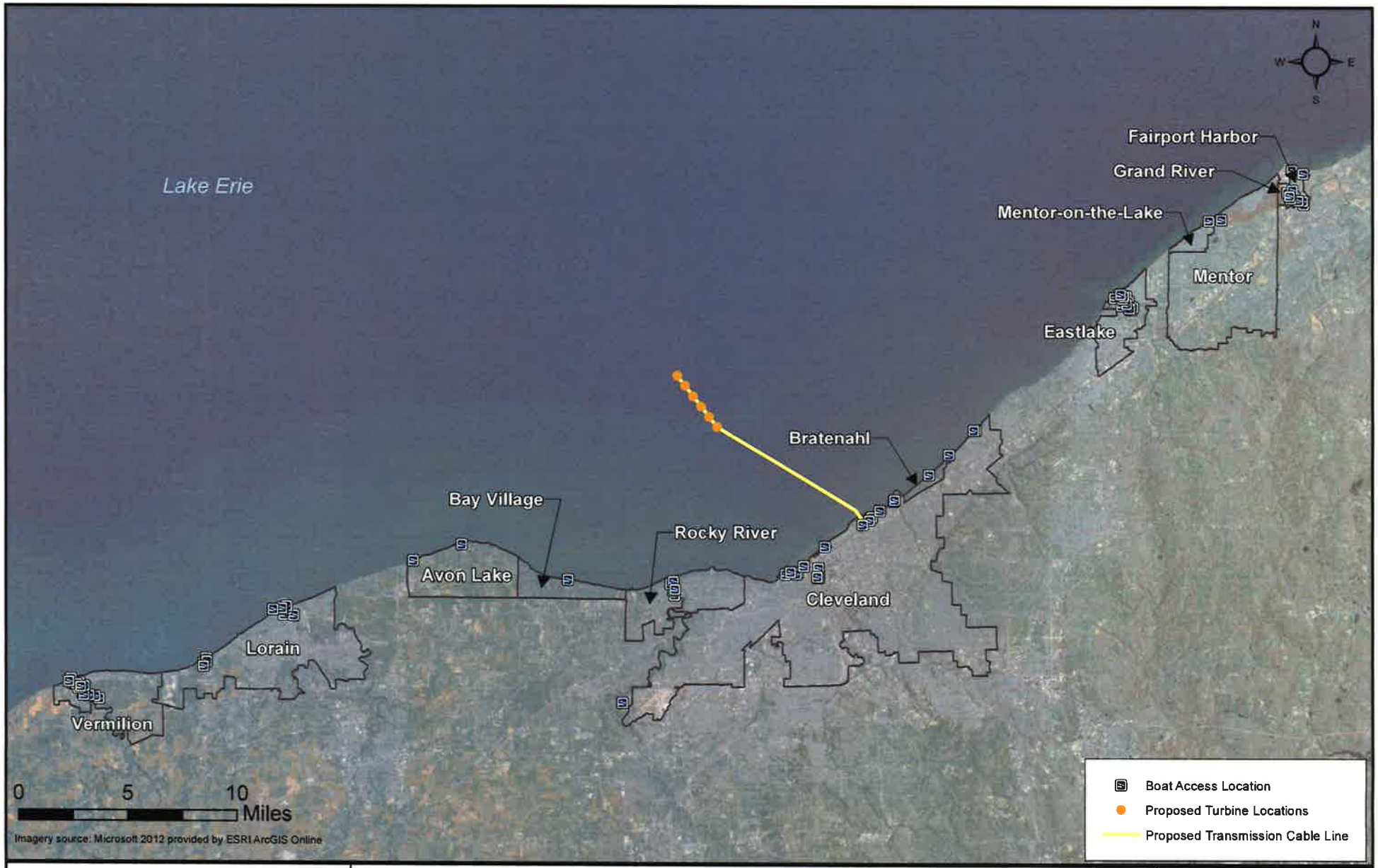


Recreated from: USFWS 2011b

ENVIRON

Indiana Bat Habitat in Ohio

Figure 3-6G



ENVIRON

Boat Access in the Vicinity of Project Icebreaker

Figure 3-8A

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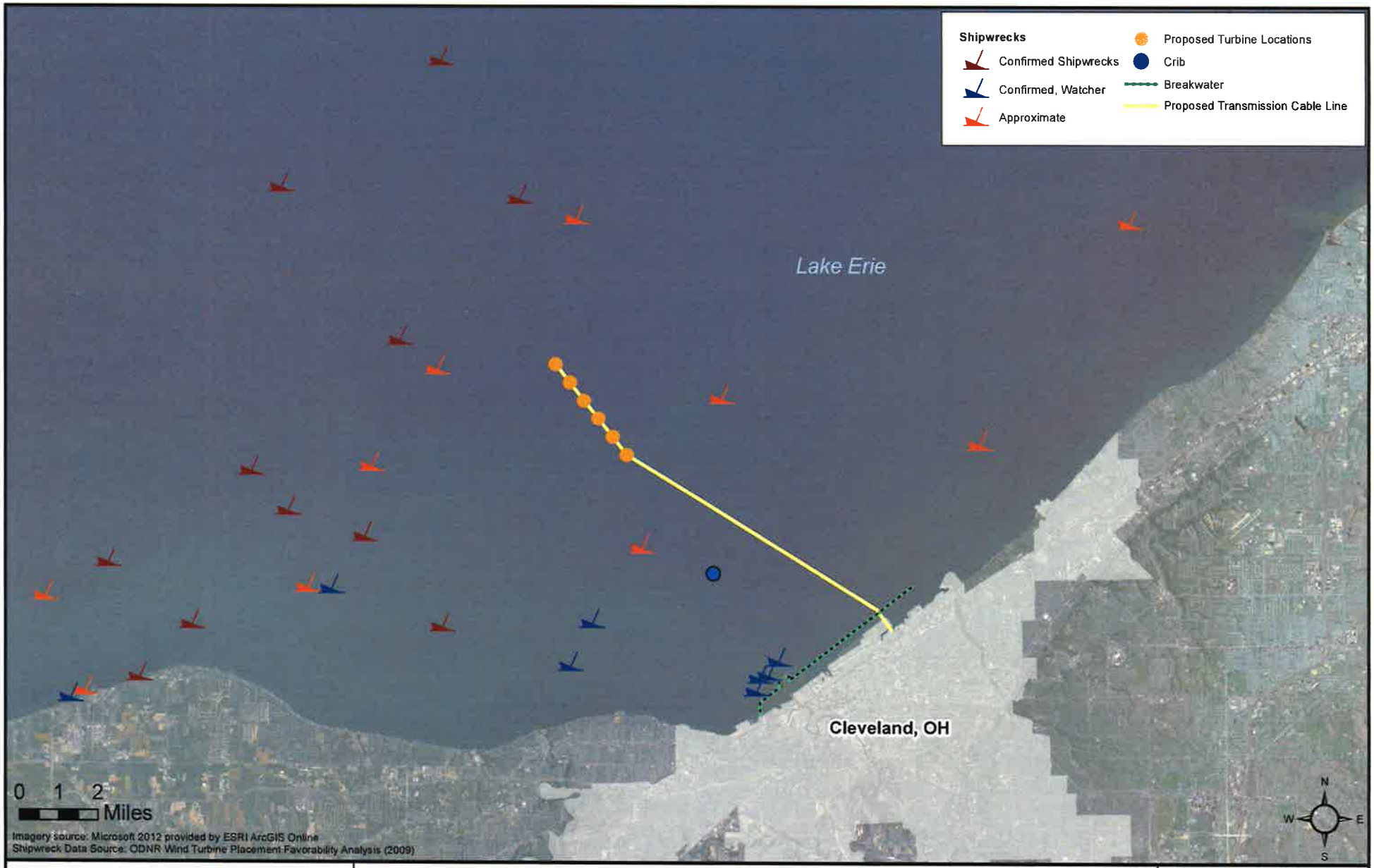
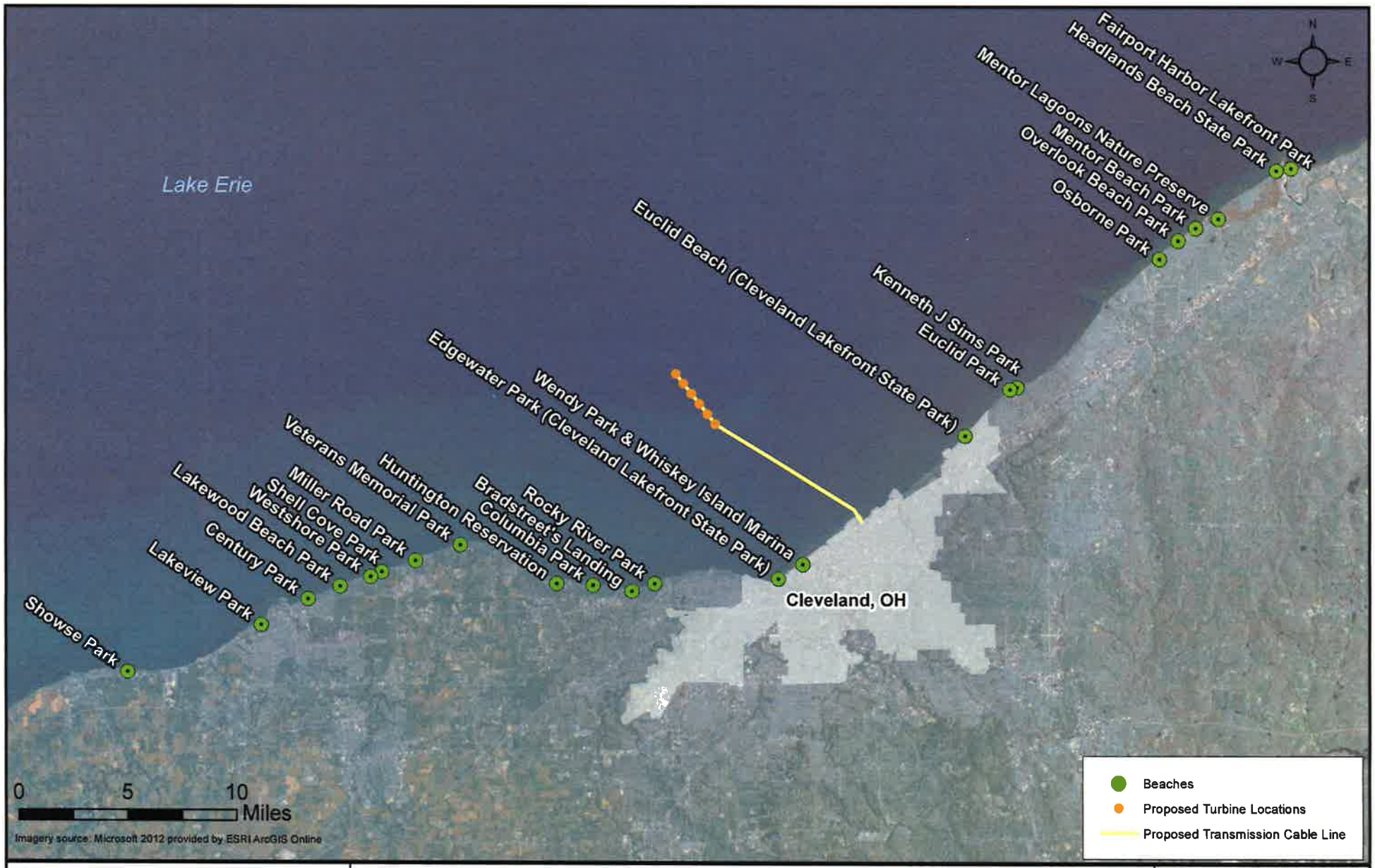


ENVIRON

Shipwrecks in the Vicinity of Project Icebreaker

Figure 3-8B



ENVIRON

Public Shoreline Recreation Areas in the Vicinity of Project Icebreaker

Figure 3-8C

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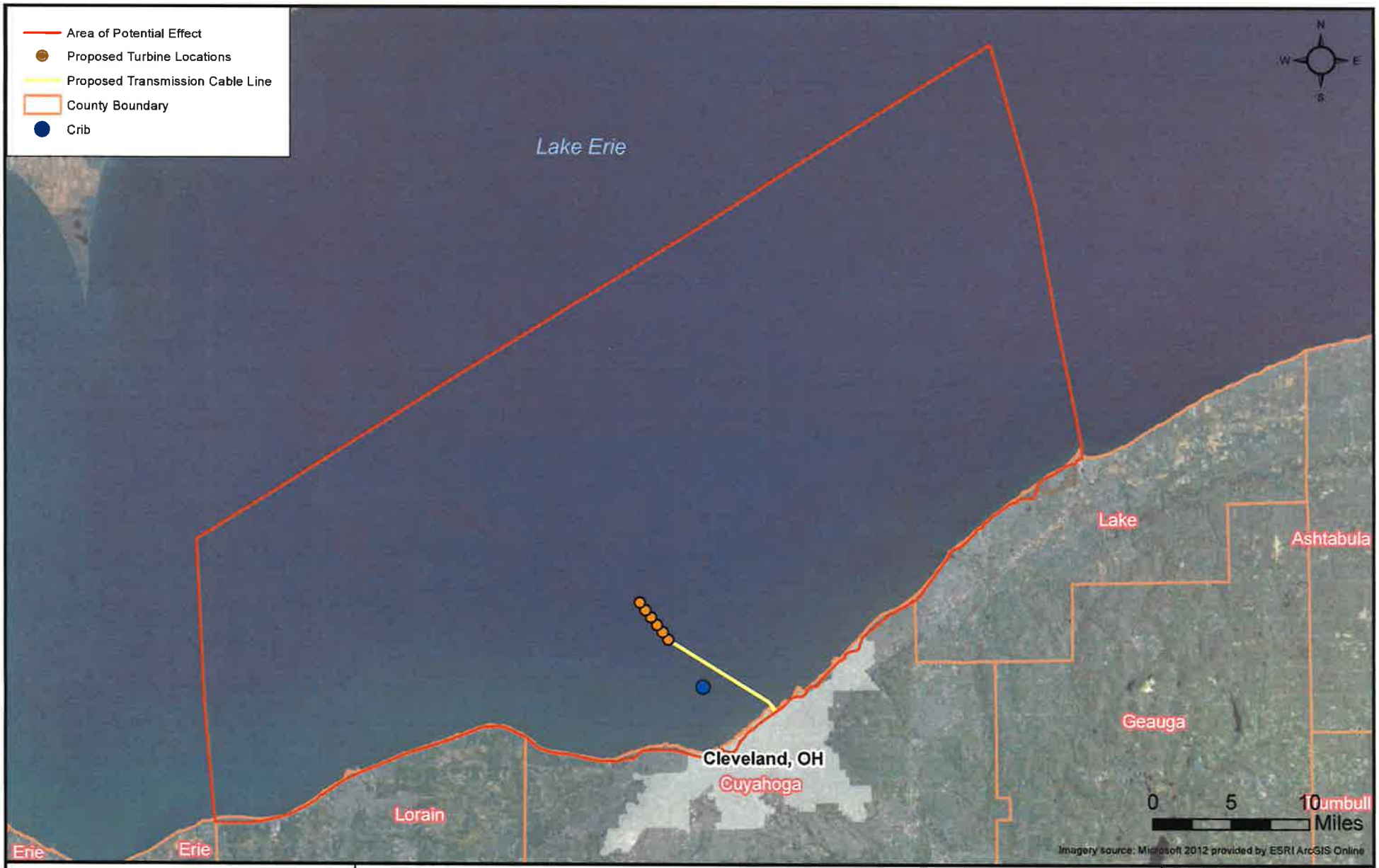
ENVIRON

Lakefront Reservation Areas in the Vicinity of Project Icebreaker

Figure 3-8D

1/8/2014 M:\LeedCo\GIS\MXD\EA\Fig 3-8D Reservations.mxd

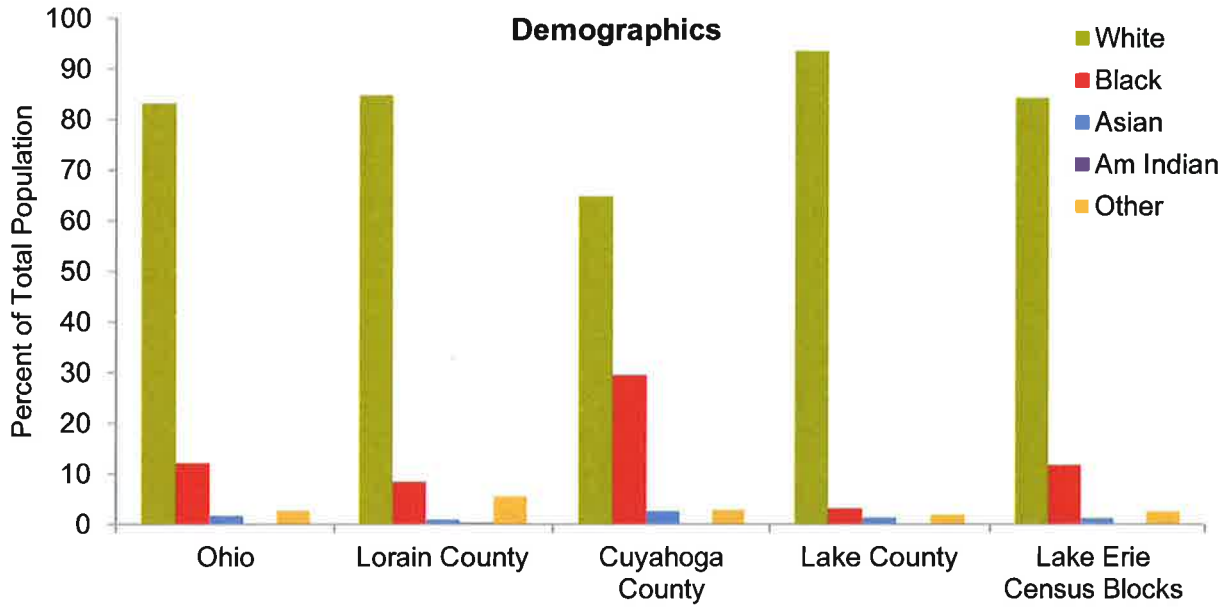


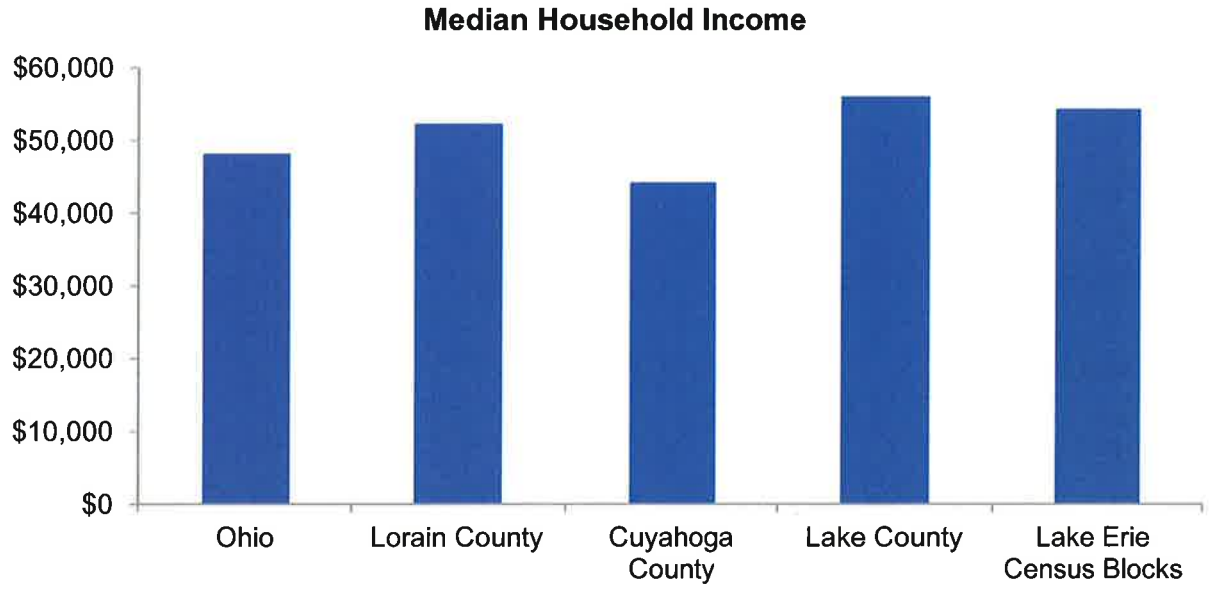
ENVIRON

Area of Potential Effect for Project Icebreaker

Figure 3-9A

1/8/2014 M:\LeedCo\GIS\MXD\EA\Fig3-9A_APE.mxd





ENVIRON

Demographics and Median Household Income of Ohio and Project Icebreaker Affected Counties

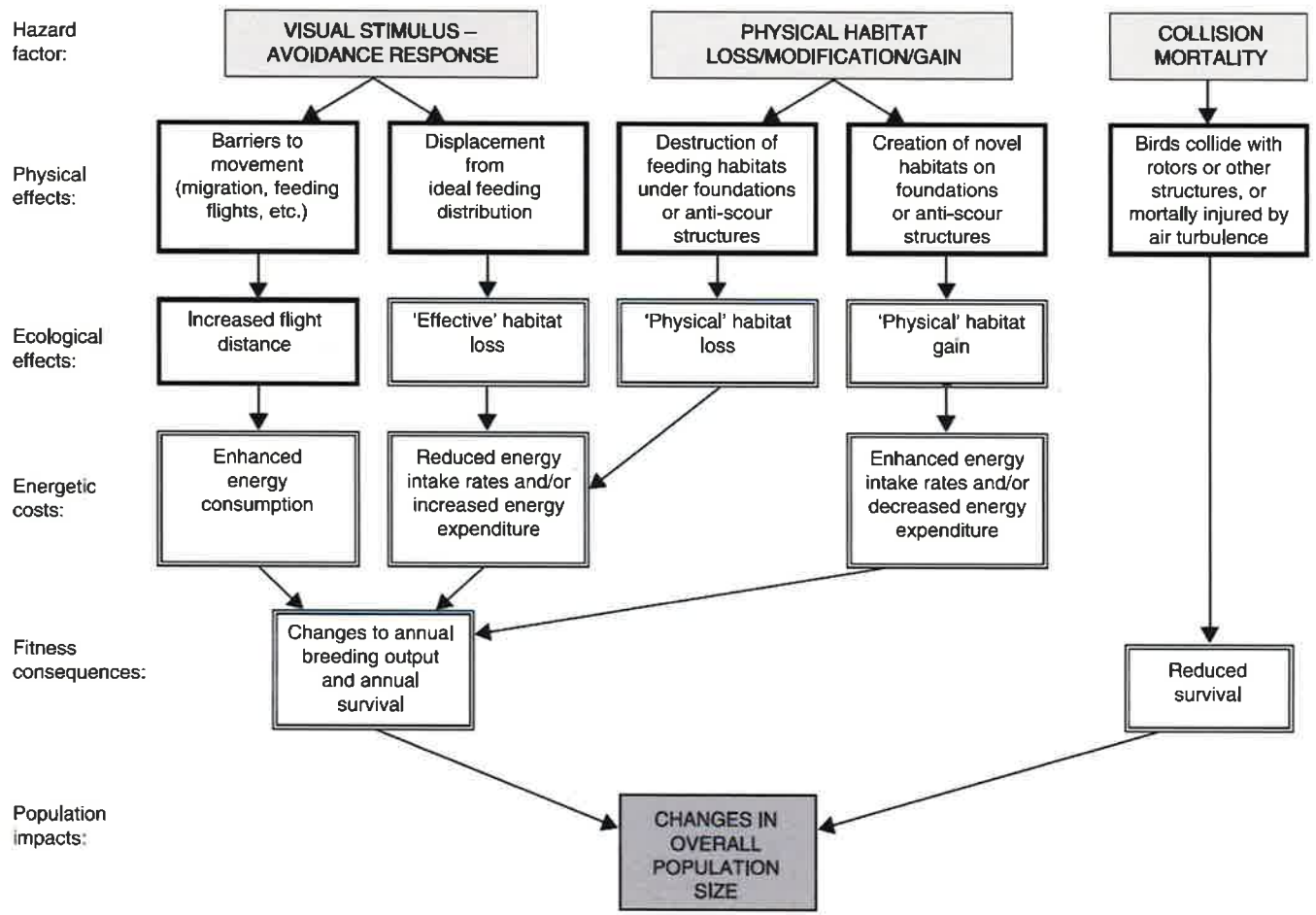
Figure 3-10A

ENVIRON

Lakebed Substrates in the Vicinity of Project Icebreaker

Figure 4-2A

1/8/2014 M:\LeedCo\GIS\MXD\EA\Fig4-2A_LakebedSubstrate.mxd



Flow chart describing the three major hazard factors presented to birds by the construction of off shore wind farms, showing their physical and ecological effects on birds, the energetic costs and fitness consequences of these effects and their ultimate impacts on the population level. The boxes with a heavy solid frame indicate potentially measurable effects, the double framed boxes indicate processes that need to be modeled and the dark box represent the common currency by which all adverse effects can be compared (adopted from Paper I).

From: Desholm 2006

ENVIRON

Major Hazards to Birds Created by Offshore Wind Farms

Figure 4-2B

Summary: Exhibit SUPPLEMENTAL EXHIBIT 7: ENVIRONMENTAL ASSESSMENT TABLES AND FIGURES TO APPLICATION OF LAKE ERIE ENERGY DEVELOPMENT CORPORATION (LEEDCO) FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY FOR PROJECT ICEBREAKER electronically filed by Ms. Andrea M. Salimbene on behalf of LEEDCo