APPENDIX E REMEDIATION EVALUATION
HERO LANDS PROPERTY, PLAQUEMINES PARISH, LA

Loss of Wetland Function Based on ICON Proposed Soil Remediation					
Description of Wetland Function or Service	Units of Measure or Rate	Ability of Wetland to Provide Service (Estimate from Literature)	**Service currently Provided at Property** ***There are currently approximately 88.9 acres of mature trees on the property.***	**Service Lost due to ICON Soil Remediation** ***ICON's Soil Remediation would remove 6.5 acres of mature treed forest.***	Reference
Gallons of storm water held per acre of wetland	gallons/acre	1 - 1.5 million gallons of water held/acre	88.9 - 133.35 million gallons of water estimated to be held in the property wetlands	A reduction of an estimated 6.5 - 9.75 million gallons of water held by the wetlands, and therefore released as overland flow	Barbier, 2013; USGS, 1997
CO_2 absorbed per acre vegetation	metric tons/acre; MgC/ha/yr (Mg C is metric tons of carbon)	Mean annual increment at year 50 of 4.43 metric tons of CO_2 equivalent per acre per year (Shoch, 2009); 1.9 MgC/ha/yr to 3.4 MgC/ha/yr (Moerschbaecher, 2016)	Currently the forested areas are holding an estimated 68 - 394 metric tons of CO_2 per year	The remediation would cause an estimated increase of CO_2 released to the atmosphere of 4.9 - 29 metric tons	Moerschbaecher et al., 2016; Shoch et al. 2009
Amount CO_2 released per gallon of diesel burned	pounds/gallon fuel burned	22 pounds CO_2 released/gallon of fuel burned	50 gallons burned/acre cleared	7,150 pounds CO_2 released (3.2 metric tons)	See reference websites below
Increase in local temperature per acre removed (estimated from urban setting)	°C/acre	10% loss in tree canopy cover causes 0.7°C increase in land surface temperature	There are currently 88.9 acres of tree canopy.	Removal of 6.5 acres would constitute a 7% loss in tree canopy cover, which could result in a land surface temperature increase of 0.5°C	Rogan et al. 2013

Notes

Of the 154.7 acres that define the property, 88.9 acres are covered with substantial vegetative cover.

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Loss of Wetland Function Based on ICON Proposed Groundwater Remediation					
Description of Wetland Function or Service	Units of Measure or Rate	Ability of Wetland to Provide Service (Estimate from Literature)	**Service currently Provided at Property** ***There are currently approximately 88.9 acres of mature trees on the property.***	**Service Lost due to ICON GW Remediation** ***ICON's GW Remediation would remove 5.1 acres of mature treed forest.***	Reference
Gallons of storm water held per acre of wetland	gallons/acre	1 - 1.5 million gallons of water held/acre	88.9 - 133.35 million gallons of water estimated to be held in the property wetlands	A reduction of an estimated 5.1 - 7.65 million gallons of water held by the wetlands, and therefore released as overland flow	Barbier, 2013; USGS, 1997
CO_2 absorbed per acre vegetation	metric tons/acre; MgC/ha/yr (Mg C is metric tons of carbon)	Mean annual increment at year 50 of 4.43 metric tons of CO_2 equivalent per acre per year (Shoch, 2009); 1.9 MgC/ha/yr to 3.4 MgC/ha/yr (Moerschbaecher, 2016)	Currently the forested areas are holding an estimated 68 - 394 metric tons of CO_2 per year	The remediation would cause an estimated increase of CO_2 released to the atmosphere of 2.3 to 22.6 metric tons	Moerschbaecher et al., 2016; Shoch et al. 2009
Amount CO_2 released per gallon of diesel burned	pounds/gallon fuel burned	22 pounds CO_2 released/gallon of fuel burned	50 gallons burned/acre cleared	5,610 pounds CO_2 released (2.54 metric tons)	See reference websites below
Increase in local temperature per acre removed (estimated from urban setting)	°C/acre	10% loss in tree canopy cover causes 0.7°C increase in land surface temperature	There are currently 88.9 acres of tree canopy.	Removal of 5.1 acres would constitute a 5.7% loss in tree canopy cover, which could result in a land surface temperature increase of 0.4°C	Rogan et al. 2013

Notes

Of the 154.7 acres that define the property, 88.9 acres are covered with substantial vegetative cover.

References

Barbier, E. B., Georgiou, I. Y., Enchelmeyer, B., & Reed, D. J. 2013. The value of wetlands in protecting southeast Louisiana from hurricane storm surges. PloS one, 8(3), e58715.

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Property
ICON Forest Removal Area
ERM Vegetation Survey
ICON Soil Remediation Area

Notes:
Values shown are total acres proposed by ICON for removal at each location.
ICON Soil Remediation Areas and corresponding Forest Removal Areas based on ICON Figure 43 "Soil Excavation and Amendment Areas.
Imagery Basemap via ArcGIS Online.

Source: Esri - ArcGIS Online; NAD 1983 UTM Zone 15N

Figure E1
Proposed ICON Soil Remediation Vegetation Clearing
Hero Lands Company, L.L.C. vs.
Chevron U.S.A. Inc., et al.
Stella Oil & Gas Field
Plaquemines Parish, Louisiana

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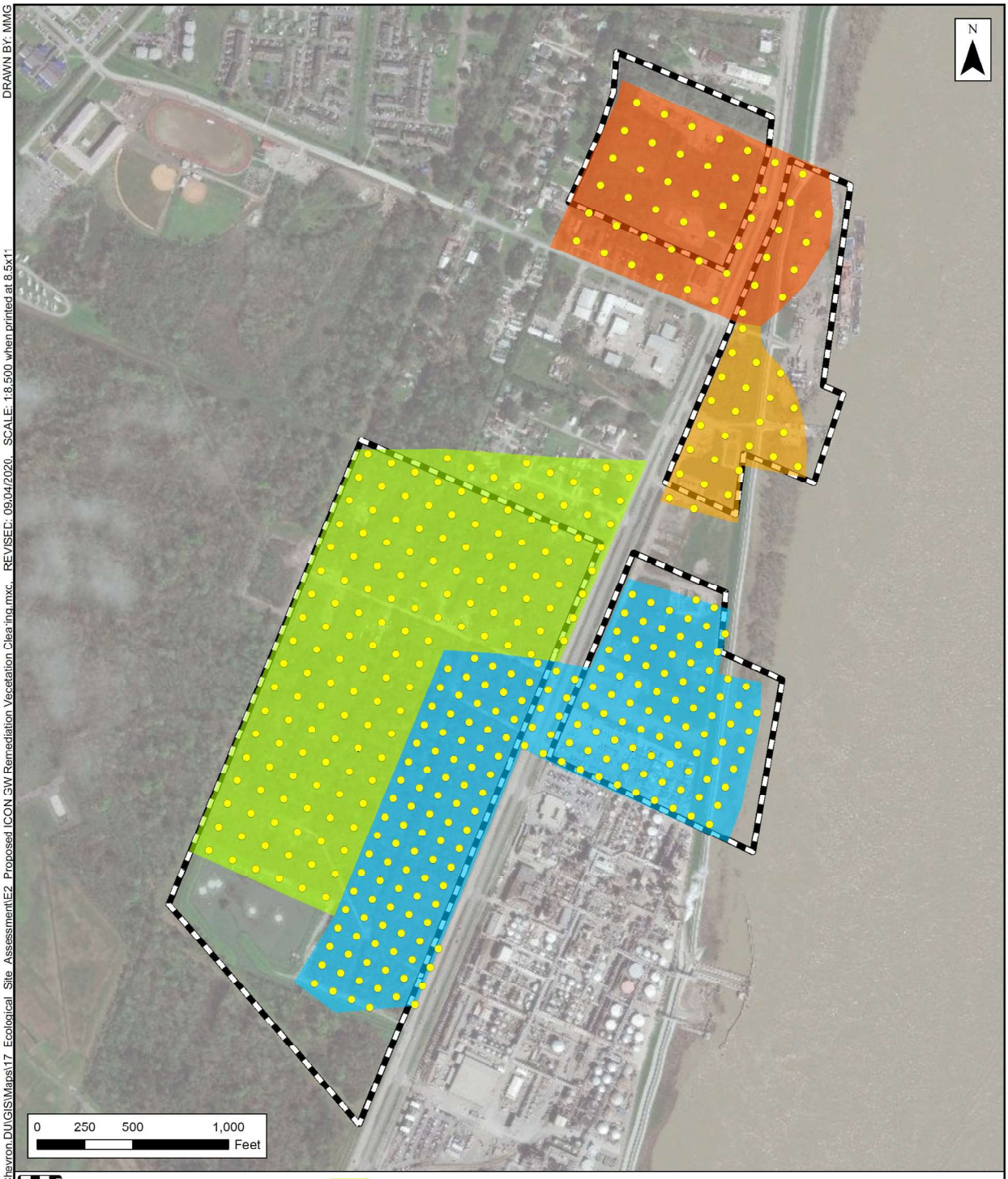

Figure E2
ICON GW Remediation Vegetation Clearing
Hero Lands Company, L.L.C. vs.
Chevron U.S.A. Inc., et al.
Stella Oil and Gas Field
Plaquemines Parish, Louisiana

Environmental Resources Management
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Notes:
The number of recovery wells shown is based on ICON's Expert Report and Restoration Plan.
An estimated 5.1 acres of forest would have to be cleared in order to install the wells proposed by ICON, based on the total workspace area needed to install the wells.
Basemap Imagery via ArcGIS Online.

Source: Esri - ArcGIS Online; NAD 1983 UTM Zone 15N

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