John H. Rodgers, Jr., Ph.D.
102 Santee Trail
Clemson, SC 29631

February 15, 2016

Mr. Andrew Stakelum, Esq.
King & Spalding LLP
1100 Louisiana Street
Suite 4000
Houston, TX 77002

Ms. Carol Wood, Esq.
King & Spalding LLP
1100 Louisiana
Suite 4000
Houston, TX 77002

RE: **VERMILION PARISH SCHOOL BOARD PROPERTY,**
EAST WHITE LAKE OIL AND GAS FIELD,
VERMILION PARISH, LA

Supplemental Report
John H. Rodgers Jr., Ph.D.

Dear Mr. Stakelum and Ms. Wood:

Per your request, this supplemental report updates my prior Ecological Risk Assessment Report submitted September 30th, 2015, in the above referenced case. This supplemental report reflects opinions based on review of newly available remediation reports, updated federal guidance for conducting ERAs, and updated site information.

Sincerely,

John H. Rodgers, Jr.

John H. Rodgers, Jr., Ph.D.

SUPPLEMENTAL REPORT TO:

ECOLOGICAL RISK ASSESSMENT

VERMILION PARISH SCHOOL BOARD PROPERTY, EAST WHITE LAKE OIL AND GAS FIELD, VERMILION PARISH, LA

Report by

John H. Rodgers, Jr., Ph.D.
102 Santee Trail
Clemson, SC 29631
and
Department of Forestry and Environmental Conservation
Ecotoxicology Program
Clemson University
P.O. Box 340317
261 Lehotsky Hall
Clemson, SC 29634-0317

864.653.3990 (H)
864.656.0492 (O)

email: jrodger@clemson.edu

February 15, 2016

Supplemental Report To:

ECOLOGICAL RISK ASSESSMENT

VERMILION PARISH SCHOOL BOARD PROPERTY,
EAST WHITE LAKE OIL AND GAS FIELD,
VERMILION PARISH, LA

1.0 I have updated the conservative Ecological Risk Assessment (ERA) provided on September 30, 2015, in support of UNOCAL's Feasible Plan with recent soil/sediment constituent data collected from the November and December 2015 sampling event. Based on review of the recent data, the original opinions expressed in my original ERA report have not changed.

In October 2015, the USEPA published new guidance *Determination of the Biologically Relevant Sampling Depth for Terrestrial and Aquatic Ecological Risk Assessments*. This guidance stresses the importance of considering samples from the biologically active zone in conducting an ERA. Per the new guidance, the biologically active zone for the VPSB property is 0-15 cm. I therefore updated my ERA to consider data within this zone (Table 1). For consistency, I also considered the recent data using my previous conservative 0-3 ft BGS analysis (Table 2).

Results from the quantitative baseline ERA (BERA) using the most recent soil/sediment data indicate that there are no unacceptable risks to ecological receptors on the VPSB property and that remedial action based on ecological risk is not warranted (Tables 1 and 2; Appendix C). The ERA quantitatively confirms that historical exploration and production activities on this site do not pose an unacceptable risk to wildlife. Therefore no remediation is necessary to remedy any ecological risk. Any significant intrusive remedial action affecting the wetlands on the property would be unnecessary and would jeopardize the important ecosystem services that these fresh to intermediate marshes are providing, which would be contrary to recent federal guidance (Donovan et al., 2015).

Appendices

Appendix A: Soil and Sediment Analysis Summaries (ICON 2016; MP&A 2015)

Appendix B: 95% UCL Calculations Output File: Including Updated Nov-Dec 2015 Data

Appendix C: Baseline Ecological Risk Assessment Calculations Updated with Nov-Dec 2015 Data

Table 1: Summary Results (HQs) from BERA for the EWL property based on 95% UCLs of COPECs in soil/sediments, including recent sampling data (0-1 ft BGS)

Surrogate Avian Species for BERA

COPEC	American Robin	Spotted Sandpiper	Snowy Egret	American Woodcock	Mallard Duck	Great Blue Heron
Arsenic	0.0207319	0.0049979	0.0009433	0.0234369	0.0041235	0.0007410
Barium	0.5610635	0.0154143	0.0242298	0.3251950	0.1411624	0.0190492
Cadmium	0.1072180	0.0038422	0.0048981	0.1281409	0.0047896	0.0038389
Chromium	0.0601118	0.0093042	0.0017020	0.0694188	0.0081158	0.0013398
Lead	0.1988108	0.0215186	0.0039062	0.2276311	0.0215712	0.0030761
Mercury	0.0221252	0.0052494	0.0017255	0.0219848	0.0053912	0.0013527
Selenium	0.1379862	0.0401826	0.0792355	0.1178420	0.0450568	0.0620858
Zinc	0.4728526	0.1504963	0.0414062	0.5522510	0.1114151	0.0324745

Surrogate Mammal Species for BERA

COPEC	Least Shrew	Swamp Rabbit	Red Fox	American Mink
Arsenic	0.0411155	0.0081182	0.0004016	0.0035032
Barium	0.1065349	0.2109171	0.0138767	0.0167463
Cadmium	0.1990472	0.0177122	0.0027276	0.0162051
Chromium	0.0626740	0.0099594	0.0033423	0.0032381
Lead	0.0642885	0.0110919	0.0047179	0.0023231
Mercury	0.0575804	0.0258863	0.0009140	0.0096172
Selenium	0.6308998	0.5019661	0.0263871	0.9038762
Zinc	0.3941916	0.0532723	0.0186161	0.0628122

Table 2: Summary Results (HQs) from BERA for the EWL property based on 95% UCLs of COPECs in soil/sediments, including recent sampling data (0-3 ft BGS)

Surrogate Avian Species for BERA

COPEC	American Robin	Spotted Sandpiper	Snowy Egret	American Woodcock	Mallard Duck	Great Blue Heron
Arsenic	0.0213045	0.0051360	0.0009693	0.0240842	0.0042374	0.0007614
Barium	0.5521448	0.0151693	0.0238447	0.3200257	0.1389184	0.0187464
Cadmium	0.1058195	0.0037921	0.0048342	0.1264695	0.0047271	0.0037889
Chromium	0.0601118	0.0093042	0.0017020	0.0694188	0.0081158	0.0013398
Lead	0.1963288	0.0212500	0.0038574	0.2247894	0.0213019	0.0030377
Mercury	0.0221252	0.0052494	0.0017255	0.0219848	0.0053912	0.0013527
Selenium	0.1379862	0.0401826	0.0792355	0.1178420	0.0450568	0.0620858
Zinc	0.4728526	0.1504963	0.0414062	0.5522510	0.1114151	0.0324745

Surrogate Mammal Species for BERA

COPEC	Least Shrew	Swamp Rabbit	Red Fox	American Mink
Arsenic	0.0422510	0.0083424	0.0004127	0.0036000
Barium	0.1048414	0.2075644	0.0136562	0.0164801
Cadmium	0.1964510	0.0174812	0.0026920	0.0159938
Chromium	0.0626740	0.0099594	0.0033423	0.0032381
Lead	0.0634859	0.0109535	0.0046590	0.0022941
Mercury	0.0575804	0.0258863	0.0009140	0.0096172
Selenium	0.6308998	0.5019661	0.0263871	0.9038762
Zinc	0.3941916	0.0532723	0.0186161	0.0628122

2.0 References Cited

Donovan, S., C. Goldfuss and J.Holdren. 2015. Incorporating ecosystem services into Federal Decision Making. Memorandum for executive departments and agencies. October 7, 2015. M-16-01. 5 pp.

ICON. 2016. Most Feasible Plan for Evaluation/ Remediation. State of Louisiana and Vermilion Parish School Board vs. Louisiana Land Exploration et al.. Docket No. 82162, Div "D"; 15th JDC.

Rodgers, J. H. Jr., 2015. Ecological risk assessment: Vermilion Parish School Board Property, East White Lake Oil and Gas Field, Vermilion Parish, LA. (September 30, 2015).

USEPA. 1997. Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments. EPA-540-R-97-006. 239 pp.

USEPA, 2015. Determination of the Biologically Relevant Sampling Depth for Terrestrial and Aquatic Ecological Risk Assessments. National Center for Environmental Assessment, Ecological Risk Assessment Support Center, Cincinnati, OH. EPA/600/R-15/176. 75 pp.