

## **Appendix L Hypothetical 29-B Plan**

ERM's proposed most feasible plan (MFP) for this site is located in the main body of this document and complies with the Louisiana Department of Environmental Quality's Risk Evaluation/Corrective Action Program (RECAP), the State's risk-based protocol for environmental evaluation and remediation, Statewide Order 29-B (29-B), and LDNR's interpretation of Order 29-B, utilizing recognized exceptions approved and accepted by LDNR in developing remediation plans for exploration and production sites. See Exhibit 1, December 12, 2018, Memorandum from John W. Adams to Richard P. Ieyoub.

As required by LAC 43:XIX.611.F.1, this Appendix presents a hypothetical remediation plan for groundwater that complies with all the provisions of Order 29-B, exclusive of Subchapter 319, and is submitted solely in fulfillment of that requirement. Unlike its soil standards, 29-B contains no groundwater standards. Therefore, this Hypothetical 29-B Plan includes a cost estimate to attempt to remediate groundwater only at the SNG Areas of Interest (Areas 1 and 3). ERM's MFP for soil remediation does not include exceptions to 29-B and would not be modified for this Hypothetical 29-B Plan. Salt parameters in soil are agronomic standards under 29-B and therefore only apply to the effective root zone (See July 19, 2000 LDNR Decision on MAR Services Site Remediation [Exhibit 2]) and sampling results for other constituents in soils at Areas 1 and 3 do not exhibit exceedances of 29-B pit closure standards.

The implementation of this Hypothetical 29-B Plan would be excessive, wasteful, unnecessary, technically impracticable, infeasible, potentially harmful, economically unsound, unreasonable, and would result in significantly more damage than benefit. This Hypothetical 29-B Plan is therefore a hypothetical plan, which would be impractical or impossible to implement. Therefore, ERM does not support or endorse the adoption of this plan as the most feasible plan for this site for the following reasons:

- It is unnecessary given the current condition of the Property, which meets RECAP and USEPA human health and ecological standards and continues to be used for its highest and best use;
- It is technically impracticable because it would result in significantly more damage than benefit to the environment and public health;
- It would necessarily disrupt current and future agricultural activities on the Property;
- It would ignore LDNR's approval of risk-based standards in the 2011 LDNR/LDEQ Memorandum of Understanding (MOU) and in multiple MFPs including 29-B exceptions issued to reviewing courts based on evidence presented at Act 312 hearings (see Exhibit 1); and,
- It is not the most feasible plan to protect the health, safety and welfare of the people of Louisiana.

ERM's MFP includes the application of appropriate and recognized exceptions allowed under Section 319 of the 29-B regulations and the 2011 MOU to support the application of RECAP. ERM requests that the RECAP-based plan be adopted as the most feasible plan for this Property. The use of RECAP to determine whether and to what extent groundwater should be remediated has consistently been recognized by LDNR as an appropriate exception to 29-B. In addition to general guidance from both LDNR and LDEQ on the application of RECAP to groundwater, previous and current regulation by LDEQ of groundwater underlying adjacent properties clearly support the use of RECAP. Therefore, the application of RECAP to the groundwater in this case is appropriate for the following reasons:

- The 2003 RECAP document provides the comprehensive risk-based program necessary for fully evaluating this complex, multi-media site. The US EPA, Louisiana, and other state risk-based standards have been developed and refined after Order 29-B; therefore, they provide standards that appropriately supplement 29-B standards. and
- The February 2011 Memorandum of Understanding (MOU) between the LDNR and the LDEQ recognizes the application of RECAP, a risk-based approach to assessing the need for remediation as compared to the rigid 1986 Statewide Order 29-B pit closure standards, which are not risk-based and do not include numeric groundwater standards. Furthermore, the MOU states that all site evaluation, remediation plans, or final results submitted pursuant to RECAP Management Option 3 (MO-3) assessments, or addressing air, surface water, water bottoms (sediments), or non-29-B parameters shall be forwarded to LDEQ for review and comment.

This Hypothetical 29-B Plan is not appropriate and should be rejected because, as identified in the US National Contingency Plan (NCP), the ultimate selection of a remedy by the agency is dependent upon five primary balancing criteria including (1) long-term effectiveness and permanence; (2) reduction of toxicity, mobility, or volume through treatment, (3) short-term effectiveness, (4) implementability, and (5) cost. Rigid application of Order 29-B (i.e., implementation of this Hypothetical 29-B Plan), is not consistent with these criteria. If two remedies are equally feasible, reliable, and provide the same level of protection, then the least expensive remedy should be selected. Both the capital and long-term operational and maintenance costs for the remedial period must be considered. The most expensive remedy is not always the most feasible or best approach.

This Hypothetical 29-B Plan should be rejected for the following additional reasons.

- The SNG E&P development on the property occurred well before the introduction of modern environmental regulations, including the Order 29-B pit closure rules promulgated in 1986, before modern well plugging and abandonment procedures, etc. Therefore, strict application of Order 29-B, as opposed to Louisiana's risk-based RECAP standards, is not reasonable.
- The shallow water bearing zone that starts at a depth of between approximately 10 and 25 feet below the ground surface is a Class 3 aquifer. This zone has a very low hydraulic conductivity (average of 1.8 feet per day) and consequently a very low yield (136 gallons per day). The low hydraulic conductivity in this zone demonstrates not only that it is unsuited as a source of usable water, but also that it would be infeasible to treat through a long-term, large scale pumping remedy.
- The shallow water bearing zone is highly variable laterally, which would further impede the ability to recover groundwater in some areas on the site. This is demonstrated by the very low yield in wells MW-8 (purged dry during sampling) and MW-6 (slug test results indicate well yield of 45 gpd) within Area 3.
- The shallow water bearing zone has naturally poor water quality, with iron and manganese concentrations greatly exceeding the EPA Secondary Maximum Contaminant Levels (SMCLs). An attempt to reduce constituents to background levels will likely not achieve any benefit; further, the remedy would not make the water desirable to drink because iron and manganese would naturally remain above SMCLs, and arsenic would naturally remain above the EPA Maximum Contaminant Level (MCL).
- The deeper Class 2 water bearing zone underlying the Property occurs at depths below approximately 50 feet below ground surface. This water bearing zone has not historically

been utilized as a source of drinking water or other purposes at the Property, and shows no evidence of impacts.

- The only Class 1 aquifer, the Atchafalaya Aquifer, underlying the property occurs at depths below approximately 160 to 200 feet, and has historically been utilized as a source of water for rig supply, domestic, and other purposes in water wells within a one-mile radius of the property. However, the City of Franklin currently sources its municipal water supply from the surface water of Bayou Teche due to the naturally salty water in the Atchafalaya Aquifer.
- A remedy of the magnitude required to attempt to fully comply with Order 29-B is technically impracticable (not able to achieve end goals in a reasonable time frame), particularly for groundwater.
- Implementation of this Hypothetical 29-B Plan would destroy portions a healthy sugar cane farming operation and a thriving ecosystem in the effort to attain groundwater concentrations that would provide no environmental benefit.
- The implementation of this Hypothetical 29-B Plan would do nothing to change the current or reasonably anticipated future use of the property and would, in fact, impede operations for the duration of the remedy.
- The risks posed by implementation of a massive Hypothetical 29-B Plan are significant and must be considered. They include destruction of healthy agricultural and wetland areas as a result of installation and operation of a groundwater remediation system, and potential for subsidence due to the extraction of large volumes of shallow groundwater.
- Pits closed prior to January 20, 1986, are not considered existing pits subject to Order 29-B standards. Thus, implementation of this Hypothetical 29-B Plan is not appropriate.
- Approximately 60 years of E&P activities (from 1940 to 2000) consisting of drilling and operating many oil wells, drilling and operating salt water disposal wells (SWDs), and the construction and use of pits, pipelines, tanks, etc., were authorized by the lessor to extract the maximum amount of oil and gas from the property at issue. Although these long-term industrial operations, as expected, have left an industrial footprint on the property, that footprint has not affected the past, current or reasonably anticipated future highest and best use of the Property, and does not pose an unacceptable risk to human health or the environment.

For these reasons, ERM does not support the implementation of this Hypothetical 29-B Plan. ERM recommends the adoption of its proposed remediation plan that applies RECAP (as provided for in the 2011 Memorandum of Understanding between LDNR and LDEQ).

The Hypothetical 29-B Plan is based on the following scope and general assumptions.

- 29-B salt parameters in soil are agronomic standards and therefore only apply to the effective root zone, which is approximately 12-14 inches on the Property per Dr. Luther Holloway's evaluation. Because farmers are deep chisel-plowing to remove hard pans in their fields, it is assumed that the remediation zone for 29-B salt parameters is up to 24 inches below ground surface. See Exhibit 2.
- Sampling results indicate that soils within Areas 1 and 3 do not exhibit exceedances of Order 29-B pit closure standards; therefore, remediation of soils is not necessary in these areas.

- Evaluation and remediation to address groundwater where concentrations indicate any increase in concentrations over background (which has not been established for the property). This is based on the assumption that Statewide Order 29-B requires that groundwater be remediated to background conditions, regardless of risk or lack of risk posed by the conditions, which is contrary to modern EPA and state risk-based regulations and guidance.
- Target groundwater chloride concentrations are based on an estimated background chloride concentration of approximately 25 mg/L based on monitoring wells on the site that were identified as background. This estimated background concentration is 10 times lower than the EPA SMCL of 250 mg/L and is therefore an unreasonable target concentration. This Hypothetical 29-B Plan has been evaluated with target chloride concentrations of both 25 mg/L (estimated background) and 250 mg/L (EPA SMCL). The extent of these remediation areas were estimated based on extrapolated data and/or former operational areas and are shown on Figure L-1.
- This Hypothetical 29-B Plan for groundwater relies on an estimated capture zone for each recovery well based on *U.S. EPA., 1987, Guidelines for delineation of wellhead protection area, EPA 440/6-87-010, Washington, D.C., Office of Groundwater Protection*, along with various other assumptions outlined in Tables L-1 through L-3. These assumptions would be further evaluated after the *Initial Remediation Well Installation, Pump Test, and Pilot Evaluation* component of the remedy. It is anticipated that this initial step in the remedy would demonstrate that the implementation of the full Hypothetical 29-B Plan would be impractical or impossible.

The following steps would be implemented as part of this Hypothetical 29-B Plan:

- Submit a plan to LDNR Office of Conservation for assessment and design activities;
- Apply for Coastal Use Permit and U.S. Army Corps of Engineers Wetlands Permit for assessment and remediation activities;
- Perform *Initial Remediation Well Installation, Pump Test, and Pilot Evaluation* to obtain data needed to design a groundwater pumping system, if practical and possible;
- Perform design activities for groundwater pumping;
- Submit a detailed implementation plan to LDNR OOC for remediation activities;
- Revise, if necessary, the Coastal Use Permit and U.S. Army Corps of Engineers Wetlands Permit applications;
- Install saltwater disposal well for on-site disposal of extracted groundwater;
- Install groundwater extraction wells; and,
- Install groundwater recovery system and operate for a period of up to 30 years.

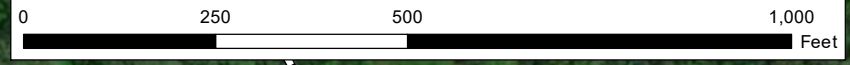
It has been assumed that the groundwater pumping remedy will continue for a period of 30 years. Although estimates based on the currently available data suggest that the remedy may extend beyond 30 years for some scenarios, the time frame cannot be determined until pump tests and pilot testing is complete. The 30-year-time frame is consistent with EPA guidance on estimating the costs for groundwater pump and treat remedies. Similarly, the number of recovery wells needed to implement the groundwater pumping remedy cannot be determined until pump tests and pilot testing is completed. The cost estimates assume the number of recovery wells based on estimated capture zones calculated from EPA wellhead protection equations and the total estimated impacted area. In reality, the ability to implement groundwater pumping from numerous wells would likely be impeded by the limited ability to install and operate recovery wells within wetland areas and pipeline right-of-ways, recovery wells pumping dry over time due to close spacing, and very low yield in some portions of the highly variable and discontinuous shallow water-bearing zone.

In addition, the groundwater remediation area in Area 1 is located within the current sugar cane farming operation. The remedy will cause the disruption, or complete shutdown, of agricultural activities in this area. The costs of this business interruption will be significant and have not been included in the estimate.

The details of this plan and estimated implementation cost are included in Tables L-1, L-2 and L-3.

The hypothetical schedule for implementing this Hypothetical 29-B Plan would be generally as follows:

- Submit a Coastal Use Permit (CUP) application – approximately 60 days after adoption of this Hypothetical 29-B Plan;
- Receipt of the CUP would require at least 3 to 6 months, if it was possible to obtain LDNR Office of Coastal Management and U.S. Army Corps of Engineers approval;
- Assessment activities (groundwater assessment) would require approximately 6 months to complete;
- Groundwater treatment system design and installation would require approximately 6 months to complete; and,
- The groundwater extraction and disposal would be performed for up to 30 years.



- ERM Monitoring Well Location
  - ICON Monitoring Well Location
  - Sampling Areas
  - Approximate Former Pit Boundary in SNG Areas
  - Estimated Chloride Concentration Contour
  - Property Boundary
- SNG Wells**
- SN64701 - P&A Oil Producer
  - SN114167 - P&A Gas & Condensate Producer
- | Sample ID | Screened Interval | Constituent: MP&A or ERM result/ICON result |
|-----------|-------------------|---|
| MW-6      | Screen: 14-24'    | Cl: 494/428                                 |
| MW-7      | Screen: 14-24'    | Cl: 577/504                                 |
| MW-8      | Screen: 15-20'    | Cl: 335/322                                 |
| EN-13     | Screen: 12-22'    | Cl: 5,330/4,640                             |
| EN-18     | Screen: 18-23'    | Cl: 48.6/40.8                               |

**Figure L-1**  
**Hypothetical 29-B Groundwater Remediation Areas**  
 Louisiana Wetlands, LLC and New 90, LLC vs  
 Energen Resources Corporation, et al.  
 Franklin Oil & Gas Field  
 St. Mary Parish, Louisiana

Notes:  
 Concentrations reported as mg/L.  
 NA - Not analyzed.  
**Bold** values exceed the EPA SMCL.  
 Chloride concentration contour in Area 1 based on former pit boundary.  
 Chloride concentration contours in Area 3 are estimated based on available data.  
 Imagery basemap via ArcGIS Online.

**Table L-1**  
**Groundwater Remediation: Area 1 - Target Chloride 25 mg/L (Hypothetical 29-B Plan)**

*Louisiana Wetlands, LLC v. Energen Resources Corporation et al.*  
*Franklin Oil and Gas Field*  
*St. Mary Parish, Louisiana*

<u>Volume Calculations</u>	<u>Unit</u>	<u>Value</u>	<u>Basis</u>
Impacted Thickness (b)	feet	3	Aquifer thickness at EN-18
Porosity (n)	unitless	0.3	Assumed
Area of Plume (A)	square feet	15,564	Approximate area of former pit
Pore Volume	cubic feet	14,008	Calculated: Pore Volume = b * n * A
Pore Volume	gal	104,784	Calculated: Unit conversion
Retardation Factor (Rf)	unitless	1	Constant value for chloride
Target Concentration (C <sub>f</sub> )	mg/L	25	Estimate - background samples less than ~25 mg/L
Initial Concentration (C <sub>o</sub> )	mg/L	44.7	Average of ICON and ERM Splits at EN-18
Number Pore Volumes	unitless	0.58	Calculated: Number Pore Volumes = -Rf * ln(C <sub>f</sub> /C <sub>o</sub> )
Recovery Volume	gallons	60,890	Calculated: Recovery Volume = Pore Volume * Number Pore Volumes
<u>Recovery Well Calculations</u>			
Aquifer Pumping Rate	gallons per minute	0.0942	Average well yield on the property based on slug test results
Aquifer Pumping Rate (Q)	ft <sup>3</sup> /day	18.13	Calculated: Unit conversion
Time (t)	days	730	Assume 2 years
Estimated Radius (r)	feet	68	Calculated: $r = \sqrt{\frac{Qt}{\pi bn}}$ (EPA, 1987)
Estimated Capture Zone Area	square feet	14,708	Calculated
Estimated Number of Recovery Wells	unitless	1	Calculated: Area of Plume / Estimated Capture Zone Area
<u>Time Calculations</u>			
Groundwater Recovery Rate	gallons per day	136	Calculated: Pumping Rate * Number of Wells
Recovery System Operation Time	years	1.2	Calculated: Recovery Volume / Recovery Rate
<u>Other Assumptions</u>			
Well Depth	feet	23	Approximate bottom of shallow water-bearing zone at EN-18
Well Diameter	inch	4	Assumed

Initial RW Installation, Pump Test, and Pilot Evaluation

	<u>Unit Cost</u>	<u>Units</u>	<u>Quantity</u>	<u>Cost</u>	<u>Cost Basis</u>
Drill Rig Mobilization/Demobilization	\$780	unit	1	\$780	08/26/2020 Walker Hill Estimate
Hollow Stem Auger Rig and Crew (one four-inch well and one two-inch well)	\$2,500	day	2	\$5,000	08/26/2020 Walker Hill Estimate
Four-inch PVC Well Materials	\$18	foot	23	\$414	08/26/2020 Walker Hill Estimate
Two-inch PVC Well Materials	\$15	foot	23	\$345	08/26/2020 Walker Hill Estimate
Drill Crew Per Diem	\$375	day	2	\$750	08/26/2020 Walker Hill Estimate
Above-grade Surface Completions	\$600	unit	2	\$1,200	08/26/2020 Walker Hill Estimate
1/2 HP 5 GPM Well Pump, Motor, and Control Box	\$2,000	unit	1	\$2,000	ERM Estimate
Solar Panel, Batteries, and Installation	\$20,000	unit	1	\$20,000	ERM Estimate, <a href="https://www.solarreviews.com/solar-panel-cost">https://www.solarreviews.com/solar-panel-cost</a>
ERM Oversight, Development, and Equipment	\$1,500	day	2	\$3,000	ERM Estimate
ERM Labor for 24-Hour Pump Test	\$3,750	day	1	\$3,750	ERM Estimate
Data Loggers for Pump Test	\$2,000	unit	2	\$4,000	ERM Estimate
Frac Tank for Pump Test	\$50	day	30	\$1,500	ERM Estimate
Data Evaluation and Reporting	\$7,500	unit	1	\$7,500	ERM Estimate
<i>Initial RW Installation, Pump Test, and Pilot Evaluation Subtotal</i>				<u>\$50,239</u>	

**Table L-1**  
**Groundwater Remediation: Area 1 - Target Chloride 25 mg/L (Hypothetical 29-B Plan)**

*Louisiana Wetlands, LLC v. Energen Resources Corporation et al.*  
*Franklin Oil and Gas Field*  
*St. Mary Parish, Louisiana*

<u>On-site Disposal Capital Costs</u>	<u>Unit Cost</u>	<u>Units</u>	<u>Quantity</u>		<u>Cost</u>	<u>Cost Basis</u>
Disposal Wells	\$1,000,000	unit	0		\$0	Assume disposal well installed in Area 3
10,000 Gallon Storage Tanks	\$10,000	unit	1		\$10,000	ERM Estimate, Peak Energy
Pumps, Piping, and Electrical	\$30,000	unit	1		\$30,000	ERM Estimate, Peak Energy
Vac Truck	\$75	hour	120		\$9,000	ERM Estimate, assume 8 hours per month
<i>On-site Disposal Capital Costs Subtotal</i>					<i>\$49,000</i>	
<u>Recovery Operation and Maintenance</u>	<u>Unit Cost</u>	<u>Units</u>	<u>Quantity</u>	<u>Quarterly or Annual</u>	<u>Cost</u>	<u>Cost Basis</u>
Energy Consumption (Recovery Pumps)	\$0.1012	kWh	806	5	\$408	ERM Estimate, <a href="https://www.electricitylocal.com/">https://www.electricitylocal.com/</a>
Personnel (O&M)	\$75	hr	26	5	\$9,750	ERM Estimate - Assumes additional 2 hours per week
Project Management	\$120	hr	10	5	\$6,000	ERM Estimate - Assumes 10 additional hours per quarter
Miscellaneous Equipment	\$2,000	year	1	1	\$2,000	ERM Estimate
Pump Replacement	\$2,000	year	0	1	\$0	ERM Estimate - Assumes no pump replacement
Annual Sampling	\$500	year	1	1	\$500	ERM Estimate - Assume sampling in conjunction with Area 3
<i>Recovery Operation and Maintenance Subtotal</i>					<i>\$18,658</i>	
<u>Project Management and Reporting</u>	<u>Unit Cost</u>	<u>Units</u>	<u>Quantity</u>	<u>Years</u>	<u>Cost</u>	<u>Cost Basis</u>
Project Management	\$2,500	year	1	1	\$2,500	ERM Estimate
Data Evaluation and Reporting	\$5,000	year	1	1	\$5,000	ERM Estimate
<i>Project Management and Reporting Subtotal</i>					<i>\$7,500</i>	
<b>Total Cost - 1.25 Years of Operation</b>					<b>\$125,397</b>	



**Table L-2**  
**Groundwater Remediation: Area 3 - Target Chloride 25 mg/L (Hypothetical 29-B Plan)**

*Louisiana Wetlands, LLC v. Energen Resources Corporation et al.*  
*Franklin Oil and Gas Field*  
*St. Mary Parish, Louisiana*

<u>Volume Calculations</u>	<u>Unit</u>	<u>Value</u>	<u>Basis</u>
Impacted Thickness (b)	feet	8.2	Average aquifer thickness in Area 3
Porosity (n)	unitless	0.3	Assumed
Area of Plume (A)	square feet	686,200	Area of extrapolated (estimated) 25 mg/L contour
Pore Volume	cubic feet	1,688,052	Calculated: Pore Volume = b * n * A
Pore Volume	gal	12,627,507	Calculated: Unit conversion
Retardation Factor (Rf)	unitless	1	Constant value for chloride
Target Concentration (C <sub>f</sub> )	mg/L	25	Estimate - background samples less than ~25 mg/L
Initial Concentration (C <sub>o</sub> )	mg/L	1579	Average of ICON and ERM Splits for wells in Area 3
Number Pore Volumes	unitless	4.15	Calculated: Number Pore Volumes = -Rf * ln(C <sub>f</sub> /C <sub>o</sub> )
Recovery Volume	gallons	52,347,491	Calculated: Recovery Volume = Pore Volume * Number Pore Volumes
<u>Recovery Well Calculations</u>			
Aquifer Pumping Rate	gallons per minute	0.14	Average well yield of MW-6 and MW-7 based on slug test results
Aquifer Pumping Rate (Q)	ft <sup>3</sup> /day	26.95	Calculated: Unit conversion
Time (t)	days	3,650	Assume 10 years
Estimated Radius (r)	feet	113	Calculated: $r = \sqrt{\frac{Qt}{\pi bn}}$ (EPA, 1987)
Estimated Capture Zone Area	square feet	39,987	Calculated
Estimated Number of Recovery Wells	unitless	17	Calculated: Area of Plume / Estimated Capture Zone Area
<u>Time Calculations</u>			
Groundwater Recovery Rate	gallons per day	3,427	Calculated: Pumping Rate * Number of Wells
Recovery System Operation Time	years	30	Assume 30 years based on EPA (calculated value [Recovery Volume / Recovery Rate] is ~42 years)
<u>Other Assumptions</u>			
Well Depth	feet	22	Approximate bottom of shallow water-bearing zone in Area 3
Well Diameter	inch	4	Assumed

Initial RW Installation, Pump Test, and Pilot Evaluation

	<u>Unit Cost</u>	<u>Units</u>	<u>Quantity</u>	<u>Cost</u>	<u>Cost Basis</u>
Coastal Use Permit Application	\$5,000	unit	1	\$5,000	ERM Estimate
Drill Rig Mobilization/Demobilization	\$780	unit	1	\$780	08/26/2020 Walker Hill Estimate
Hollow Stem Auger Rig and Crew (one four-inch well and one two-inch well)	\$2,500	day	2	\$5,000	08/26/2020 Walker Hill Estimate
Four-inch PVC Well Materials	\$18	foot	22	\$396	08/26/2020 Walker Hill Estimate
Two-inch PVC Well Materials	\$15	foot	22	\$330	08/26/2020 Walker Hill Estimate
Drill Crew Per Diem	\$375	day	2	\$750	08/26/2020 Walker Hill Estimate
Above-grade Surface Completions	\$600	unit	2	\$1,200	08/26/2020 Walker Hill Estimate
1/2 HP 5 GPM Well Pump, Motor, and Control Box	\$2,000	unit	1	\$2,000	ERM Estimate
Temporary Electrical Hookup	\$40	feet	1,200	\$48,000	ERM Estimate
ERM Oversight, Development, and Equipment	\$1,500	day	2	\$3,000	ERM Estimate
ERM Labor for 24-Hour Pump Test	\$3,750	day	1	\$3,750	ERM Estimate
Data Loggers for Pump Test	\$2,000	unit	2	\$4,000	ERM Estimate
Frac Tank for Pump Test	\$50	day	30	\$1,500	ERM Estimate
Data Evaluation and Reporting	\$7,500	unit	1	\$7,500	ERM Estimate
<i>Initial RW Installation, Pump Test, and Pilot Evaluation Subtotal</i>				<u>\$83,206</u>	

**Table L-2**  
**Groundwater Remediation: Area 3 - Target Chloride 25 mg/L (Hypothetical 29-B Plan)**

*Louisiana Wetlands, LLC v. Energen Resources Corporation et al.*  
*Franklin Oil and Gas Field*  
*St. Mary Parish, Louisiana*

<u>Additional RW Installation</u>	<u>Unit Cost</u>	<u>Units</u>	<u>Quantity</u>		<u>Cost</u>	<u>Cost Basis</u>
Drill Rig Mobilization/Demobilization	\$780	unit	1		\$780	08/26/2020 Walker Hill Estimate
Hollow Stem Auger Rig and Crew (sixteen four-inch wells)	\$2,500	day	10		\$25,000	08/26/2020 Walker Hill Estimate
Four-inch PVC Well Materials	\$18	foot	352		\$6,336	08/26/2020 Walker Hill Estimate
Drill Crew Per Diem	\$375	day	10		\$3,750	08/26/2020 Walker Hill Estimate
Above-grade Surface Completions	\$600	unit	16		\$9,600	08/26/2020 Walker Hill Estimate
1/2 HP 5 GPM Well Pump, Motor, and Control Box	\$2,000	unit	16		\$32,000	ERM Estimate
Electrical Hookup	\$40	feet	4,000		\$160,000	ERM Estimate
ERM Oversight, Development, and Equipment	\$1,500	day	10		\$15,000	ERM Estimate
<i>Additional RW Installation Subtotal</i>					<i>\$252,466</i>	
<u>On-site Disposal Capital Costs</u>	<u>Unit Cost</u>	<u>Units</u>	<u>Quantity</u>		<u>Cost</u>	<u>Cost Basis</u>
Disposal Well	\$1,000,000	unit	1		\$1,000,000	ERM Estimate, Peak Energy
Three-inch Flowline at 4,700 Linear Feet to Connect to SWD	\$30	feet	4,700		\$141,000	ERM Estimate, Peak Energy (assume 6 wells at 450', 6 wells at 250', and 5 wells at 100' from disposal well)
Right-of-way Crossing for Distribution Lines	\$20,000	unit	1		\$20,000	ERM Estimate
10,000 Gallon Storage Tanks	\$10,000	unit	2		\$20,000	ERM Estimate, Peak Energy
Pumps, Piping, and Electrical	\$100,000	unit	1		\$100,000	ERM Estimate, Peak Energy
<i>On-site Disposal Capital Costs Subtotal</i>					<i>\$1,281,000</i>	
<u>Recovery Operation and Maintenance</u>	<u>Unit Cost</u>	<u>Units</u>	<u>Quantity</u>	<u>Quarterly or Annual</u>	<u>Cost</u>	<u>Cost Basis</u>
Energy Consumption (Recovery Pumps)	\$0.1012	kWh	13,697	120	\$166,331	<a href="https://www.electricitylocal.com/">https://www.electricitylocal.com/</a>
Personnel (O&M)	\$75	hr	130	120	\$1,170,000	ERM Estimate - Assumes 10 hours per week
Project Management	\$120	hr	20	120	\$288,000	ERM Estimate - Assumes 20 hours per quarter
Miscellaneous Equipment	\$2,000	year	1	30	\$60,000	ERM Estimate
Pump Replacement	\$8,000	year	1	30	\$240,000	ERM Estimate - Assumes replacing 4 pumps per year
Annual Sampling	\$15,000	year	1	30	\$450,000	ERM Estimate
<i>Recovery Operation and Maintenance Subtotal</i>					<i>\$2,374,331</i>	
<u>Project Management and Reporting</u>	<u>Unit Cost</u>	<u>Units</u>	<u>Quantity</u>	<u>Years</u>	<u>Cost</u>	<u>Cost Basis</u>
Project Management	\$5,000	year	1	30	\$150,000	ERM Estimate
Data Evaluation and Reporting	\$15,000	year	1	30	\$450,000	ERM Estimate
<i>Project Management and Reporting Subtotal</i>					<i>\$600,000</i>	
<u>On-site Disposal Operation and Maintenance (Annual)</u>	<u>Unit Cost</u>	<u>Units</u>	<u>Quantity</u>	<u>Years</u>	<u>Cost</u>	<u>Cost Basis</u>
Chemical Treatment (Biocide)	\$10,000	year	1	30	\$300,000	ERM Estimate, Peak Energy
Acid Wash SWD (\$100,000 every two years)	\$50,000	year	1	30	\$1,500,000	ERM Estimate, Peak Energy
<i>On-site Disposal Operation and Maintenance (Annual) Subtotal</i>					<i>\$1,800,000</i>	Includes 10% markup on contracted items
<b>Total Cost - 30 Years of Operation</b>					<b>\$6,138,537</b>	

**Table L-3**  
**Groundwater Remediation: Area 3 - Target Chloride 250 mg/L (Hypothetical 29-B Plan)**

*Louisiana Wetlands, LLC v. Energen Resources Corporation et al.*  
*Franklin Oil and Gas Field*  
*St. Mary Parish, Louisiana*

<u>Volume Calculations</u>	<u>Unit</u>	<u>Value</u>	<u>Basis</u>
Impacted Thickness (b)	feet	8.2	Average aquifer thickness in Area 3
Porosity (n)	unitless	0.3	Assumed
Area of Plume (A)	square feet	423,595	Area of extrapolated (estimated) 250 mg/L contour
Pore Volume	cubic feet	1,042,044	Calculated: Pore Volume = b * n * A
Pore Volume	gal	7,795,029	Calculated: Unit conversion
Retardation Factor (Rf)	unitless	1	Constant value for chloride
Target Concentration (C <sub>f</sub> )	mg/L	250	Estimate - background samples less than ~25 mg/L
Initial Concentration (C <sub>o</sub> )	mg/L	1579	Average of ICON and ERM Splits for wells in Area 3
Number Pore Volumes	unitless	1.84	Calculated: Number Pore Volumes = -Rf * ln(C <sub>f</sub> /C <sub>o</sub> )
Recovery Volume	gallons	14,365,675	Calculated: Recovery Volume = Pore Volume * Number Pore Volumes
<u>Recovery Well Calculations</u>			
Aquifer Pumping Rate	gallons per minute	0.14	Average well yield of MW-6 and MW-7 based on slug test results
Aquifer Pumping Rate (Q)	ft <sup>3</sup> /day	26.95	Calculated: Unit conversion
Time (t)	days	3,650	Assume 10 years
Estimated Radius (r)	feet	113	Calculated: $r = \sqrt{\frac{Qt}{\pi bn}}$ (EPA, 1987)
Estimated Capture Zone Area	square feet	39,987	Calculated
Estimated Number of Recovery Wells	unitless	11	Calculated: Area of Plume / Estimated Capture Zone Area
<u>Time Calculations</u>			
Groundwater Recovery Rate	gallons per day	2,218	Calculated: Pumping Rate * Number of Wells
Recovery System Operation Time	years	17.7	Calculated: Recovery Volume / Recovery Rate
<u>Other Assumptions</u>			
Well Depth	feet	22	Approximate bottom of shallow water-bearing zone in Area 3
Well Diameter	inch	4	Assumed

Initial RW Installation, Pump Test, and Pilot Evaluation

	<u>Unit Cost</u>	<u>Units</u>	<u>Quantity</u>	<u>Cost</u>	<u>Cost Basis</u>
Coastal Use Permit Application	\$5,000	unit	1	\$5,000	ERM Estimate
Drill Rig Mobilization/Demobilization	\$780	unit	1	\$780	08/26/2020 Walker Hill Estimate
Hollow Stem Auger Rig and Crew (one four-inch well and one two-inch well)	\$2,500	day	2	\$5,000	08/26/2020 Walker Hill Estimate
Four-inch PVC Well Materials	\$18	foot	22	\$396	08/26/2020 Walker Hill Estimate
Two-inch PVC Well Materials	\$15	foot	22	\$330	08/26/2020 Walker Hill Estimate
Drill Crew Per Diem	\$375	day	2	\$750	08/26/2020 Walker Hill Estimate
Above-grade Surface Completions	\$600	unit	2	\$1,200	08/26/2020 Walker Hill Estimate
1/2 HP 5 GPM Well Pump, Motor, and Control Box	\$2,000	unit	1	\$2,000	ERM Estimate
Temporary Electrical Hookup	\$40	feet	1,200	\$48,000	ERM Estimate
ERM Oversight, Development, and Equipment	\$1,500	day	2	\$3,000	ERM Estimate
ERM Labor for 24-Hour Pump Test	\$3,750	day	1	\$3,750	ERM Estimate
Data Loggers for Pump Test	\$2,000	unit	2	\$4,000	ERM Estimate
Frac Tank for Pump Test	\$50	day	30	\$1,500	ERM Estimate
Data Evaluation and Reporting	\$7,500	unit	1	\$7,500	ERM Estimate
<i>Initial RW Installation, Pump Test, and Pilot Evaluation Subtotal</i>				<u>\$83,206</u>	

**Table L-3  
Groundwater Remediation: Area 3 - Target Chloride 250 mg/L (Hypothetical 29-B Plan)**

*Louisiana Wetlands, LLC v. Energen Resources Corporation et al.  
Franklin Oil and Gas Field  
St. Mary Parish, Louisiana*

<u>Additional RW Installation</u>	<u>Unit Cost</u>	<u>Units</u>	<u>Quantity</u>		<u>Cost</u>	<u>Cost Basis</u>
Drill Rig Mobilization/Demobilization	\$780	unit	1		\$780	08/26/2020 Walker Hill Estimate
Hollow Stem Auger Rig and Crew (ten four-inch wells)	\$2,500	day	7		\$17,500	08/26/2020 Walker Hill Estimate
Four-inch PVC Well Materials	\$18	foot	220		\$3,960	08/26/2020 Walker Hill Estimate
Drill Crew Per Diem	\$375	day	7		\$2,625	08/26/2020 Walker Hill Estimate
Above-grade Surface Completions	\$600	unit	10		\$6,000	08/26/2020 Walker Hill Estimate
1/2 HP 5 GPM Well Pump, Motor, and Control Box	\$2,000	unit	10		\$20,000	ERM Estimate
Electrical Hookup	\$40	feet	2,500		\$100,000	ERM Estimate
ERM Oversight, Development, and Equipment	\$1,500	day	7		\$10,500	ERM Estimate
<i>Additional RW Installation Subtotal</i>					<i>\$161,365</i>	
<u>On-site Disposal Capital Costs</u>	<u>Unit Cost</u>	<u>Units</u>	<u>Quantity</u>		<u>Cost</u>	<u>Cost Basis</u>
Disposal Well	\$1,000,000	unit	1		\$1,000,000	ERM Estimate, Peak Energy
Three-inch Flowline at 2,500 Linear Feet to Connect to SWD	\$30	feet	2,500		\$75,000	ERM Estimate, Peak Energy (assume 4 wells at 350', 4 wells at 200', and 3 wells at 100' from disposal well)
Right-of-way Crossing for Distribution Lines	\$20,000	unit	1		\$20,000	ERM Estimate
10,000 Gallon Storage Tanks	\$10,000	unit	2		\$20,000	ERM Estimate, Peak Energy
Pumps, Piping, and Electrical	\$100,000	unit	1		\$100,000	ERM Estimate, Peak Energy
<i>On-site Disposal Capital Costs Subtotal</i>					<i>\$1,215,000</i>	
<u>Recovery Operation and Maintenance</u>	<u>Unit Cost</u>	<u>Units</u>	<u>Quantity</u>	<u>Quarterly or Annual</u>	<u>Cost</u>	<u>Cost Basis</u>
Energy Consumption (Recovery Pumps)	\$0.1012	kWh	8,862	72	\$64,576	<a href="https://www.electricitylocal.com/">https://www.electricitylocal.com/</a>
Personnel (O&M)	\$75	hr	130	72	\$702,000	ERM Estimate - Assumes 10 hours per week
Project Management	\$120	hr	20	72	\$172,800	ERM Estimate - Assumes 20 hours per quarter
Miscellaneous Equipment	\$2,000	year	1	18	\$36,000	ERM Estimate
Pump Replacement	\$6,000	year	1	18	\$108,000	ERM Estimate - Assumes replacing 3 pumps per year
Annual Sampling	\$15,000	year	1	18	\$270,000	ERM Estimate
<i>Recovery Operation and Maintenance Subtotal</i>					<i>\$1,353,376</i>	
<u>Project Management and Reporting</u>	<u>Unit Cost</u>	<u>Units</u>	<u>Quantity</u>	<u>Years</u>	<u>Cost</u>	<u>Cost Basis</u>
Project Management	\$5,000	year	1	18	\$90,000	ERM Estimate
Data Evaluation and Reporting	\$15,000	year	1	18	\$270,000	ERM Estimate
<i>Project Management and Reporting Subtotal</i>					<i>\$360,000</i>	
<u>On-site Disposal Operation and Maintenance (Annual)</u>	<u>Unit Cost</u>	<u>Units</u>	<u>Quantity</u>	<u>Years</u>	<u>Cost</u>	<u>Cost Basis</u>
Chemical Treatment (Biocide)	\$10,000	year	1	18	\$180,000	ERM Estimate, Peak Energy
Acid Wash SWD (\$100,000 every two years)	\$50,000	year	1	18	\$900,000	ERM Estimate, Peak Energy
<i>On-site Disposal Operation and Maintenance (Annual) Subtotal</i>					<i>\$1,080,000</i>	
<b>Total Cost - 18 Years of Operation</b>					<b>\$4,252,947</b>	

## **Exhibit 1**



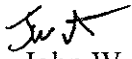
JOHN BEL EDWARDS  
GOVERNOR

State of Louisiana  
DEPARTMENT OF NATURAL RESOURCES  
OFFICE OF CONSERVATION

THOMAS F. HARRIS  
SECRETARY

RICHARD P. IEYOUB  
COMMISSIONER OF CONSERVATION

MEMORANDUM

TO: Richard P. Ieyoub, Commissioner of Conservation  
FROM:  John W. Adams, Attorney, LDNR/Office of Conservation  
DATE: December 12, 2018  
RE: Landowner Consent

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ISSUE

Should landowner consent be required for a Most Feasible Plan (MFP) including exceptions to LAC 43:XIX.Subpart 1 (Statewide Order 29-B) which is approved or developed by the Agency as a result of evidence at an Act 312 public hearing?

**THERE IS NO BASIS FOR REQUIRING LANDOWNER CONSENT FOR MFP ISSUED TO A REVIEWING COURT IN CONTEXT OF AN ACT 312 PUBLIC HEARING**

Landowner consent has not been required by Louisiana Department of Natural Resources, Office of Conservation (hereinafter "LDNR/OC" or "Agency") when a case goes through an Act 312 public hearing and a Most Feasible Plan including exceptions to LAC 43:XIX.Subpart 1 (29-B) is approved or developed as a result of evidence at an Act 312 public hearing. The reason is that the court is an active participant in that situation, as explained more fully below.

Act 312 took effect in 2006 when the Governor signed Senate Bill 655 of the 2006 Regular Session into law. La. Acts 2006, No. 312, eff. June 8, 2006, which is codified at La. R.S. 30:29. Act 312 set forth requirements for pursuing claims for environmental damages caused by oilfield operations. It was immediately challenged as unconstitutional by landowner, M.J. Farms, Ltd., which owned property in Catahoula Parish on which it claimed certain defendants had caused environmental damage from oil and gas operations. The constitutional basis for the landowner's challenge was that Act 312 violated La. Const. art. V, § 16 (divestiture of the district courts of original jurisdiction), the Fifth Amendment of the United States Constitution (the deprivation of a landowner of his property without due process), and La. Const. art. I, § 4 (divestiture of the landowner's right to acquire, own, control, use, enjoy, protect and dispose of private property). The first basis was a denial of "access to courts" argument. The Seventh Judicial District Court in Catahoula Parish entered a judgment declaring Act 312 unconstitutional. On appeal, the Louisiana Supreme Court concluded the district court erred in finding Act 312

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of 2006 unconstitutional. *M.J. Farms, Ltd. v. Exxon Mobil Corp.*, 2007-2371 (La. 7/1/08), 998 So.2d 16. On the “access to courts” argument, the Court said the following:

Although Act 312 changes the remedy available to M.J. Farms in its efforts to obtain surface restoration of its immovable property, we do not find this denies it access to the courts. To the contrary, under the provisions of Act 312 the district court remains an active participant in the entire restoration process. It is the filing of pleadings in the district court making demand for environmental damages that triggers implementation of Act 312. See La.Rev.Stat. § 30:29(B)(1). Furthermore, it is in the district court that it is determined whether environmental damages exists, who caused the damage, and it is the district court that orders the development of a restoration plan. La.Rev.Stat. § 30:29(C)(1). Finally, it is the district court who considers the various restoration plans, including any that the surface owner may choose to submit, determines which one is most feasible, and oversees the implementation of the restoration plan. La.Rev.Stat. § 30:29(C)(5). Accordingly, we find no merit to M.J. Farms' contrary assertion.

*Id.*, at 37-38. See also *State v. Louisiana Land & Exploration Co.*, 2012-0884 (La. 1/30/13, 110 So.3d 1038, 1057.

LDNR/OC has required landowner consent for cleanup plans which include exceptions to 29-B in regulatory actions, including those pursuant to Act 312, for site evaluation and/or remediation of oilfield sites in cases where no Act 312 contradictory public hearing is involved. Landowner consent is required even though this is not explicitly set forth as a requirement for a cleanup plan anywhere in the regulations. LDNR/OC has looked to the definition of “contamination” in Statewide Order No. 29-B, specifically in LAC 43:XIX.301, which is “the introduction of substances or contaminants into a groundwater aquifer, a USDW or soil in such quantities as to render them unusable for their intended purposes.” It is in reliance on this definition that LDNR/OC has required landowner consent as a matter of practice in cases where there is no contradictory hearing because, as it has said, “only a landowner or court of law can truly make a decision as to what a given property’s “intended purpose” is.” See *e.g.*, Letter of James H. Welsh, Commissioner of Conservation, to Louis E. Buatt, Esq., attorney for BP, dated 10/27/15.

But the Act 312 public hearing cases with an issued Most Feasible Plan with 29-B exceptions have been treated differently because the court is an active participant. There have been seven cases where a MFP with 29-B exceptions was issued to a reviewing court as a result of evidence at an Act 312 public hearing, which as described below, is a contradictory hearing. Landowner consent has not been required by the reviewing court in any of those cases. (See [Appendix A](#) at the end of this Memorandum). It is important to recognize that the Agency’s consistent application of the law and regulations in accepting or developing MFP’s with 29-B exceptions issued to reviewing courts specific to the issue of landowner consent has been, to date, accepted by the reviewing courts and participating parties.

There is a valid basis for making a distinction between the public hearing cases and the non-public hearing cases on the issue of whether landowner consent is required. Unlike the non-public hearing cases, in the public hearing cases the landowner has the opportunity to put forth a competing plan and/or comments to the responsible party’s plan. Also, during the public hearing, the landowner has the right and opportunity to put on evidence to protect and/or advance the landowner interest. The hearing is contradictory in nature and permits cross-examination of the responsible party’s witnesses by the landowner, and also permits cross-examination of the landowner’s witnesses by the responsible party. The LDNR/OC panelists also get to ask their own questions of witnesses about the competing plans. Since the landowner is present to defend and advance the landowner interest, LDNR/OC panelists can focus on the public interest as intended by Act 312. In addition to this contradictory hearing, the Act 312 process includes substantial opportunity for active court involvement after the MFP is structured by LDNR/OC (see steps 6 and 7 below). The process from start to finish includes:

1. Step 1 The plaintiff/landowner files suit, and the court holds a trial to determine that environmental damage exists and the party or parties who caused the damage.” La. R.S. 30:29(B) & (C)(1).
2. Step 2 The court orders the responsible party to develop and submit a remediation plan(s) to LDNR/OC for review and consideration. La. R.S. 30:29(C)(1).
3. Step 3 The plaintiff/landowner is given the opportunity to provide a landowner plan or provide comment or response to the other plan(s). La. R.S. 30:29(C)(1).
4. Step 4 LDNR/OC conducts a public hearing—a contradictory hearing—on the plan(s). La. R.S. 30:29(C)(2)(a).
5. Step 5 LDNR/OC accepts a plan submitted, or structures a plan, based on the evidence, which LDNR/OC determines to be the Most Feasible Plan to evaluate or remediate the environmental damage and protect the health, safety and welfare of the people. La. R.S. 30:29(C)(2)(a).
6. Step 6 The court adopts the LDNR/OC plan unless a party proves to the court by a preponderance of the evidence that another plan is a more feasible plan to adequately protect the environment and the public health, safety and welfare. La. R.S. 30:29(C)(5).
7. Step 7 The court issues such orders as necessary to ensure that funds are expended in a manner consistent with the adopted plan, retains oversight to ensure compliance with the plan, and retains continuing jurisdiction until such time as the evaluation or remediation is completed. La. R.S. 30:29(D) & (F).

Since 1) landowner consent is not explicit in the regulations, 2) the public hearing process is a contradictory process giving the landowner the opportunity to offer a competing plan and/or comments to the responsible party’s plan, of cross-examination the responsible party’s witnesses, and to put on evidence, and 3) the court has continuing oversight of the entire process after the structuring of the MFP in the public hearing, including conducting a preponderance hearing if necessary, ensuring funding of the plan, and ensuring compliance of the plan right up to the time remediation is completed, there is no basis for landowner consent as a requirement in Act 312 public hearing cases.

The overriding interest in Act 312 is the public interest. *See* La. R.S. 30: 29(A). Requiring landowner consent for a plan in all events, even if the evidence at the public hearing does not support a finding that such a plan (i.e., the plan requiring landowner consent) is the most feasible plan, would, or could, result in the structuring of a plan by LDNR/OC that is not the most feasible from the standpoint of the public interest (i.e., from the standpoint of protection of the environment, public health, safety and welfare).

Finally, should a party feel aggrieved by the Agency’s acceptance or development of an MFP and issuance to a reviewing court following court referral pursuant to the agency mandated Act 312 public hearing process, the aggrieved party’s legal recourse is and remains with the reviewing court.



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**APPENDIX A**

The seven LDNR/OC Act 312 public hearing cases with issued MFP to date are as follows:

1. **In Re: Tensas Poppadoc, et al v. Chevron (USA), Inc., et al, LDNR/OC Docket No. ENV 2008-L-01:**  
(Responsible Party—Chevron) (Act 312 public hearing February 9-13 and 16, 2009):

This was the first Act 312 public hearing case. It came shortly after Act 312 was held constitutional in 2008. Numerous defendants, including Chevron, were sued by Tensas Poppadoc in 2006 pursuant to La. R.S. 30:29 alleging soil and groundwater contamination on the Tensas Poppadoc property. The case was tried to a jury in Concordia Parish in 2008. Following the jury trial, the trial court signed an order which sent the matter to LDNR/OC for consideration of a remediation plan submitted by Chevron. The court's order stated that the trial court retained jurisdiction pending approval and completion of an approved remediation. An LDNR/OC three-person panel conducted an Act 312 hearing on February 9-13 and 16, 2009. The Most Feasible Plan adopted by LDNR/OC required further collection of site data before a final remedy could be approved. Plaintiff objected to the Most Feasible Plan and appealed to the trial court in Concordia Parish. The case settled in 2014. Following settlement, Chevron moved forward with implementation of the Most Feasible Plan. The Final Report on the last round of data is due to be submitted to LDNR/OC in January 2019.

2. **In Re: Clyde Reese, et al v. Carl Oil & Gas Co., et al, LDNR/OC Docket No. ENV-2012-L-001:**  
(Responsible Party—UNOCAL) (Act 312 public hearing March 21, 2012):

The landowners sued Union Oil Company of California (UNOCAL) and other operators in 2006 for alleged damage to approximately 692 acres in Sections 4 and 5, Township 12 South, Range 2 West, Vermilion Parish, West Gueydan Field, arising from oil and gas operations. UNOCAL and/or its predecessor, The Pure Oil Company, operated four wells on approximately 50 acres of the property at issue ("UNOCAL Operational Tract" or "UOT"). UNOCAL filed a limited admission of liability under Act 312, admitting that "environmental damage" existed on the UOT (that portion of the acreage at issue referred to by landowners as the "Benoit Tract"), and praying for an order accepting that admission, ordering UNOCAL to develop an evaluation/remediation plan, and otherwise ordering the post-admission actions required under Act 312. The court signed an order on September 12, 2011 accepting UNOCAL's admission and ordering submission of a plan to LDNR/OC. The UNOCAL plan was submitted to LDNR/OC on November 28, 2011. A public hearing was held before LDNR/OC on March 21, 2012. On May 17, 2012, LDNR/OC submitted the Most Feasible Plan to the trial court. On July 16, 2012, the court issued an order adopting the MFP. Work is ongoing on the Benoit Tract pursuant to the MFP. The underlying litigation is still pending.

3. **In Re: Hazel Richard Savoie, et al v. Alice T. Richard, et al, LDNR/OC Docket No. 2012-L-002**  
(Responsible Party—Shell) (Act 312 public hearing August 7-10 and 13, 2012):

Shell Oil Company was sued along with subsequent operators in a lawsuit by the landowners, Hazel R. Savoie and family, in state district court in Cameron Parish relating to historical operations in the Kings Bayou Field. After a 2011 jury trial and verdict finding the existence of environmental damage and Shell as a responsible party, a public hearing was held at LDNR/OC from August 7-10 and 13, 2012 to determine the most feasible plan for the site. During the hearing, the landowner presented the LDNR/OC panel with an affidavit attesting to their intended use of the property and refusal to consent to any exceptions to Statewide Order No. 29-B. Following the hearing, in consideration of the landowner's testimony presented during the public hearing, LDNR/OC made modifications to the Shell plan, which LDNR/OC then recommended to the court as the most feasible plan. The landowners filed a motion for a preponderance hearing in the trial court to challenge the plan but withdrew the

motion on the second day of the hearing. The court then adopted the LDNR/OC-recommended plan as the most feasible plan. Shell is currently implementing the plan and continues to work with LDNR/OC on the remediation. In 2015, Shell and the landowners settled ancillary issues, and LDNR/OC issued a letter of no objection.

4. **In Re: Agri-South, LLC, et al v. Exxon Mobil, et al, LDNR/OC Docket No. ENV-2013-L-02**  
(Responsible Party—Tensas Delta) (Act 312 public hearing August 5-9 and 13-16, 2013):

Tensas Delta Exploration Company and ExxonMobil Corporation were sued along with others in a legacy lawsuit by the landowners, Agri-South Group, LLC; Plug Road, LLC; and King Brothers Land Company, LLC., in state district court in Catahoula Parish. In connection with this litigation, Tensas Delta made a limited admission of responsibility and submitted its remediation plan pursuant to La. CCP art. 1563 and La. R.S. 30:29 on January 25, 2013. Plaintiffs/landowners submitted an alternative remediation plan for LDNR/OC's consideration. LDNR/OC held a public hearing August 5-9 and 13-16, 2013 for the purpose of approving or structuring a final plan. On October 3, 2013, LDNR/OC submitted its most feasible plan to the court as required by La. R.S. 30:29(C)(3)(b)(ii). Following submission of the most feasible plan, the litigation progressed until the parties reached a settlement agreement. A redacted form of the settlement between the parties was submitted to LDNR/OC. LDNR issued a letter of no objection to the proposed settlement dated December 16, 2014.

5. **In Re: Martha Zoe Moore, et al v. Denbury Onshore, LLC, LDNR/OC Docket No. ENV-2015-L-01:**  
(Responsible Party—Denbury) (Act 312 public hearing August 25-26, 2015):

The Moore family landowners filed suit against Denbury Onshore, LLC over a spill incident in March 2013. Denbury made a limited admission of responsibility pursuant to La. C.C.P. art. 1563 and La. R.S. 30:29 on January 25, 2013. On March 23, 2015, Magistrate Judge Karen Hayes of the federal Western District of Louisiana, Monroe Division, signed the requested order and referred the matter to the LDNR/OC for a public hearing. Remediation plans were submitted by both Denbury and the Moore family. A public hearing was held on August 25-26, 2015 and LDNR/OC issued its Most Feasible Plan which was filed with the federal court in Monroe, Louisiana on October 22, 2015. The *Moore* case settled on the eve of trial in 2016. Part of the settlement involved an agreed to scaling back of the scope of the Most Feasible Plan adopted by the LDNR/OC, and LDNR/OC agreed to the revised plan. The settlement was approved by the court. Denbury is still executing part of the revised plan that involves groundwater monitoring in one well, and a vegetative recovery assessment that will be conducted in mid-2019.

6. **In Re: State of Louisiana and the Vermilion Parish School Board v. The Louisiana Land and Exploration Co., Union Oil Company of California, Union Exploration Partners, Ltd., Carrollton Resources, L.L.C. and Phoenix Oil & Gas Corporation, LDNR/OC Docket No. ENV-L-2016-01**  
(Responsible Party—UNOCAL) (Act 312 public hearing March 2-4, 7-10, 2016):

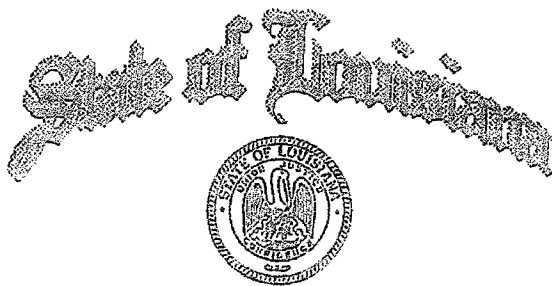
This case was filed by the Vermilion Parish School Board against numerous defendants in 2004. In 2010, UNOCAL filed an admission of environmental damage under R.S.30:29. The case was tried to a jury in Vermilion Parish in 2015, with UNOCAL and Chevron as the only remaining defendants. Based upon UNOCAL's admission, the jury found environmental damage and found UNOCAL responsible. After a jury verdict with a remediation plan of \$3 million, the court referred the matter to LDNR/OC, where a public hearing was held on March 2-4 and 7-10, 2016 before a LDNR/OC panel. LDNR issued its Most Feasible Plan in July 2016. Plaintiff landowner objected to this plan in so far as it ordered UNOCAL, and not plaintiff, to implement the plan. The Most Feasible Plan was affirmed by the trial court and the court of appeal. UNOCAL is currently in the process of implementing the Most Feasible Plan. A final judgment has been entered in the trial court and various matters

are awaiting appeal, except plaintiff's motion for attorney's fees which is set for hearing beginning December 4, 2018.

7. **In Re: The Sweet Lake Land & Oil Company, LLC v. Oleum Operating Company, LLC, LDNR/OC Legacy Project No. 014-006-001** (Responsible Party—BP) (Act 312 public hearing April 25-28, 2016):

Sweet Lake Land & Oil Company, LLC, filed a petition on March 5, 2010, seeking damages caused by oil and gas operations from BP Products North America, Inc. and other defendants, to property Sweet Lake owned in Section 34, Township 10 South, Range 6 West, in Calcasieu Parish, in the East Bell City Oil and Gas Field. BP predecessors operated 10 wells, including two saltwater disposal wells on the property. By the time of trial, May 11, 2015 through May 27, 2015, the only remaining defendants were BP and Oleum/AKSM. The jury found that BP was responsible for "environmental damage" under Act 312 and estimated the remediation costs to be \$1,500,000.00. The trial court referred the matter to LDNR/OC for Act 312 public hearing proceedings. BP and Sweet Lake submitted proposed plans to LDNR/OC. A public hearing was held from April 25-28, 2016. On October 3, 2016 LDNR/OC issued its Most Feasible Plan, essentially agreeing with the soil remediation plan of BP's experts, including soil restoration where proposed, with additional requirements for sampling and delineation. The MFP rejected both parties' experts' groundwater plan and ordered BP to submit a comprehensive groundwater investigation and aquifer characterization work plan. The MFP adopted by LDNR/OC require soil remediation for 29-B salt exceedances to root zone depth and used RECAP to address constituents with no standards in Statewide Order No. 29-B. A hearing in the trial court was held February 15, 2017 on BP's motion to adopt the MFP. The court denied the motion and ordered LDNR/OC to "submit a final plan to the court that includes a remediation plan for all environmental damage to be remediated." The court ordered LDNR/OC to state remediation options based on different outcomes in the further evaluation of shallow groundwater. The court also ordered LDNR/OC to "specify the flowlines on the property and include a remediation plan for flowlines that must be removed." BP sought writs from this ruling, which were denied. On October 26, 2017, LDNR/OC issued a compliance order in response to the court's ruling, which stated that in order to obtain the necessary information pursuant to satisfying the court's directive for additional information pertaining to final remediation of the Sweet Lake property, specific aspects of LDNR/OC's Plan must be completed and reported to the Agency for consideration, all incumbent upon the responsible party, BP, of which the court and all parties were informed with no subsequent response provided to the Agency from any party in opposition or to the contrary. The Agency's application of the law and regulation on the matter of landowner consent and its MFP decision was not an apparent issue before the court. On October 5, 2018 LDNR/OC approved HET's (BP's expert's) January 19, 2018 evaluation plan and work under the plan commenced on November 2, 2018.

## **Exhibit 2**



M.J. "MIKE" FOSTER, JR.  
GOVERNOR

DEPARTMENT OF NATURAL RESOURCES  
OFFICE OF CONSERVATION

JACK C. CALDWELL  
SECRETARY

PHILIP N. ASPRODITES  
COMMISSIONER OF CONSERVATION

July 19, 2000

Ian A. Webster  
Project Navigator, Ltd.  
2600 East Nutwood Avenue  
Suite 830  
Fullerton, California 92831

Re: MAR Services Site Remediation Project Slide Presentation (May 3, 2000)  
Phase II: Soils Management Proposed Remedy  
Mar Services, St. Landry Parish, Louisiana

Dear Mr. Webster:

The Office of Conservation, Injection and Mining Division (IMD) has reviewed the proposed Phase II soils remedy outline for the referenced site contained in the handouts submitted in your presentation on May 3, 2000. Based on the material presented during your presentation in addition to subsequent discussions regarding the same, IMD staff considers the items listed below to represent the most significant aspects of the proposal.

- All metal (barium, zinc) and hydrocarbon (oil & grease) impacted soils, regardless of depth, shall be treated on-site or excavated for off-site disposal for compliance with closure criteria as established in Statewide Order No. 29-B, Section 129.M.7.e.ii.
- All salt impacted areas shall be treated to a depth of three (3) feet to meet closure criteria of 29-B, Section 129.M.7.e.ii.
- All remediated areas shall be graded and vegetated for adequate surface water management.
- New up-gradient and down-gradient groundwater monitoring wells shall be installed.
- All new and existing groundwater monitoring wells shall be maintained and sampled (monitored).

IMD has no objection to this conceptual approach toward closure certification for the referenced site as relates to previous nonhazardous oilfield waste (NOW) commercial facility operations. However, salt impacted soils below three (3) feet and any groundwater concerns are considered to be associated with onsite production waste activities occurring prior to commercial facility operations. Future activities to address groundwater at the MAR site shall be referred to Office of Conservation's Engineering Division.

Ian A. Webster  
July 19, 2000

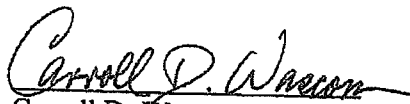
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Therefore, Office of Conservation authorization to conduct Phase II activities shall be contingent upon submission of a written plan for closure certification in accordance with Statewide Order No. 29-B, Section 129.M.7.e. Such plan must be submitted for review and approval before any Phase II soil remediation activities may be initiated. The plan must also address the question of salt wicking upon completion of Phase II activities.

You may contact Mr. Pierre H. Catrou or Mr. Gary Snellgrove at 225/342-5515, if you have any questions about this letter.

Yours truly,

Philip N. Asprodites  
Commissioner of Conservation

By:   
Carroll D. Wascom, Director  
Injection & Mining Division

DW:PHC:gs

CC: John Aldridge, Office of Conservation, Engineering Division  
Earl Moran, ExxonMobil  
Nick Longo, Unocal