

**Exhibit E to Lion Oil Petition**

**Economic Impact / Environmental Benefit Analysis**

**ARKANSAS POLLUTION CONTROL & ECOLOGY  
COMMISSION  
ECONOMIC IMPACT/ENVIRONMENTAL BENEFIT  
ANALYSIS**

**Rule Number & Title:** *Regulation No. 2. Establishing Water Quality Standards for Surface Waters of the State of Arkansas.*

**Petitioner:** *Lion Oil Company (“Lion Oil”)*

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**Date Analysis Prepared:** *12/10/2012*

**2A. ECONOMIC IMPACT**

1. Who will be affected economically by this proposed rule?

State: a) the specific public and/or private entities affected by this rulemaking, indicating for each category if it is a positive or negative economic effect; and b) provide the estimated number of entities affected by this proposed rule.

*The proposed rule will revise the chloride, sulfate, total dissolved solids (“TDS”), and selenium water quality criteria in Loutre Creek (a small waterbody in Union County), and change the fishery use designation for Loutre Creek to a new sub-category of fishery referred to as a Limited Gulf Coastal Fishery. The proposed rule will also revise the chloride, sulfate, and TDS criteria for one downstream segment in Bayou de Loutre, the sulfate and TDS criteria for the next downstream segment in Bayou de Loutre, and the sulfate criteria for the remaining downstream segments of Bayou de Loutre to the Louisiana State line.*

*Assuming the proposed rule is approved by the Commission and the U.S. Environmental Protection Agency (“EPA”), the Arkansas Department of Environmental Quality (“ADEQ”) will be able to rely on the revised criteria to amend Lion Oil’s National Pollutant Discharge Elimination System (“NPDES”) permit limits for sulfate, TDS, and selenium. Lion Oil will therefore be positively impacted by the rule. No entities would suffer negative economic impact as a result of the proposed rule.*

*Sources and Assumptions: To approve the proposed rule, the Commission and EPA will rely on two technical documents prepared by Lion Oil. The first is the Loutre Creek Section 2.303—Use Attainability Analysis (“UAA”) that discusses the new sub-category of fishery for Loutre Creek and the proposed revisions to the dissolved minerals and selenium criteria for that waterbody. The second is the Bayou de Loutre Section 2.306—Site Specific Water Quality Study (“SSC”) that discusses the proposed revisions to the dissolved minerals criteria for Bayou de Loutre.*

2. What are the economic effects of the proposed rule? State: 1) the estimated increased or decreased cost for an average facility to implement the proposed rule; and 2) the estimated total cost to implement the rule.

*The economic effects of the proposed rule are significant and beneficial for Lion Oil. Lion Oil has undertaken considerable efforts to investigate technologies and alternatives to comply with the sulfate, TDS, and selenium limits in its current permit. The alternative analysis is summarized in Section 8 of the UAA. As briefly explained below, reasonably available control technology does not exist that would allow Lion Oil to consistently meet these current permit limits. Approval of the proposed rule modifying the criteria to reflect long term historical site specific conditions is the only reasonable approach so that the permit limits can be adjusted.*

*The alternative analysis demonstrates that the lowest cost pollution control technology that could conceivably reduce sulfate and TDS in the facility's wastewater to the levels in the permit is reverse osmosis with deep well injection of the concentrated brine generated by this process. This technology may not be technically feasible because deep well injection requires identifying a suitable non-producing formation to dispose of the brine and no suitable formation has been identified. Even if technically feasible, the estimated capital cost of reverse osmosis with deep well injection is unreasonable at \$33,800,000 with \$4,400,000 in annual operating expenses. Deep well injection of the brine would also require new permits for disposal wells, acquisitions of easements for pipelines and subsurface facilities and subsurface injection lease rights, as well as the construction of the pipelines and well heads. If implemented, the reverse osmosis process may still not reduce selenium to the current permit limitations, so it could still be necessary to install additional technology to further reduce selenium (these additional technologies and costs are discussed in the alternative analysis). In addition, Lion Oil estimates that even if a suitable formation could be located for deep well injection, it could take 10 years or more to obtain permits, construct the deep well injection network, including a network of pipelines to carry the reverse osmosis reject stream to the disposal wells, and to secure the approvals to install the pipelines (rights of way, easements, etc.).*

*By contrast, the proposed rule to change the criteria is the only alternative to address Lion Oil's discharges to Loutre Creek.<sup>1</sup> As noted, ADEQ would be able to rely on the revised criteria to amend Lion Oil's sulfate, TDS, and selenium limits. The total estimated cost for Lion Oil to implement the proposed rule through permitting is unknown, but is unlikely to be significant.*

Sources and Assumptions: *Section 8 of the UAA (alternative analysis).*

3. List any fee changes imposed by this proposal and justification for each.

*No changes to fees are proposed or anticipated for the proposed rule.*

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<sup>1</sup> *Lion Oil has joined with other NPDES permit holders in the region to construct a multi-million dollar pipeline to discharge to the Ouachita River. This new discharge location will enable Lion Oil to meet its permit limits for the Ouachita River. However, without the proposed rule to revise the criteria, Lion Oil will not be able to consistently meet its current permit limits that apply to its discharge to Loutre Creek.*

4. What is the probable cost to ADEQ in manpower and associated resources to implement and enforce this proposed change, and what is the source of revenue supporting this proposed rule?

*Lion Oil anticipates that ADEQ will administer and enforce the proposed rule with the same number of staff and resources it currently relies on to implement the permitting program.*

Sources and Assumptions: *not applicable*

5. Is there a known beneficial or adverse impact to any other relevant state agency to implement or enforce this proposed rule? Is there any other relevant state agency's rule that could adequately address this issue, or is this proposed rulemaking in conflict with or have any nexus to any other relevant state agency's rule? Identify state agency and/or rule.

*ADEQ would rely on the proposed rule to amend Lion Oil's NPDES permit. There is no known impact to another state agency nor is there another state agency's rule that could address any of the proposed changes. The rule is not in conflict with any other relevant state agency rule. To Lion Oil's knowledge, the rule does not have any nexus to any other relevant state agency's rule.*

Sources and Assumptions: *not applicable*

6. Are there any less costly, non-regulatory, or less intrusive methods that would achieve the same purpose of this proposed rule?

*No.*

Sources and Assumptions: *not applicable*

## **2B. ENVIRONMENTAL BENEFIT**

1. What issues affecting the environment are addressed by this proposal?

*The proposed rule will revise the chloride, sulfate, TDS, and selenium water quality criteria in Loutre Creek, and change the fishery use designation for Loutre Creek to a new sub-category of fishery referred to as a Limited Gulf Coastal Fishery reflecting the long term historical in-stream concentrations and uses. The proposed rule will also revise the chloride, sulfate, and TDS criteria for one downstream segment in Bayou de Loutre, the sulfate and TDS criteria for the next downstream segment in Bayou de Loutre, and the sulfate criteria for the remaining downstream segments of Bayou de Loutre to the Louisiana State line. As explained below, these changes will not adversely impact the environment.*

*Fishery sub-category. Loutre Creek is currently designated as supporting a Typical Gulf Coastal Fishery. The rule proposes a new sub-category of fishery for Loutre Creek referred to as a Limited Gulf Coastal Fishery. This limited fishery includes 12 species of fish identified during Lion Oil's 2009-2010 Aquatic Life Field Study of Loutre Creek as compared to the 24 or more species of fish that may characterize a Typical Gulf Coastal Fishery. This sub-*

*categorization of the fishery does not change the actual fishery in Loutre Creek, but documents the appropriate composition of the fishery and the selenium criterion to protect that fishery.*

*Dissolved minerals criteria. In 2007, the Commission approved Lion Oil's Third Party Rulemaking to establish new dissolved minerals criteria for Loutre Creek and Bayou de Loutre. These criteria remain codified in Regulation No. 2, but EPA disapproved them in 2009 and requested additional information before it would approve them. The technical documentation that the Commission would rely on to approve the proposed rule includes this additional information and requests adoption of new dissolved minerals criteria that are more stringent than the criteria previously approved. Although the dissolved minerals criteria previously approved by the Commission are scientifically justified, Lion Oil proposes more stringent criteria because it believes it can comply with the more stringent criteria. The proposed rule will not result in an increase in dissolved minerals discharged to Loutre Creek or Bayou de Loutre because the rule establishes criteria more stringent than Lion Oil's historic discharge.*

*Selenium criterion. The proposed rule will not cause an increase in the amount of selenium discharged to Loutre Creek or Bayou de Loutre because it will establish a selenium criterion consistent with Lion Oil's historic discharge. Selenium is found in crude oil and is transferred to wastewater in the refining process. Consequently, it has likely been present in Loutre Creek since refining activities began in the watershed almost 90 years ago. The on-going presence of the Limited Gulf Coastal Fishery in Loutre Creek and the Typical Gulf Coastal Fishery in Bayou de Loutre indicates that existing concentrations of selenium are compatible with those fisheries.*

2. How does this proposed rule protect, enhance, or restore the natural environment for the well being of all Arkansans?

*The criteria proposed in the rule are protective of the fisheries in Loutre Creek and Bayou de Loutre. To approve the rule, the Commission and EPA will also confirm that the proposed criteria are protective of these fisheries and the environment.*

*Sources and Assumptions: Section 3 of the UAA (fisheries use designation and modification), Section 2 of the UAA (significant findings and recommendations for Loutre Creek), and Section 4 of the SSC (significant findings and recommendations for Bayou de Loutre).*

3. What detrimental effect will there be to the environment or to the public health and safety if this proposed rule is not implemented?

*Without the proposed rule, Lion Oil would not be able to consistently meet its permit limits that apply to its discharge to Loutre Creek. Lion Oil (and the prior owners) have discharged to Loutre Creek for nearly 90 years. The discharge does not adversely impact the environment, public health, or safety.*

*Sources and Assumptions: Section 2 of the UAA and Section 4 of the SSC.*

4. What risks are addressed by the proposal and to what extent are the risks anticipated to be reduced?

*ADEQ would be able to rely on the criteria proposed in the rule to amend Lion Oil's sulfate, TDS, and selenium NPDES permit limits.*

Sources and assumptions: *not applicable*

