

# BOIS D'ARC EXPLORATION

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The Woodlands, Texas 77380  
(713) 223-7100

August 21, 2015

FedEx Tracking No. 803457848545

Mr. Isaac Chen  
U.S. Environmental Protection Agency, Region 6  
Regional Oil & Gas Coordinator  
1445 Ross Avenue – Mail Code-6WQ-PP  
Dallas, Texas 75202-2733

Subject: GMG290000 Permit –Water Based Drilling Mud Characterization Study  
Bois d'Arc Exploration LLC – GMG290398

Dear Mr. Chen

Per the permit requirements in Part I.B.1.d – Water Based Drilling Mud Characterization Study, Bois d'Arc has conducted an individual study and has collected one sample from each producing lease block for which they are the designated operator. Bois d'Arc has one drilling project to report for the 3-year study time frame: Ship Shoal 171 – Well #002.

The water based mud (WBM) samples were analyzed for the required metals, including: arsenic, cadmium, chromium (VI), copper, free cyanide, lead, mercury, nickel, selenium, silver, and zinc. As noted on the summary of analytical data, the WBM sample results are provided as total metals, not dissolved, as requested in Part 1.B.1.d, for the reasons described below.

As discussed in detail in Appendix D of the Sampling and Analysis Plan for the Mud and Produced Water Characterization Study (MPWCS) prepared for the Offshore Operator Committee (OOC) Joint Study Group, numerous group locations had issues with WBM samples not yielding enough water for dissolved phase metals analyses. Attempts to dilute the drilling mud and then extract water raised concerns about the interpretation of the results. The use of alternate methods for separating more water from the water based mud was studied and rejected. Per an agreement at a February 15, 2014 meeting between OOC representatives and EPA Region 6, the Sampling and Analysis Plan was revised (March 24, 2014) to allow samples that do not yield adequate water to perform analysis of dissolved metals and cyanide to instead analyze for total metals, hexavalent chromium, and cyanide. Samples that do yield enough water will also be analyzed for dissolved constituents, in order of priority: (1) metals; (2) hexavalent chromium; (3) cyanide.

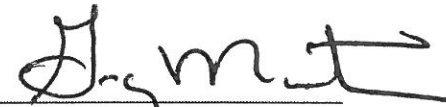
The sample collected at SS171 did not yield enough water to conduct dissolved phase metals analyses. As an individual study participant, Bois d'Arc is following the same protocol approved for the joint study operators and is reporting total metals, hexavalent chromium and cyanide.

A summary of the analytical results are presented in the attached Excel table and summary page of the laboratory report. This report is being submitted via hard copy, as well as by email to chen.isaac@epa.gov. The emailed report also contains the Electronic Data Deliverable (EDD) from ALS Laboratory which is an Excel table that is not easy to follow in a printed, hard copy format. The Excel table attached herein provides a more readable summary of the EDD. The complete analytical report from the laboratory can be provided upon request.

Should you have any questions, please call me or our consultant, Ms. Marsha Lutz, of J. Connor Consulting, Inc. at 281-698-8557.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

**BOIS D'ARC EXPLORATION LLC**

A handwritten signature in black ink, appearing to read "G. Martin", written over a horizontal line.

Greg Martin  
Chief Operating Officer

Attachment

REF: DT5516/02265

**Water Based Mud Characterization Study - Sampling Results**  
**Bois d'Arc Exploration LLC - GMG290398**

Lease Block/Area	Lease No.		Sampling Date	
Ship Shoal 171 -Well #002	OSC-G: 33645		1/1/2015	
<b>Parameter</b> <b>*All metals analyzed for total concentrations in the solid phase.</b>	<b>Min. Conc.</b> <b>mg/kg</b>	<b>Max.Conc.</b> <b>mg/kg</b>	<b>Avg. Conc.</b> <b>mg/kg</b>	<b>RL</b> <b>mg/kg</b>
Arsenic	< 0.499	< 0.499	< 0.499	0.499
Cadmium	< 0.499	< 0.499	< 0.499	0.499
Chromium, VI	< 1.99	< 1.99	< 1.99	1.99
Copper	<b>0.728</b>	<b>0.728</b>	<b>0.728</b>	0.499
Cyanide	< 1.86	< 1.86	< 1.86	1.86
Lead	<b>1.67</b>	<b>1.67</b>	<b>1.67</b>	0.499
Mercury	< 0.00336	< 0.00336	< 0.00336	0.00336
Nickel	< 0.499	< 0.499	< 0.499	0.499
Selenium	< 0.499	< 0.499	< 0.499	0.499
Silver	< 0.499	< 0.499	< 0.499	0.499
Zinc	<b>41.6</b>	<b>41.6</b>	<b>41.6</b>	0.499

\* Per an agreement made at a 2/15/14 meeting between EPA Region and OOC Joint Study participants, it was agreed that where the sample could not yield adequate water for dissolved phase metals analyses that the analyses would be conducted for total metals concentrations in the solid phase.

ND - Not Detected at the Reporting Limit (RL). Shown as < RL value.

Client: Tetra Tech, Inc.  
 Project: 212C-HN-00060  
 Sample ID: GISY-SS-171  
 Collection Date: 01-Jan-2015 02:00

**ANALYTICAL REPORT**  
 WorkOrder:HS15010027  
 Lab ID:HS15010027-01  
 Matrix:Sludge

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>METALS BY SW6020A</b> Method: SW6020A Prep: SW6020A / 06-Jan-2015 Analyst: JBJ						
Arsenic	ND		0.499	mg/Kg	1	06-Jan-2015 02:01
Cadmium	ND		0.499	mg/Kg	1	06-Jan-2015 02:01
Copper	0.728		0.499	mg/Kg	1	06-Jan-2015 02:01
Lead	1.67		0.499	mg/Kg	1	06-Jan-2015 02:01
Nickel	ND		0.499	mg/Kg	1	06-Jan-2015 02:01
Selenium	ND		0.499	mg/Kg	1	06-Jan-2015 02:01
Silver	ND		0.499	mg/Kg	1	06-Jan-2015 02:01
Zinc	41.6		0.499	mg/Kg	1	06-Jan-2015 02:01
<b>HEXAVALENT CHROMIUM BY SW7196A</b> Method: SW7196 Prep: SW7196A / 06-Jan-2015 Analyst: KHT						
Chromium, Hexavalent	ND		1.99	mg/kg	1	06-Jan-2015 16:11
<b>CYANIDE</b> Method: SW9014 Prep: SW9014 / 06-Jan-2015 Analyst: KHT						
Cyanide	ND		1.86	mg/Kg	1	06-Jan-2015 16:18
<b>MERCURY BY SW7471B</b> Method: SW7471A Prep: SW7471A / 06-Jan-2015 Analyst: CFO						
Mercury	ND		3.36	ug/Kg	1	06-Jan-2015 15:21

Note: See Qualifiers Page for a list of qualifiers and their explanation.



ALS Laboratory Group  
 10450 Stancliff Rd. #210  
 Houston, Texas 77099  
 (Tel) 281.530.5656  
 (Fax) 281.530.5887

HS15010027

Tetra Tech, Inc.  
 212C-HN-00060



Chain of Custody Form

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Customer Information		ALS Project Manager: Kristin Brown		Parameter/Method Request for Analysis																			
Project Information		Dissolved Metals (6020/7000) As, Cd, Cu, Pb, Ni, Se, Ag, Zn, Hg																					
Project Name		Dissolved Cyanide (9014)																					
Project Number		Dissolved Hexavalent Chromium (218.6)																					
Bill To Company																							
Invoice Attn.																							
Address																							
City/State/Zip																							
Phone																							
Fax																							
e-Mail Address																							
Purchase Order	1097177	Date	1/11/15	Time	02:00	Matrix	WBM	Pres.	2	Bottles	A	B	C	D	E	F	G	H	I	J	Hold		
Work Order																							
Company Name	Tetra Tech-GA																						
Send Report To	June Mire																						
Address	1408 Pasadena Avenue																						
City/State/Zip	Metairie, LA 70001																						
Phone	504-273-9186																						
Fax																							
e-Mail Address	June.mire@tetratech.com																						
No.	1	Sample Description																					
	2																						
	3																						
	4																						
	5																						
	6																						
	7																						
	8																						
	9																						
	10																						
Sampler(s): Please Print & Sign		Preston Carpenter		Date		1/11/15		Time		02:00		Shipment Method:		Required Turnaround Time:		Results Due Date:							
Relinquished by:		Preston Carpenter		Date		1/11/15		Time		02:00		Received by (Laboratory):		R Ciga 01/03/14 9:05		Cooler Temp		Level II: Standard QC		Level III: Std QC + Raw Data		Level IV: SW846 CLP-Like	
Relinquished by:		Preston Carpenter		Date		1/11/15		Time		02:00		Checked by (Laboratory):		6-NAHSON 7-Other 8-4 degrees C 9-5035		Other:		Level I: Standard QC		Level III: Std QC + Raw Data		Level IV: SW846 CLP-Like	
Logged by (Laboratory):				Date				Time				Received by (Laboratory):				Other:		Level I: Standard QC		Level III: Std QC + Raw Data		Level IV: SW846 CLP-Like	
Preservative Key:		1-HCL 2-HNO3		Date				Time				Checked by (Laboratory):				Other:		Level I: Standard QC		Level III: Std QC + Raw Data		Level IV: SW846 CLP-Like	

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Laboratory Group.