FREEPORT-MCMORAN OIL & GAS

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, CA 93455

Telephone: 805-739-9111

December 22, 2014

US EPA, Region 9
Attn: NPDES/DMR, ENF4-1
75 Hawthorne Street
San Francisco, CA 94105-3901

Re: Quarterly Discharge Monitoring Report - Platform Hidalgo NPDES Permit CAG280000

To Whom It May Concern:

This letter and its attachments represent the Discharge Monitoring Report (DMR) for the reporting period of September, October, and November 2014 for Platform Hidalgo.

Included herein are the following attachments:

Attachment 1 is comprised of the EPA DMR forms (3320-1).

Attachment 2 is a listing of the chemical inventory for miscellaneous discharges (specifically non-contact cooling and fire water) as required by II.F. of the subject permit.

Attachment 3 provides required pre-dilution and post dilution chlorine results for fire water discharges in accordance with Appendix C of the permit.

Attachment 4 includes copies of the official state certified lab reports for O & G and miscellaneous NPDES monitoring, and Chronic Whole Effluent Toxicity (WET) testing on red abalone, giant kelp, and topsmelt. Also included are the laboratory quality control reports for the lab reports and other required information (MLs, MDLs, EPA Methods, chains-of-custody, sample dates, etc.).

The following is a brief summary of some of the monitoring and reporting parameters affecting the various discharges:

Drilling Muds and Cuttings (001):

There were no drilling related discharges for this reporting period.

Produced Water (002):

Produced water was discharged throughout this reporting period. Weekly O & G results are summarized in the DMR as end of pipe values. An EPA Plumes UM dilution of 4376:1 was derived using the average flow rate for the quarter. The dilution calculated for this reporting

quarter is applied to quarterly and annual testing results, when applicable, and the numeric values reported in the DMR are post dilution values for comparison to the limits listed in Appendix B of the NPDES permit.

Non-Contact Cooling Water and Fire Water (008,009):

Seawater is slightly chlorinated as it is pumped up onto the platform for both the non-contact cooling water loop and the fire water system as needed. Attachment 3 summarizes the official quarterly chlorine results including post dilution and end of pipe results. Firewater deluge is commingled and discharged with deck drains. Volumes are estimated based on weekly firewater pump tests. Dilution modeling is estimated to be the same for both fire water and non-contact cooling water since the pump rates are similar and outfall dimensions are the same.

The quarterly testing results and the numeric values for chlorine reported in the DMR are post dilution values for comparison to the permit limits listed in Appendix C of the NPDES permit.

Freeport-McMoRan Oil & Gas uses a contractor to collect NPDES compliance monitoring samples at our offshore platforms. EPA sampling, preservation and documentation protocol is a strict requirement of our monitoring program.

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. See 18 U.S.C & 1001 and 33 U.S.C. & 1319. (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 years)

If you should have any questions or require additional information, please contact me at (805) 934-8220.

Sincerely,

David Rose
Manager
Environmental, Health & Safety

Attachments

cc: Regional Supervisor, BOEM
Ms. Alison Dettmer, CCC
Regional Supervisor, BSEE
Platform Hermosa Foremen

Platform Hidalgo

Attachment 1

EPA DMR
PERMIT NO. CAG280000

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

WELL DISCHARGE MONITORING REPORT (Well DMR)

CAG280000	001
PERMIT NO.	DISCHARGE NO.

Approved Form
OMB No. 2000-0015

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From: 14	09	01	To: 14	11	30

DRILLING FLUIDS AND DRILL CUTTINGS (001)

PLATFORM HIDALGO
LOCATION: 34º 29' 12" , 120º 42' 12"

NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
		Average	Maximum	Units	Minimum	Average	Maximum	Units			
DRILLING FLUIDS VOLUME Well # N / A September	Sample Measurement		No Discharge	Barrels/ Well							
	Permit Requirement		Report							1/well 1/day	Estimate
Well # N / A October	Sample Measurement		No Discharge	Barrels/ Well							
	Permit Requirement		Report							1/well 1/day	Estimate
Well # N / A November	Sample Measurement		No Discharge	Barrels/ Well							
	Permit Requirement		Report							1/well 1/day	Estimate
Well # N / A Quarterly Total 09/01/14 - 011/30/14	Sample Measurement		0	Barrels/ Quarter					0		
	Permit Requirement		Report								
Annual Cumulative Volume Limit 03/01/14 -02/28/15	Sample Measurement		0	Barrels/ Year					0		
	Permit Requirement		23,000								

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER			TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	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. SEE 18 U.S.C. & 1001 AND 33 U.S.C. & 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)	David Rose	(805) 934-8220	12 22 2014
TYPED OR PRINTED		Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

Annual cumulative volume limit is applied to the cumulative volumes for the period of March 2014 through February 2015.

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

WELL DISCHARGE MONITORING REPORT (Well DMR)

CAG280000	001
PERMIT NO.	DISCHARGE NO.

Approved Form
OMB No. 2000-0015

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From:	14	09 01	To:	14	11 30

DRILLING FLUIDS AND DRILL CUTTINGS (001)

PLATFORM HIDALGO
LOCATION: 34º 29' 12" , 120º 42' 12"

NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
		Average	Maximum	Units	Minimum	Average	Maximum	Units			
DRILL CUTTINGS VOLUME Well # N / A September	Sample Measurement		No Discharge	Barrels/ Month							
	Permit Requirement		Report							1/well 1/day	Estimate Grab
Well # N / A October	Sample Measurement		No Discharge	Barrels/ Month							
	Permit Requirement		Report							1/well 1/day	Estimate Grab
Well # N / A November	Sample Measurement		No Discharge	Barrels/ Month							
	Permit Requirement		Report							1/well 1/day	Estimate Grab
Quarterly Cumulative Volume Limit 09/01/14 - 011/30/14	Sample Measurement		0	Barrels/ Year					0		
	Permit Requirement		6,000								
Annual Cumulative Volume Limit 03/01/14 -02/28/15	Sample Measurement		0	Barrels/ Year					0		
	Permit Requirement		6,000								

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TYPED OR PRINTED		Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

Annual cumulative volume limit is applied to the cumulative volumes for the period of March 2014 through February 2015.

Freeport-McMoRan Oil & Gas
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Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

WELL DISCHARGE MONITORING REPORT (Well DMR)

CAG280000	001
PERMIT NO.	DISCHARGE NO.

Approved Form
OMB No. 2000-0015

PLATFORM HIDALGO
LOCATION: 34º 29' 12" , 120º 42' 12"

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From:	14	09 01	To:	14	11 30

DRILLING FLUIDS AND DRILL CUTTINGS (001)

NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
		Average	Maximum	Units	Minimum	Average	Maximum	Units			
DRILL FLUIDS/CUTTINGS FREE OIL	Sample Measurement				No Discharge			# Days Sheen Observed			
September	Permit Requirement				Negative Static Sheen Test/Free Oil					1/well 1/day	Visual Visual
	Sample Measurement				No Discharge			# Days Sheen Observed			
October	Permit Requirement				Negative Static Sheen Test/Free Oil					1/well 1/day	Visual Visual
	Sample Measurement				No Discharge			# Days Sheen Observed			
November	Permit Requirement				Negative Static Sheen Test/Free Oil					1/well 1/day	Visual Visual

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER			TELEPHONE	DATE
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TYPED OR PRINTED		Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

Freeport-McMoRan Oil & Gas
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Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

WELL DISCHARGE MONITORING REPORT (Well DMR)

CAG280000	001
PERMIT NO.	DISCHARGE NO.

Approved Form
OMB No. 2000-0015

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From:		14 09 01	To:		14 11 30

DRILLING FLUIDS AND DRILL CUTTINGS (001)

PLATFORM HIDALGO
LOCATION: 34º 29' 12" , 120º 42' 12"

NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration		NO. EX.	Frequency Analysis	Sample Type
		Average	Maximum	Units	Maximum	Units			
DRILLING FLUIDS TOXICITY Well # N / A	Sample Measurement				N / A	% by Volume			
	Permit Requirement				LC50 > 3% SPP			(0-80%) Well Footage	Grab
DRILLING FLUIDS TOXICITY Well # N / A	Sample Measurement				N / A	% by Volume			
	Permit Requirement				LC50 > 3% SPP			(80-100%) Well Footage	Grab
BARITE MERCURY	Sample Measurement				N / A	mg / kg			
	Permit Requirement				1 mg / kg			Stock Barite	Grab
BARITE CADMIUM	Sample Measurement				N / A	mg / kg			
	Permit Requirement				3 mg / kg			Stock Barite	Grab
DRILL FLUIDS CHEMICAL INVENTORY Well # N / A					N / A				
					Report			Each Mud System	
No. DAYS DISCHARGE FOR EACH DRILLING FLUID					N / A				
					Report			# Days Each	
PROHIBITED DISCHARGE 1. Oil-based Fluids								N/A	
2. Diesel Oil 3. Non-aqueous based drilling fluids or cuttings					No Discharge			N/A	

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	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. SEE 18 U.S.C. & 1001 AND 33 U.S.C. & 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)	(805) 934-8220	12 22 2014
TYPED OR PRINTED	Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

N / A: No drilling discharges

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

CAG280000	002
PERMIT NO.	DISCHARGE NO.

Approved Form
OMB No. 2000-0015

PRODUCED WATER (002)

PLATFORM HIDALGO
LOCATION: 34º 29' 12" , 120º 42' 12"

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From:	14	09 01	To:	14	11 30

NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
		Average	Maximum	Units	Minimum	Average	Maximum	Units			
PRODUCED WATER FLOW RATE (Commingled with WTCF) September	Sample Measurement	5,191		Monthly Average bbl/Day					0	1/day	Estimate
	Permit Requirement									1/day	Estimate
October	Sample Measurement	3,557		Monthly Average bbl/Day					0	1/day	Estimate
	Permit Requirement									1/day	Estimate
November	Sample Measurement	4,284		Monthly Average bbl/Day					0	1/day	Estimate
	Permit Requirement									1/day	Estimate
QUARTERLY AVERAGE Volume 09/01/14 - 011/30/14		4,344		Quarterly Average bbl/Day					0	1/quarter	Estimate
										1/quarter	Estimate
ANNUAL CUMULATIVE Volume 03/01/14 -02/28/15	Sample Measurement		1,313,385	Barrels/ Year					0	1/quarter	Estimate
	Permit Requirement		18,250,000								

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER			TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	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. SEE 18 U.S.C. & 1001 AND 33 U.S.C. & 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)		(805) 934-8220	12 22 2014
TYPED OR PRINTED		Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

Annual cumulative volume limit is applied to the cumulative volumes for the period of March 2014 through February 2015.

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

CAG280000	002
PERMIT NO.	DISCHARGE NO.

Approved Form
OMB No. 2000-0015

PLATFORM HIDALGO
LOCATION: 34º 29' 12" , 120º 42' 12"

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From:	14	09 01	To:	14	11 30

PRODUCED WATER (002)

NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
		Average	Maximum	Units	Minimum	Monthly Average	Daily Maximum	Units			
PRODUCED WATER OIL & GREASE (Commingled with WTCF) September	Sample Measurement					8.6	13.0	mg/L	0	1/week	Grab
	Permit Requirement					29.0	42.0			1/week	Grab/ Composite
October	Sample Measurement					9.6	13.0	mg/L	0	1/week	Grab
	Permit Requirement					29.0	42.0			1/week	Grab/ Composite
November	Sample Measurement					7.0	16.2	mg/L	0	1/week	Grab
	Permit Requirement					29.0	42.0			1/week	Grab/ Composite

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER			TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	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. SEE 18 U.S.C. & 1001 AND 33 U.S.C. & 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)	David Rose	(805) 934-8220	12 22 2014
TYPED OR PRINTED		Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

Freeport-McMoRan Oil & Gas
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NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

CAG280000	002
PERMIT NO.	DISCHARGE NO.

Approved Form
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MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From:	14	09 01	To:	14	11 30

PLATFORM HIDALGO
LOCATION: 34º 29' 12" , 120º 42' 12"

PRODUCED WATER (002)
Quarterly

NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
		Average	Maximum	Units	Minimum	Monthly Average	Daily Maximum	Units			
PRODUCED WATER QUARTERLY CONSTITUENTS	Sample Measurement					P A S S			0	1 / quarter	Composite
3-SPECIES TOXICITY	Permit Requirement					Pass / Fail				1 / quarter	Composite
	Sample Measurement										
	Permit Requirement										
PRODUCED WATER ANNUAL CONSTITUENTS [1]	Sample Measurement					N / A	N / A	mg/L			
BENZENE	Permit Requirement					N / A	N / A			1 / year	Grab
	Sample Measurement					N / A	N / A	mg/L			
BENZO (k) FLUORANTHENE	Permit Requirement					N / A	N / A			1 / year	Grab
	Sample Measurement					N / A	N / A	mg/L			
BENZO (b) FLUORANTHENE	Permit Requirement					N / A	N / A			1 / year	Grab
	Sample Measurement					N / A	N / A	mg/L			
CHRYSENE	Permit Requirement					N / A	N / A			1 / year	Grab
	Sample Measurement					N / A	N / A	mg/L			
UNDISSOCIATED SULFIDE	Permit Requirement					N / A	N / A			1 / year	Grab

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TYPED OR PRINTED		Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)
[1] Results are post-dilution. The annual sampling was completed in March 2014 and the results were reported in a previous DMR.
N / A: There are no limits in the Permit, Appendix B.
NODI(B): below MDL . The maximum value of the analytical result is less than the laboratory's MDL (below detection level).
NODI(Q): equal to or above the MDL, but less than the ML or PQL. (Refer to Attachment 6 for MDLs or PQLs).

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NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

CAG280000	003
PERMIT NO.	DISCHARGE NO.

Approved Form
OMB No. 2000-0015

PLATFORM HIDALGO
LOCATION: 34º 29' 12" , 120º 42' 12"

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From:		14 09 01	To:		14 11 30

WELL TREATMENT, COMPLETION AND WORKOVER FLUIDS (003)
(Commingled with produced water)
NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
		Average	Maximum	Units	Minimum	Average	Maximum	Units			
WELL TREATMENT, COMPLETION AND WORKOVER FLUIDS FLOW 1 September	Sample Measurement		**No Discharge**	Barrels / Job							
	Permit Requirement		Report							1 / job	Estimate
October	Sample Measurement		**No Discharge**	Barrels / Job							
	Permit Requirement		Report							1 / job	Estimate
November	Sample Measurement		**No Discharge**	Barrels / Job							
	Permit Requirement		Report							1 / job	Estimate
WELL TREATMENT, COMPLETION AND WORKOVER FLUIDS 1 OIL AND GREASE											
						MONTHLY AVERAGE	**DAILY MAXIMUM**				
September	Sample Measurement					**No Discharge**	**No Discharge**	mg/L			
	Permit Requirement					29.0	42.0			1/job	Grab
October	Sample Measurement					**No Discharge**	**No Discharge**	mg/L			
	Permit Requirement					29.0	42.0			1/job	Grab
November	Sample Measurement					**No Discharge**	**No Discharge**	mg/L			
	Permit Requirement					29.0	42.0			1/job	Grab

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER			TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	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. SEE 18 U.S.C. & 1001 AND 33 U.S.C. & 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)	David Rose	(805) 934-8220	12 22 2014
TYPED OR PRINTED		Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

WTCF are injected or comminged with produced water, when present (refer to produced water monitoring requirements).
N / A: Refers to the presence of WTCF discharge with produced water for a given month.

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

CAG280000	003
PERMIT NO.	DISCHARGE NO.

Approved Form
OMB No. 2000-0015

PLATFORM HIDALGO
LOCATION: 34º 29' 12" , 120º 42' 12"

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From:		14 09 01	To:		14 11 30

WELL TREATMENT, COMPLETION AND WORKOVER FLUIDS (003)
(Commingled with produced water)
NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
		Average	Maximum	Units	Minimum	Average	Maximum	Units			
WELL TREATMENT, COMPLETION AND WORKOVER FLUIDS TOTAL NUMBER AND TYPE OF JOBS	Sample Measurement		0	Number of Jobs							
	Permit Requirement		Report								
WELL TREATMENT, COMPLETION AND WORKOVER FLUIDS STATIC SHEEN September	Sample Measurement				No Discharge			# Times Sheen Observed			
	Permit Requirement				Negative Static Sheen Test - # Times observed-None					1/discharge	Grab
WELL TREATMENT, COMPLETION AND WORKOVER FLUIDS STATIC SHEEN October	Sample Measurement				No Discharge			# Times Sheen Observed			
	Permit Requirement				Negative Static Sheen Test - # Times observed-None					1/discharge	Grab
WELL TREATMENT, COMPLETION AND WORKOVER FLUIDS STATIC SHEEN November	Sample Measurement				No Discharge			# Times Sheen Observed			
	Permit Requirement				Negative Static Sheen Test - # Times observed-None					1/discharge	Grab
WELL TREATMENT, COMPLETION AND WORKOVER FLUIDS Chemical Inventory September - November	Sample Measurement				N / A						
	Permit Requirement				Report					1/job	Report

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER			TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	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. SEE 18 U.S.C. & 1001 AND 33 U.S.C. & 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)		(805) 934-8220	12 22 2014
TYPED OR PRINTED		Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

WTCF are injected or comminged with produced water, when present (refer to produced water monitoring requirements).
N / A: No WTCF this quarter.

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

CAG280000	004
PERMIT NO.	DISCHARGE NO.

Approved Form
OMB No. 2000-0015

DECK DRAINAGE (004)

PLATFORM HIDALGO
LOCATION: 34º 29' 12" , 120º 42' 12"

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From:	14	09 01	To:	14	11 30

NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
			Average	Units	Minimum	Average	Maximum	Units			
DECK DRAINAGE VOLUME-FLOW RATE	Sample Measurement		5.8	Mo. Avg. bbl/day					0	1/month	Estimate
September	Permit Requirement		Report							1/month	Estimate
	Sample Measurement		6.0	Mo. Avg. bbl/day					0	1/month	Estimate
October	Permit Requirement		Report							1/month	Estimate
	Sample Measurement		6.0	Mo. Avg. bbl/day					0	1/month	Estimate
November	Permit Requirement		Report							1/month	Estimate
DECK DRAINAGE FREE OIL	Sample Measurement		0	# Days Sheen Observed	No free oil/visual sheen on the receiving water.				0	1/day	Visual - Daylight
September	Permit Requirement		0		No free oil/visual sheen on the receiving water.					1/day	Visual - Daylight
	Sample Measurement		0	# Days Sheen Observed	No free oil/visual sheen on the receiving water.				0	1/day	Visual - Daylight
October	Permit Requirement		0		No free oil/visual sheen on the receiving water.					1/day	Visual - Daylight
	Sample Measurement		0	# Days Sheen Observed	No free oil/visual sheen on the receiving water.				0	1/day	Visual - Daylight
November	Permit Requirement		0		No free oil/visual sheen on the receiving water.					1/day	Visual - Daylight

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	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. SEE 18 U.S.C. & 1001 AND 33 U.S.C. & 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)	(805) 934-8220	12 22 2014
TYPED OR PRINTED	Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

CAG280000	005
PERMIT NO.	DISCHARGE NO.

Approved Form
OMB No. 2000-0015

PLATFORM HIDALGO
LOCATION: 34º 29' 12" , 120º 42' 12"

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From:	14	09 01	To:	14	11 30

SANITARY & DOMESTIC WASTES (005)
(Commingled)

NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
		Average	Maximum	Units	Minimum	Average	Maximum	Units			
SANITARY & DOMESTIC WASTES FLOW RATE (Commingled) September	Sample Measurement	42.0		Monthly Average bbl/day					0	1/day	Estimate
	Permit Requirement	Report								1/month	Estimate
October	Sample Measurement	40.0		Monthly Average bbl/day					0	1/day	Estimate
	Permit Requirement	Report								1/month	Estimate
November	Sample Measurement	47.0		Monthly Average bbl/day					0	1/day	Estimate
	Permit Requirement	Report								1/month	Estimate
SANITARY & DOMESTIC WASTES FOAM & FLOATING SOLIDS (Commingled) September	Sample Measurement		0	# days observed	No foam or floating solids in the receiving waters.				0	1/day	Visual - Daylight
	Permit Requirement		0		No foam or floating solids in the receiving waters.					1/day	Visual - Daylight
October	Sample Measurement		0	# days observed	No foam or floating solids in the receiving waters.				0	1/day	Visual - Daylight
	Permit Requirement		0		No foam or floating solids in the receiving waters.					1/day	Visual - Daylight
November	Sample Measurement		0	# days observed	No foam or floating solids in the receiving waters.				0	1/day	Visual - Daylight
	Permit Requirement		0		No foam or floating solids in the receiving waters.					1/day	Visual - Daylight

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	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. SEE 18 U.S.C. & 1001 AND 33 U.S.C. & 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)	David Rose	(805) 934-8220	12 22 2014
TYPED OR PRINTED		Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

CAG280000	005
PERMIT NO.	DISCHARGE NO.

Approved Form
OMB No. 2000-0015

PLATFORM HIDALGO
LOCATION: 34º 29' 12" , 120º 42' 12"

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From:	14	09 01	To:	14	11 30

SANITARY & DOMESTIC WASTES (005)
(Commingled)

NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
		Average	Maximum	Units	Minimum	Average	Maximum	Units			
SANITARY / DOMESTIC WASTE RESIDUAL CHLORINE [1] (Commingled) September	Sample Measurement				N / A	N / A	N / A	mg/l	0		
	Permit Requirement				1 mg/l	N / A	10 mg/l			Monthly	Grab
October	Sample Measurement				N / A	N / A	N / A	mg/l	0		
	Permit Requirement				1 mg/l	N / A	10 mg/l			Monthly	Grab
November	Sample Measurement				N / A	N / A	N / A	mg/l	0		
	Permit Requirement				1 mg/l	N / A	10 mg/l			Monthly	Grab
DOMESTIC WASTE FOAM [2] (Commingled with Sanitary) September	Sample Measurement	N / A	N / A	# days observed							
	Permit Requirement	None	None							1/month	Estimate
October	Sample Measurement	N / A	N / A	# days observed							
	Permit Requirement	None	None							1/month	Estimate
November	Sample Measurement	N / A	N / A	# days observed							
	Permit Requirement	None	None							1/month	Estimate

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER			TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	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. SEE 18 U.S.C. & 1001 AND 33 U.S.C. & 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)	David Rose	(805) 934-8220	12 22 2014
TYPED OR PRINTED		Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

[1] The sewage treatment unit is a marine sanitation device that complies with pollution control standards and regulations under Section 312 of the Clean Water Act. Thus, it is deemed to be in compliance with permit limitations for sanitary waste discharges (as per Condition II.E.1 Footnote 2 of CAG280000)

[2] Reported with sanitary discharges.

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

CAG280000	008
PERMIT NO.	DISCHARGE NO.

Approved Form
OMB No. 2000-0015

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From:	14	09 01	To:	14	11 30

PLATFORM HIDALGO
LOCATION: 34º 29' 12" , 120º 42' 12"

FIRE CONTROL WATER (008)
(Deluge commingled with deck drains)

NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
			Average	Units	Minimum	Average	Maximum	Units			
FIRE CONTROL SYSTEM TEST WATER[1] (008) - FOAM, FLOATING SOLIDS	Sample Measurement		0	# Days Observed	No floating solids in the receiving water. No foam in the receiving water.				0	1/day	Visual - Daylight
September	Permit Requirement		None		No floating solids in the receiving water. No foam in the receiving water.					1/day	Visual - Daylight
	Sample Measurement		0	# Days Observed	No floating solids in the receiving water. No foam in the receiving water.				0	1/day	Visual - Daylight
October	Permit Requirement		None		No floating solids in the receiving water. No foam in the receiving water.					1/day	Visual - Daylight
	Sample Measurement		0	# Days Observed	No floating solids in the receiving water. No foam in the receiving water.				0	1/day	Visual - Daylight
November	Permit Requirement		None		No floating solids in the receiving water. No foam in the receiving water.					1/day	Visual - Daylight
						Monthly Average	Daily Maximum				
FIRE CONTROL SYSTEM TEST WATER (008) CHLORINE[1,2]	Sample Measurement					0.00139	0.00139	mg/L	0	1/quarter	Grab
September	Permit Requirement					0.0057	0.0114			1/quarter	Grab
	Sample Measurement					N / A	N / A				
October	Permit Requirement					0.0057	0.0114			1/quarter	Grab
	Sample Measurement					N / A	N / A				
November	Permit Requirement					0.0057	0.0114			1/quarter	Grab

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER			TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	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. SEE 18 U.S.C. & 1001 AND 33 U.S.C. & 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)		(805) 934-8220	12 22 2014
TYPED OR PRINTED		Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

[1] Firewater discharges are infrequent and daily receiving water visual observations have shown no foam or floating solids.

[2] Chlorine values reported above are post-dilution per EPA Plumes UM. Chlorine limits are post-dilution as listed in the permit, Appendix C (end-of-pipe and post-dilution values are inclu on Attachment 3).

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

CAG280000	009
PERMIT NO.	DISCHARGE NO.

Approved Form
OMB No. 2000-0015

FIRE CONTROL WATER (008)
(Deluge commingled with deck drains)
NON-CONTACT COOLING WATER (009)

PLATFORM HIDALGO
LOCATION: 34º 29' 12" , 120º 42' 12"

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From:	14	09 01	To:	14	11 30

NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
			Average	Units	Minimum	Average	Maximum	Units			
FIRE CONTROL SYSTEM TEST WATER (008) - CHEMICAL INVENTORY	Sample Measurement				See Attachment #2 Chemical Inventory				0	1/month	List
September - November	Permit Requirement				Report					1/month	List
NON-CONTACT COOLING WATER (009) - FLOW VOLUME	Sample Measurement		102,857	Barrels/ Day					0	1/month	Estimate
September	Permit Requirement		Report							1/month	Estimate
	Sample Measurement		102,857	Barrels/ Day					0	1/month	Estimate
October	Permit Requirement		Report							1/month	Estimate
	Sample Measurement		102,857	Barrels/ Day					0	1/month	Estimate
November	Permit Requirement		Report							1/month	Estimate
NON-CONTACT COOLING WATER (009) - FOAM FLOATING SOLIDS	Sample Measurement		0	# Days Observed	No floating solids in the receiving water. No foam in the receiving water.				0	1/day	Visual - Daylight
September	Permit Requirement		None		No floating solids in the receiving water. No foam in the receiving water.					1/day	Visual - Daylight
	Sample Measurement		0	# Days Observed	No floating solids in the receiving water. No foam in the receiving water.				0	1/day	Visual - Daylight
October	Permit Requirement		None		No floating solids in the receiving water. No foam in the receiving water.					1/day	Visual - Daylight
	Sample Measurement		0	# Days Observed	No floating solids in the receiving water. No foam in the receiving water.				0	1/day	Visual - Daylight
November	Permit Requirement		None		No floating solids in the receiving water. No foam in the receiving water.					1/day	Visual - Daylight

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER			TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	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. SEE 18 U.S.C. & 1001 AND 33 U.S.C. & 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)		(805) 934-8220	12 22 2014
TYPED OR PRINTED		Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

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Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

CAG280000	009
PERMIT NO.	DISCHARGE NO.

Approved Form
OMB No. 2000-0015

NON-CONTACT COOLING WATER (009)

PLATFORM HIDALGO
LOCATION: 34º 29' 12" , 120º 42' 12"

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From:	14	09 01	To:	14	11 30

NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
			Average	Units	Minimum	Monthly Average	Daily Maximum	Units			
NON-CONTACT COOLING WATER (009) ANNUAL CHLORINE[1]	Sample Measurement					N / A	N / A	mg/L			
	Permit Requirement					N / A	N / A			1/year	Grab
NON-CONTACT COOLING WATER (009) CHEMICAL INVENTORY September - November	Sample Measurement				See Attachment #2 Chemical Inventory				0	1/month	List
	Permit Requirement				Report					1/month	List

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER			TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	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. SEE 18 U.S.C. & 1001 AND 33 U.S.C. & 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)	David Rose	(805) 934-8220	12 22 2014
TYPED OR PRINTED		Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

[1] Chlorine values reported above are post-dilution per EPA Plumes UM (end-of-pipe and post-dilution values are included on Attachment 4).
N / A: There is no limit in the permit, Appendix C. The annual chlorine sampling was completed in March 2014 and the result was reported in a previous DMR.

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT

CAG280000	019
PERMIT NO.	DISCHARGE NO.

Approved Form
OMB No. 2000-0015

PLATFORM HIDALGO
LOCATION: 34º 29' 12" , 120º 42' 12"

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From:	14	09 01	To:	14	11 30

EXCESS CEMENT SLURRY (019)

NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
			Average	Units	Minimum	Average	Maximum	Units			
EXCESS CEMENT SLURRY (019) FLOW VOLUME	Sample Measurement		No Discharge	Monthly Average bbl/day							
September	Permit Requirement		Report							1/month	Estimate
	Sample Measurement		No Discharge	Monthly Average bbl/day							
October	Permit Requirement		Report							1/month	Estimate
	Sample Measurement		No Discharge	Monthly Average bbl/day							
November	Permit Requirement		Report							1/month	Estimate
EXCESS CEMENT SLURRY ANNUAL CUMULATIVE VOLUME 1	Sample Measurement		0	Barrels/ Year					0	1/year	Estimate
03/01/14 - 02/28/15	Permit 1 Requirement		2,000							1/year	Estimate
EXCESS CEMENT SLURRY SHEEN TEST/FREE OIL FOAM, FLOATING SOLIDS	Sample Measurement		No Discharge	# Days Sheen Observed	No Discharge						
September	Permit Requirement		None		No foam or floating solids No Oil					1/well 1/day	Visual Rec. Water
	Sample Measurement		No Discharge	# Days Sheen Observed	No Discharge						
October	Permit Requirement		None		No foam or floating solids No Oil					1/well 1/day	Visual Rec. Water
	Sample Measurement		No Discharge	# Days Sheen Observed	No Discharge						
November	Permit Requirement		None		No foam or floating solids No Oil					1/well 1/day	Visual Rec. Water

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER			TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	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. SEE 18 U.S.C. & 1001 AND 33 U.S.C. & 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)	David Rose	(805) 934-8220	12 22 2014
TYPED OR PRINTED		Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

Annual cumulative volume limit is applied to the cumulative volumes for the period of March 2014 through February 2015.

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT

(2-16)

CAG280000	006,007,010,011,012,013,014
PERMIT NO.	DISCHARGE NO.

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From:	14	09 01	To:	14	11 30

Approved Form
OMB No. 2000-0015

Blowout Preventer Fluids
Desalination Unit
Ballast/Storage Displacement
Bilge Water
Boiler Blowdown
Test Fluids
Diatomaceous Earth Filter Media

NOTE: Read instructions before completing this form.

PLATFORM HIDALGO
LOCATION: 34º 29' 12" , 120º 42' 12"

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type (69-70)
		Average	Maximum	Units	Minimum	Average	Maximum	Units			
(006) Blowout Preventer Fluids	Sample Measurement				No Discharge						
FREE OIL, FOAM, FLOATING SOLIDS	Permit Requirement				No free oil or floating solids in the receiving water. No foam, in other than trace amounts, in the receiving water.					1/month 1/discharge	Visual Rec. Water
September - November											
(007) Desalination Unit	Sample Measurement				No floating solids in the receiving water. No foam, in other than trace amounts, in the receiving water.				0	1/day 1/discharge	Visual Rec. Water
FOAM, FLOATING SOLIDS	Permit Requirement				No floating solids in the receiving water. No foam, in other than trace amounts, in the receiving water.					1/month 1/discharge	Visual Rec. Water
September - November											
(010) Ballast/Storage Displacement	Sample Measurement	No Discharge			No Discharge						
Water - FLOW RATE				Monthly							
FREE OIL, FOAM, FLOATING SOLIDS	Permit Requirement	Report		Average bbl/day	No free oil or floating solids in the receiving water. No foam, in other than trace amounts, in the receiving water.					1/month 1/discharge	Estimate / Visual Daylight
September - November											
(011) Bilge Water	Sample Measurement	No Discharge			No Discharge						
FLOW RATE				Monthly							
	Permit Requirement	Report		Average bbl/day	No free oil or floating solids in the receiving water. No foam, in other than trace amounts, in the receiving water.					1/month 1/discharge	Estimate
September - November											
(012) Boiler Blowdown	Sample Measurement				No Discharge						
FOAM, FLOATING SOLIDS	Permit Requirement				No floating solids in the receiving water. No foam, in other than trace amounts, in the receiving water.					1/month 1/discharge	Visual Rec. Water
September - November											
(013) Test Fluids *	Sample Measurement	No Discharge			No Discharge						
FLOW RATE				Monthly							
FREE OIL, FOAM, FLOATING SOLIDS	Permit Requirement	Report		Average bbl/day	No free oil or floating solids in the receiving water. No foam, in other than trace amounts, in the receiving water.					1/month 1/discharge	Estimate / Visual Daylight
September - November											
(014) Diatomaceous Earth Filter Media	Sample Measurement				No Discharge						
FREE OIL, FOAM, FLOATING SOLIDS	Permit Requirement				No free oil or floating solids in the receiving water. No foam, in other than trace amounts, in the receiving water.					1/month 1/discharge	Visual Rec. Water
September - November											

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	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. SEE 18 U.S.C. & 1001 AND 33 U.S.C. & 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)	David Rose	(805) 934-8220	12 22 2014
TYPED OR PRINTED		Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

* See Attachment 2 for Chemical Inventory, if applicable.

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT

Approved Form
OMB No. 2000-0015

CAG280000	015, 016, 017, 018, 020, 021
PERMIT NO.	DISCHARGE NO.

MONITORING PERIOD					
	YR	MO	DAY	YR	MO	DAY
From:	14	09	01	To: 14	11	30

Bulk Water Transfer Overflow
Uncontaminated Water
Water Flooding Discharges
Laboratory Wastes
Muds, Cuttings, Cement at Sea
Hydrotest Water

NOTE: Read instructions before completing this form.

PLATFORM HIDALGO
LOCATION: 34º 29' 12" , 120º 42' 12"

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
			Average	Units	Minimum	Average	Maximum	Units			
(015) Bulk Transfer Water Overflow FOAM, FLOATING SOLIDS	Sample Measurement				No Discharge						
September - November	Permit Requirement				No floating solids in the receiving water. No foam, in other than trace amounts, in the receiving water.					1/month 1/discharge	Visual Rec. Water
(016) Uncontaminated Water FOAM, FLOATING SOLIDS	Sample Measurement				No Discharge						
September - November	Permit Requirement				No free oil or floating solids in the receiving water. No foam, in other than trace amounts, in the receiving water.					1/month 1/discharge	Visual Rec. Water
(017) Water Flooding Discharges FREE OIL, FOAM, FLOATING SOLIDS*	Sample Measurement				No Discharge						
September - November	Permit Requirement				No free oil or floating solids in the receiving water. No foam, in other than trace amounts, in the receiving water.					1/month 1/discharge	Visual Rec. Water
(018) Laboratory Wastes FREE OIL, FOAM, FLOATING SOLIDS	Sample Measurement				N / A (refer to produced water requirements)				0	1/day 1/discharge	Visual Rec. Water
(commingled with produced water) September - November	Permit Requirement				No free oil or floating solids in the receiving water. No foam, in other than trace amounts, in the receiving water.					1/month 1/discharge	Visual Rec. Water
(020) Muds, Cuttings, Cement at Sea Floor FLOOR FREE OIL, FOAM, FLOATING SOLIDS	Sample Measurement				No Discharge						
September - November	Permit Requirement				No free oil or floating solids in the receiving water. No foam, in other than trace amounts, in the receiving water.					1/month 1/discharge	Visual Rec. Water
(021) Hydrotest Water * FLOW RATE / FREE OIL, FOAM FLOATING SOLIDS	Sample Measurement	No Discharge		Monthly Average bbl/day	No Discharge						
September - November	Permit Requirement	Report			No free oil or floating solids in the receiving water. No foam, in other than trace amounts, in the receiving water.					1/month 1/discharge	Estimate / Visual Daylight
(021) HYDROTEST WATER CHLORINE	Sample Measurement					No Discharge	No Discharge	ug/L			
September - November	Permit Requirement					* 7.5	* 13			1/month 1/discharge	Grab

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER			TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	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. SEE 18 U.S.C. & 1001 AND 33 U.S.C. & 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)		(805) 934-8220	12 22 2014
TYPED OR PRINTED		Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

* See Attachment 2 for Chemical Inventory, if applicable.

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT

CAG280000	022
PERMIT NO.	DISCHARGE NO.

Approved Form
OMB No. 2000-0015

PLATFORM HIDALGO
LOCATION: 34º 29' 12" , 120º 42' 12"

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From:	14	09 01	To:	14	11 30

H2S Gas Processing Waste Water
Surfactants, Detergents, Dispersants
NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
		Average	Maximum	Units	Minimum	Average	Maximum	Units			
(022) H2S Gas Processing Waste Water FLOW RATE	Sample Measurement	No Discharge		Monthly Average bbl/day							
September - November	Permit Requirement	Report								1/discharge	Estimate
(022) H2S Gas Processing Waste Water FREE OIL, FOAM, FLOATING SOLIDS	Sample Measurement				No Discharge						
September - November	Permit Requirement				No free oil or floating solids in the receiving water. No foam, in other than trace amounts, in the receiving water.					1/discharge	Visual - Daylight
Surfactants, Detergents, Dispersants	Sample Measurement				Minimized				0		
	Permit Requirement				Minimize						

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER			TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	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. SEE 18 U.S.C. & 1001 AND 33 U.S.C. & 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)		(805) 934-8220	12 22 2014
TYPED OR PRINTED		Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

Attachment 2

Chemical Inventory

ATTACHMENT 2
PLATFORM HIDALGO
MISCELLANEOUS DISCHARGES
CHEMICAL INVENTORY
September 1, 2014 through November 30, 2014

Fluid Type	Volume (Monthly avg bbls per day)	Product Name	Estimated Chemical Quantity [2] (Monthly avg gal per day)	Average End-of-Pipe Concentration (mg/l)
009 Non-contact Cooling Water[2]		Chlorine		
September	102,857		1.08	0.25
October	102,857		1.32	0.31
November	102,857		1.24	0.29
008 Fire Control System Water[1,2]		Chlorine		
September	173		0.0018	0.25
October	203		0.002	0.25
November	300		0.0029	0.23
013 Test Fluids	No Discharge	No Discharge	None	None
017 Water Flooding Discharges	No Discharge	No Discharge	None	None
021 Hydrotest Water	No Discharge	No Discharge	None	None

[1] Firewater volumes are estimated based on one 30 minute test approximately every 4 days (refer to cover letter).

[2] End-of-pipe concentration and chemical quantity calculated with Operations daily monitoring results using a non-EPA chlorine test method (Hach DPD Color Wheel). This method is not an official EPA test method, but using this data better represents the chemical inventory values from month to month since the official EPA test method is required only quarterly or annually.

Attachment 3

Fire Water
Chlorine Residual Results

ATTACHMENT 3
PLATFORM HIDALGO
FIRE WATER CHLORINE RESULTS
September 1, 2014 through November 30, 2014

Discharge	Measurement Frequency	Average Monthly Limit* Post Dilution (mg/l)	Maximum Daily Limit* Post Dilution (mg/l)	Result Post Dilution (mg/l)	End-of-Pipe Concentration (mg/l) EP A Method 330.5	EPA Plumes Dilution
09/10/14						
008 Fire Control System Water Sampled	Once/Quarter	0.0057	0.0114	0.00139	0.24	172:1

* Post-dilution limits are listed in the permit, Appendix C.

Attachment 4

Laboratory reports for Oil and Grease, Chlorine Residuals, and Quarterly NPDES Results

Laboratory Quality Control Reports

LTS ENVIRONMENTAL, INC.

Freeport McMoRan Oil and Gas
201 S. Broadway
Orcutt, Ca 93455

September 29, 2014

Attn: Ruth Juris

Quarterly NPDES chlorine residual on the fire water outlet was as follows:

Sample Date / Time	**Location**	**Total Chlorine Residual** *(EPA Method 330.5)*
	Platform Hidalgo	End of Pipe
September 10, 2014 @ 0645	Firewater Outlet	0.24 mg/l
LTS Meter S/N: 12040E195572 Technician: Mike Apple		Method Blank < 0.05 mg/l (MDL)

S.G. Lawry
Environmental Specialist I LTS

704 Adirondack Ave. • Ventura, Ca 93003 • (805) 644-4560 • Fax (805) 644-4560

LTS ENVIRONMENTAL, INC.

September 8, 2014

Quality Control

As part of the annual in-house quality control chlorine meter check and to ensure proper operation of the meters, LTS Environmental performed a total residual chlorine test with a known value obtained from RT Corporation. Results of this test are as follows:

Test Date	**Total Residual Chlorine**
September 5, 2014	*(EPA Method 330.5)*
LTS meter (SN 041200088375)	**0.57 mg/l**
LTS meter (SN 12040E195572)	**0.52 mg/l**
RT Corporation test sample: (Lot #QC1065-021081)	
Acceptance Limits	**0.481 – 0.835 mg/l**
Certified Value	0.658 mg/l ± 0.0110
	Method Blank < 0.05 mg/l
LTS Lead Technician: Mike Apple	

S.G. Lawry
Environmental Specialist
President, LTS

704 Adirondack Ave. • Ventura, Ca 93003 • (805) 644-4560 • Fax (805) 644-4560

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas
C/O: LTS environmental, Inc.
704 Adirondack Avenue
Ventura, CA 93003
Attn: Steve Lawry

Report Date: September 11, 2014
Laboratory Number: 142281
Project Name: PF Hidalgo Weekly NPDES
Sampled by: Client

On September 5, 2014, Capco Analytical Services, Inc.(CAS), received four(4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
T-31	142281-01
T-31	142281-02*
T-31	142281-03*
T-31	142281-04*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.
Director - Analytical Operations

cc: PF Hidalgo @-Orcutt
Ruth Juris @-EDT
Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.

This report shall not be reproduced except in full without the written approval of CAS. The test results reported represent only the item being tested and may not represent the entire material from which the sample was taken.

CAPCO
Analytical Services, Inc.
Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hidalgo)
CAS LAB NO: 142281
Analyst: GM

Date Sampled: 09/03/14
Date Received: 09/05/14
Date Analyzed: 09/09/14
Sample Matrix: Water

OIL & GREASE ANALYSIS
EPA METHOD 1664

CAS LAB #	Sample ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
142281-01	T-31	13	1	1	5

QUALITY CONTROL DATA

142281-MB	Method Blank	ND	1	1	5

1536 Eastman Ave. Suite B, Ventura, California 93003 Ph: (805)644-1095 FAX: (805)644-9947
www.capcoenv.com

Chain of Custody

142281

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 805-644-4560	**Report to** FM O&G s c/o S. Lawry	**Bill to:** Accounts Payable 700 Milam Ste 3100 Houston, TX, 77002

FACILITY: Hidalgo
COLLECTOR: LTS
PROJECT/CHARGE #: Weekly NPDES
RESULTS REQUIRED: Normal
RESULTS BY: PHONE: _____ FAX: _____

SUBMITTED TO: Capco Analytical Services
REPORT TO: _____ PHONE: _____
COPIES TO: Platform Supervisor, 201 S. Broadway, Orcutt, CA 93455, Ruth Juris — PHONE: 644-4560 — PHONE: _____

9/12

SAMPLE NO.	SAMPLE ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	Pre-serv	ANALYSES REQUESTED (METHOD) 9/15
1	T-31	grab	1	Date: 9-3-14 Time: 1900	HCl	EPA 1664 Abs (9) IR (10)
2		grab	1	1915		
3		grab	1	1930		
4		grab	1	1945		
						Field notes
						Platform coming back from shutdown (Monday 2 - Wednesday 3) due to
						failure of the connector to Glycol system.
						Wednesday 9-3 had additional instrumentation
						issues. NPDES pulled when Ops went back to the ocean.

Comments: **Run #1. Hold rest.**

Relinquished by:		Date: 9-5-14	
Received by:		Time: 955	
Relinquished by:		Date:	
Received by:		Time:	

Relinquished by:		Date:	
Received by:		Time:	
Relinquished by:		Date:	
Received by:		Time:	

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas
C/O: LTS environmental, Inc.
704 Adirondack Avenue
Ventura, CA 93003
Attn: Steve Lawry

Report Date: September 16, 2014
Laboratory Number: 142333
Project Name: PF Hidalgo Weekly NPDES
Sampled by: Client

On September 11, 2014, Capco Analytical Services, Inc.(CAS), received four(4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
T-31	142333-01
T-31	142333-02*
T-31	142333-03*
T-31	142333-04*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.
Director - Analytical Operations

cc: PF Hidalgo @-Orcutt
Ruth Juris @-EDT
Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.

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CAPCO
Analytical Services, Inc.
Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hidalgo)
CAS LAB NO: 142333
Analyst: GM

Date Sampled: 09/09/14
Date Received: 09/11/14
Date Analyzed: 09/15/14
Sample Matrix: Water

OIL & GREASE ANALYSIS
EPA METHOD 1664

CAS LAB #	Sample ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
142333-01	T-31	8.8	1	1	5

QUALITY CONTROL DATA

142333-MB	Method Blank	ND	1	1	5

1536 Eastman Ave. Suite B, Ventura, California 93003 Ph: (805)644-1095 FAX: (805)644-9947
www.capcoenv.com

142333

Chain of Custody

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 805-644-4560	Report to FM O&G s c/o S. Lawry	Bill to: Accounts Payable 700 Milam Ste 3100 Houston, TX, 77002

FACILITY: *Hidalgo*
COLLECTOR: LTS
PROJECT/CHARGE # Weekly NPDES
RESULTS REQUIRED: Normal
RESULTS BY: PHONE: _____ FAX: _____

SUBMITTED TO: *Capco Analytical Services*
REPORT TO: _____ PHONE: _____
COPIES TO: *Platform Supervisor* PHONE: *644-4560*
201 S. Broadway, PHONE: _____
Orcutt, CA 93455
Ruth Juris

9/18 9/19

SAMPLE NO.	SAMPLE ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	Pre-serv	ANALYSES REQUESTED (METHOD)
1	*T-31*	*grab*	*1*	Date: 9/9/14 Time: 1600	*HCl*	*EPA 1664 Abs (11) IR (14)*
2		*grab*	*1*	*1630*		
3		*grab*	*1*	*1700*		
4		*grab*	*1*	*1730*		
						Field notes *Online Hach: 2 2100Q: (1.12).*

Comments: **Run #1. Hold rest.**

Relinquished by: [signature] Date: 9.11.14 Received by: Time: 855	Relinquished by: [signature] Date: 09/11/14 Received by: Time: 8:15
Relinquished by: _____ Date: _____ Received by: Time:	Relinquished by: _____ Date: _____ Received by: Time:

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas
C/O: LTS environmental, Inc.
704 Adirondack Avenue
Ventura, CA 93003
Attn: Steve Lawry

Report Date: September 23, 2014
Laboratory Number: 142385
Project Name: PF Hidalgo Weekly NPDES
Sampled by: Client

On September 18, 2014, Capco Analytical Services, Inc.(CAS), received four(4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
T-31	142385-01
T-31	142385-02*
T-31	142385-03*
T-31	142385-04*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.
Director - Analytical Operations

cc: PF Hidalgo @-Orcutt
Ruth Juris @-EDT
Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.

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CAPCO
Analytical Services, Inc.
Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hidalgo)
CAS LAB NO: 142385
Analyst: GM

Date Sampled: 09/16/14
Date Received: 09/18/14
Date Analyzed: 09/22/14
Sample Matrix: Water

OIL & GREASE ANALYSIS
EPA METHOD 1664

CAS LAB #	Sample ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
142385-01	D.O./NPDES	6.9	1	1	5

QUALITY CONTROL DATA

142385-MB	Method Blank	ND	1	1	5

1536 Eastman Ave. Suite B, Ventura, California 93003 Ph: (805)644-1095 FAX: (805)644-9947
www.capcoenv.com

142385

Chain of Custody

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 805-644-4560	Report to FM O&G s c/o S. Lawry	Bill to: Accounts Payable 700 Milam Ste 3100 Houston, TX, 77002

FACILITY: Hidalgo
COLLECTOR: LTS
PROJECT/CHARGE #: Weekly NPDES
RESULTS REQUIRED: Normal
RESULTS BY: PHONE: _____ FAX: _____

SUBMITTED TO: Capco Analytical Services
REPORT TO: _____ PHONE: _____
COPIES TO: Platform Supervisor PHONE: 644-4560
201 S. Broadway, PHONE: _____
Orcutt, CA 93455
Ruth Juris

9/25 9/26

SAMPLE NO.	SAMPLE ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	Pre-serv	ANALYSES REQUESTED (METHOD)
1	T-31	grab	1	Date: 9/16/14 Time: 2000	HCl	EPA 1664 Abs (07) IR (10)
2		grab	1	2015		
3		grab	1	2030		
4		grab	1	2045		
						Field notes Online Hach: 1 2100Q: 3.45

Comments: **Run #1. Hold rest.**

Relinquished by:	Date: 9-18-14
Received by:	Time: 1400

Relinquished by:	Date: 09/18/14
Received by:	Time:

Relinquished by:	Date:
Received by:	Time:

Relinquished by:	Date:
Received by:	Time:

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas
C/O: LTS environmental, Inc.
704 Adirondack Avenue
Ventura, CA 93003
Attn: Steve Lawry

Report Date: September 30, 2014
Laboratory Number: 142444
Project Name: PF Hidalgo Weekly NPDES
Sampled by: Client

On September 25, 2014, Capco Analytical Services, Inc.(CAS), received four(4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
T-31	142444-01
T-31	142444-02*
T-31	142444-03*
T-31	142444-04*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.
Director - Analytical Operations

cc: PF Hidalgo @-Orcutt
Ruth Juris @-EDT
Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.

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CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hidalgo)
CAS LAB NO: 142444
Analyst: GM

Date Sampled: 09/25/14
Date Received: 09/25/14
Date Analyzed: 09/29/14
Sample Matrix: Water

OIL & GREASE ANALYSIS
EPA METHOD 1664

CAS LAB #	Sample ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
142444-01	T-31	9.7	1	1	5

QUALITY CONTROL DATA

142444-MB	Method Blank	ND	1	1	5

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Chain of Custody

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 805-644-4560	Report to: FM O&G s c/o S. Lawry	Bill to: Accounts Payable 700 Milam Ste 3100 10/2 Houston, TX, 77002

FACILITY: Hidalgo
COLLECTOR: LTS
PROJECT/CHARGE #: Weekly NPDES
RESULTS REQUIRED: Normal
RESULTS BY: PHONE: _____ FAX: _____

SUBMITTED TO: Capco Analytical Services 10/3
REPORT TO: _____ PHONE: _____
COPIES TO: Platform Supervisor PHONE: 644-4560
201 S. Broadway, PHONE: _____
Orcutt, CA 93455
Ruth Juris

SAMPLE NO.	SAMPLE ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	Pre-serv	ANALYSES REQUESTED (METHOD)
1	T-31	grab	1	Date: 9-25-14 Time: 830	HCl	EPA 1664 Abs(12) IR(15) 9 1 2 4 4 4
2		grab	1	845		
3		grab	1	900		
4		grab	1	915		
						Field notes

Comments: **Run #1. Hold rest.**

Relinquished by:	Date: 9-25-14	Relinquished by:	Date:
Received by:	Time: 1525	Received by:	Time:
Relinquished by:	Date:	Relinquished by:	Date:
Received by:	Time:	Received by:	Time:

Prepared for: Freeport-McMoRan Oil & Gas
C/O: LTS environmental, Inc.
704 Adirondack Avenue
Ventura, CA 93003
Attn: Steve Lawry

Report Date: October 3, 2014
Laboratory Number: 142474
Project Name: PF Hidalgo Weekly NPDES
Sampled by: Client

On September 30, 2014, Capco Analytical Services, Inc.(CAS), received four(4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
T-31	142474-01
T-31	142474-02*
T-31	142474-03*
T-31	142474-04*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.
Director - Analytical Operations

cc: PF Hidalgo @-Orcutt
Ruth Juris @-EDT
Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.

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CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hidalgo)
CAS LAB NO: 142474
Analyst: GM

Date Sampled: 09/29/14
Date Received: 09/30/14
Date Analyzed: 10/02/14
Sample Matrix: Water

OIL & GREASE ANALYSIS
EPA METHOD 1664

CAS LAB #	Sample ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
142474-01	T-31	4.6	1	1	5

QUALITY CONTROL DATA

142474-MB	Method Blank	ND	1	1	5

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Chain of Custody

142474

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 805-644-4560	Report to FM O&G s c/o S. Lawry	Bill to: Accounts Payable 700 Milam Ste 3100 Houston, TX, 77002 10/7

FACILITY: Hidalgo
COLLECTOR: LTS
PROJECT/CHARGE #: Weekly NPDES
RESULTS REQUIRED: Normal
RESULTS BY: PHONE: _____ FAX: _____

SUBMITTED TO: Capco Analytical Services 10/8
REPORT TO: _____ PHONE: _____
COPIES TO: Platform Supervisor PHONE: 644-4560
201 S. Broadway, PHONE: _____
Orcutt, CA 93455
Ruth Juris

SAMPLE NO.	SAMPLE ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	Pre-serv	ANALYSES REQUESTED (METHOD)
1	T-31	grab	1	Date: 9-29-14 Time: 1000	HCl	EPA 1664 Abs (21) IR (14)
2		grab	1	1030		
3		grab	1	1100		
4		grab	1	1130		
						Field notes
						8 (online) 6.88 (2100Q)

Comments: **Run #1. Hold rest.**

Relinquished by: [signature] Date: 9-30-12 Received by: Time: 1600	Relinquished by: [signature] Date: 09/30/14 Received by: Time: 3:55 pm
Relinquished by: Date: Received by: Time:	Relinquished by: Date: Received by: Time:

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Analytical Services, Inc.

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Prepared for: Freeport-McMoRan Oil & Gas
C/O: LTS environmental, Inc.
704 Adirondack Avenue
Ventura, CA 93003
Attn: Steve Lawry

Report Date: October 14, 2014
Laboratory Number: 142568
Project Name: PF Hidalgo Weekly NPDES
Sampled by: Client

On October 8, 2014, Capco Analytical Services, Inc.(CAS), received four(4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
T-31	142568-01
T-31	142568-02*
T-31	142568-03*
T-31	142568-04*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.
Director - Analytical Operations

cc: PF Hidalgo @-Orcutt
Ruth Juris @-EDT
Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.

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CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hidalgo)
CAS LAB NO: 142568
Analyst: GM

Date Sampled: 10/07/14
Date Received: 10/08/14
Date Analyzed: 10/10/14
Sample Matrix: Water

OIL & GREASE ANALYSIS
EPA METHOD 1664

CAS LAB #	Sample ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
142568-01	T-31	5.8	1	1	5

QUALITY CONTROL DATA

142568-MB	Method Blank	ND	1	1	5

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Chain of Custody

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 805-644-4560	**Report to:** FM O&G c/o S. Lawry	**Bill to:** Accounts Payable 700 Milam Ste 3100 Houston, TX, 77002 10/15

FACILITY: *Hidalgo*
COLLECTOR: LTS
PROJECT/CHARGE # Weekly NPDES
RESULTS REQUIRED: Normal
RESULTS BY: PHONE: _____ FAX: _____

SUBMITTED TO: *Capco Analytical Services*
REPORT TO: _____ PHONE: _____
COPIES TO: *Platform Supervisor* PHONE: *644-4560*
201 S. Broadway, PHONE: _____
Orcutt, CA 93455
cc: Ruth Juris

SAMPLE NO.	SAMPLE ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	Pre-serv	ANALYSES REQUESTED (METHOD)
1	*T-31*	*grab*	*1*	Date: 10/7/14 Time: 2000	*HCl*	*EPA 1664 Abs (8) IR (11)* 142568
2		*grab*	*1*	*2030*		
3		*grab*	*1*	*2100*		
4		*grab*	*1*	*2130*		
						Field notes *online hach meter: 2.01 2100 Q: 2.07*

Comments: **Run #1, Hold rest**

Relinquished by:	Date: 10-8-14	Relinquished by:	Date:
Received by:	Time: 1515	Received by:	Time:
Relinquished by:	Date:	Relinquished by:	Date:
Received by:	Time:	Received by:	Time:

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Prepared for: Freeport-McMoRan Oil & Gas
C/O: LTS Environmental, Inc.
704 Adirondack Avenue
Ventura, CA 93003
Attn: Steve Lawry

Report Date: October 28, 2014
Laboratory Number: 142679
Project Name: PF Hidalgo Weekly NPDES
Sampled By: Client

On October 21, 2014, Capco Analytical Services, Inc.(CAS), received one(1) sample to be analyzed. The sample was identified and assigned the laboratory ID number listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
T-31	142679-01

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.
Director - Analytical Operations

cc: PF Hidalgo Supervisor
Mike Apple-EDT
Ruth Juris @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.

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CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hidalgo)
CAS LAB NO: 142679
Analyst: GM

Date Sampled: 10/18/14
Date Received: 10/21/14
Date Analyzed: 10/23/14
Sample Matrix: Water

OIL & GREASE ANALYSIS
EPA METHOD 1664

CAS LAB #	Sample ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
142679-01	T-31	13	1	1	5

QUALITY CONTROL DATA

142679-MB	Method Blank	ND	1	1	5

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www.capcoenv.com

142679

Sheet 1

LTS Environmental, Inc 704 Adirondack Avenue Ventura, CA 93003 805-644-4560	Report to: FM O&G ~~1821 Price Canyon Rd.~~ ~~Arroyo Grande, Ca~~	Bill to: Accounts Payable 700 Milam Ste 3100 Houston, Tx 77002

FACILITY: ~~Arroyo Grande / FM O&G~~ Plt. Hidalgo
COLLECTOR: ~~ATM~~ Garrett Swearingin ICS
PROJECT/CHARGE #: ~~ES&H~~ ~~Cost Ctr~~
RESULTS REQUIRED: Hidalgo Weekly NPDES
RESULTS BY: PHONE: FAX:

SUBMITTED TO: Capco Analytical Services
Report To: ~~David Wilbur @~~ ~~Arroyo Grande~~ PHONE: FAX:
Copies To: ~~Rob Hagle~~ PHONE: ~~9348273~~
Steve Lawry - LTS PHONE: ~~6441580~~

142679

SAMPLE NO.	SAMPLE ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	PRESERV.	ANALYSES REQUESTED (METHOD)
1	~~C-5~~ T-31, ~~C-11~~	Grab	1	Date: 10-18-2014 Time: 15:30	NO (HCl)	NTU: 1.28, IR: 13 O&G 1664

Comments:

Relinquished by:	Date: 10-20-14
Received by:	Time: 1450

Relinquished by:	Date: 10-21-14
Received by:	Time: 1020

Relinquished by:	Date:
Received by:	Time:

Relinquished by:	Date:
Received by:	Time:

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Analytical Services, Inc.

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California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas
C/O: LTS environmental, Inc.
704 Adirondack Avenue
Ventura, CA 93003
Attn: Steve Lawry

Report Date: October 28, 2014
Laboratory Number: 142692
Project Name: PF Hidalgo Weekly NPDES
Sampled by: Client

On October 23, 2014, Capco Analytical Services, Inc.(CAS), received four(4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
T-31	142692-01
T-31	142692-02*
T-31	142692-03*
T-31	142692-04*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.
Director - Analytical Operations

cc: PF Hidalgo @-Orcutt
Ruth Juris @-EDT
Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.

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CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hidalgo)
CAS LAB NO: 142692
Analyst: GM

Date Sampled: 10/21/14
Date Received: 10/23/14
Date Analyzed: 10/27/14
Sample Matrix: Water

OIL & GREASE ANALYSIS
EPA METHOD 1664

CAS LAB #	Sample ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
142692-01	T-31	11	1	1	5

QUALITY CONTROL DATA

142692-MB	Method Blank	ND	1	1	5

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Chain of Custody

142692

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 805-644-4560	Report to FM O&G s c/o S. Lawry	Bill to: Accounts Payable 700 Milam Ste 3100 Houston, TX, 77002 10/30

FACILITY: Hidalgo
COLLECTOR: LTS
PROJECT/CHARGE # Weekly NPDES
RESULTS REQUIRED: Normal
RESULTS BY: PHONE: FAX:

SUBMITTED TO: Capco Analytical Services
REPORT TO: PHONE:
COPIES TO: Platform Supervisor PHONE: 644-4560
201 S. Broadway, PHONE:
Orcutt, CA 93455
Ruth Juris 10/31

SAMPLE NO.	SAMPLE ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	Pre-serv	ANALYSES REQUESTED (METHOD)
1	T-31	grab	1	Date: 10/21/14 Time: 1830	HCl	EPA 1664 Abs (10) IR (13)
2		grab	1	1900		
3		grab	1	1930		
4		grab	1	2000		
						Field notes online hach: 7 2100Q: 14.1
						Adjusted skim levels.

Comments: **Run #1. Hold rest.**

Relinquished by:	Date: 10-23-14	Relinquished by:	Date: 10-23-14
Received by:	Time: 1130	Received by:	Time:
Relinquished by:	Date:	Relinquished by:	Date:
Received by:	Time:	Received by:	Time:

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California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas
C/O: LTS environmental, Inc.
704 Adirondack Avenue
Ventura, CA 93003
Attn: Steve Lawry

Report Date: November 6, 2014
Laboratory Number: 142751
Project Name: PF Hidalgo Weekly NPDES
Sampled by: Client

On October 29, 2014, Capco Analytical Services, Inc.(CAS), received four(4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
T-31	142751-01
T-31	142751-02*
T-31	142751-03*
T-31	142751-04*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.
Director - Analytical Operations

cc: PF Hidalgo @-Orcutt
Ruth Juris @-EDT
Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.

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CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hidalgo)
CAS LAB NO: 142751
Analyst: GM

Date Sampled: 10/27/14
Date Received: 10/29/14
Date Analyzed: 11/03/14
Sample Matrix: Water

OIL & GREASE ANALYSIS
EPA METHOD 1664

CAS LAB #	Sample ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
142751-01	T-31	8.7	1	1	5

QUALITY CONTROL DATA

142751-MB	Method Blank	ND	1	1	5

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Chain of Custody

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 805-644-4560	**Report to** FM O&G s c/o S. Lawry	**Bill to:** Accounts Payable 700 Milam Ste 3100 Houston, TX, 77002 11/5

FACILITY: *Hidalgo*
COLLECTOR: LTS
PROJECT/CHARGE # Weekly NPDES
RESULTS REQUIRED: Normal
RESULTS BY: PHONE: _____ FAX: _____

SUBMITTED TO: *Capco Analytical Services* 11/6
REPORT TO: _____ PHONE: _____
COPIES TO: *Platform Supervisor* PHONE: *644-4560*
201 S. Broadway, PHONE: _____
Orcutt, CA 93455
Ruth Juris

SAMPLE NO.	SAMPLE ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	Pre-serv	ANALYSES REQUESTED (METHOD)
1	*T-31*	*grab*	*1*	Date: 10/27/14 Time: 1900	*HCl*	*EPA 1664 Abs(8) IR (11)*
2		*grab*	*1*	*1930*		**142751**
3		*grab*	*1*	*2000*		
4		*grab*	*1*	*2030*		
						Field notes *C-14, 11 and 3 on (only)*
						online hach: 2 2100Q: 1.6

Comments: **Run #1. Hold rest.**

Relinquished by:	Date: 10.29.14	Relinquished by:	Date:
Received by:	Time: 925	Received by:	Time:
Relinquished by:	Date:	Relinquished by:	Date:
Received by:	Time:	Received by:	Time:

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Prepared for: Freeport-McMoRan Oil & Gas
C/O: LTS environmental, Inc.
704 Adirondack Avenue
Ventura, CA 93003
Attn: Steve Lawry

Report Date: November 10, 2014
Laboratory Number: 142850
Project Name: PF Hidalgo Weekly NPDES
Sampled by: Client

On November 7, 2014, Capco Analytical Services, Inc.(CAS), received four(4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
T-31	142850-01
T-31	142850-02*
T-31	142850-03*
T-31	142850-04*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.
Director - Analytical Operations

cc: PF Hidalgo @-Orcutt
Ruth Juris @-EDT
Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.

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California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hidalgo)
CAS LAB NO: 142850
Analyst: GM/MM

Date Sampled: 11/06/14
Date Received: 11/07/14
Date Analyzed: 11/07/14
Sample Matrix: Water

OIL & GREASE ANALYSIS
EPA METHOD 1664

CAS LAB #	Sample ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
142850-01	T-31	4.9	1	1	5

QUALITY CONTROL DATA

142850-MB	Method Blank	ND	1	1	5

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Chain of Custody

142850

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 805-644-4560	**Report to:** FM O&G c/o S. Lawry	**Bill to:** Accounts Payable 700 Milam Ste 3100 Houston, TX, 77002

FACILITY: *Hidalgo*
COLLECTOR: LTS
PROJECT/CHARGE # Weekly NPDES
RESULTS REQUIRED: Normal
RESULTS BY: PHONE: _____ FAX: _____

SUBMITTED TO: *Capco Analytical Services*
REPORT TO: _____ PHONE: _____
COPIES TO: *Platform Supervisor* PHONE: *644-4560*
201 S. Broadway, PHONE: _____
Orcutt, CA 93455
cc: Ruth Juris 11/14 11/17

SAMPLE NO.	SAMPLE ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	Pre-serv	ANALYSES REQUESTED (METHOD)
1	*T-31*	*grab*	*1*	Date: 11/6/14 Time: 900	*HCl*	*EPA 1664 Abs (07), IR (10)*
2		*grab*	*1*	*915*		
3		*grab*	*1*	*930*		
4		*grab*	*1*	*945*		
						field notes: *online Hach (7). 2100Q (1.18). Online hach probably needs*
						calibration per Ops. Re-calibration for hand held:
						18.8 (20), 95.4 (100) 782 (800). 9.46 (10).
						Wells #3, 11, and 14 on(pinched back).

Comments: **Run #1, Hold rest**

Relinquished by:	Date: 11.7.14	Relinquished by:	Date:
Received by:	Time: 1120	Received by:	Time:
Relinquished by:	Date:	Relinquished by:	Date:
Received by:	Time:	Received by:	Time:

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas
C/O: LTS environmental, Inc.
704 Adirondack Avenue
Ventura, CA 93003
Attn: Steve Lawry

Report Date: November 25, 2014
Laboratory Number: 142908
Project Name: PF Hidalgo Weekly NPDES
Sampled by: Client

On November 14, 2014, Capco Analytical Services, Inc.(CAS), received four(4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
T-31	142908-01
T-31	142908-02*
T-31	142908-03*
T-31	142908-04*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.
Director - Analytical Operations

cc: PF Hidalgo @-Orcutt
Ruth Juris @-EDT
Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.

This report shall not be reproduced except in full without the written approval of CAS. The test results reported represent only the item being tested and may not represent the entire material from which the sample was taken.

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CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hidalgo)
CAS LAB NO: 142908
Analyst: MM

Date Sampled: 11/13/14
Date Received: 11/14/14
Date Analyzed: 11/20/14
Sample Matrix: Water

OIL & GREASE ANALYSIS
EPA METHOD 1664

CAS LAB #	Sample ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
142908-01	T-31	4.9	1	1	5

QUALITY CONTROL DATA

142908-MB	Method Blank	ND	1	1	5

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142908

Chain of Custody

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 805-644-4560	Report to FM O&G c/o Steve Lawry	Bill to: Accounts Payable 700 Milam Ste 3100 Houston, TX, 77002 11/24

FACILITY: *Hidalgo*
COLLECTOR: LTS
PROJECT/CHARGE # Weekly NPDES
RESULTS REQUIRED: Normal
RESULTS BY: PHONE: _____ FAX: _____

SUBMITTED TO: *Capco Analytical Services* 11/25
REPORT TO: _____ PHONE: _____
COPIES TO: *Platform Supervisor* PHONE: *644-4560*
201 S. Broadway, PHONE: _____
Orcutt, CA 93455
Ruth Juris

SAMPLE NO.	SAMPLE ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	Pre-serv	ANALYSES REQUESTED (METHOD)
1	T-3#	*grab*	*1*	Date: 11/13/14 Time: 900	*HCl*	*EPA 1664 Abs (07) IR (10)*
2		*grab*	*1*	*930*		
3		*grab*	*1*	*1000*		
4		*grab*	*1*	*1030*		
						Field notes:
						online Hach: (2) 2100Q: 4.04

Comments: **Run #1. Hold #2-4**

Relinquished by:	Date: 11.14.14	Relinquished by:	Date:
Received by:	Time:	Received by:	Time:
Relinquished by:	Date:	Relinquished by:	Date:
Received by:	Time:	Received by:	Time:

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas
C/O: LTS environmental, Inc.
704 Adirondack Avenue
Ventura, CA 93003
Attn: Steve Lawry

Report Date: December 1, 2014
Laboratory Number: 142947
Project Name: PF Hidalgo Weekly NPDES
Sampled by: Client

On November 20, 2014, Capco Analytical Services, Inc.(CAS), received four(4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
T-31	142947-01
T-31	142947-02*
T-31	142947-03*
T-31	142947-04*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.
Director - Analytical Operations

cc: PF Hidalgo @-Orcutt
Ruth Juris @-EDT
Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.

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Analytical Services, Inc.
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California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hidalgo)
CAS LAB NO: 142947
Analyst: ELW

Date Sampled: 11/18/14
Date Received: 11/20/14
Date Analyzed: 11/21/14
Sample Matrix: Water

OIL & GREASE ANALYSIS
EPA METHOD 1664

CAS LAB #	Sample ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
142947-01	T-31	2.0	1	1	5

QUALITY CONTROL DATA

142947-MB	Method Blank	ND	1	1	5

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142947

Chain of Custody

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 805-644-4560	Report to FM O&G s c/o S. Lawry	Bill to: Accounts Payable 700 Milam Ste 3100 Houston, TX, 77002 12/1

FACILITY: *Hidalgo*
COLLECTOR: LTS
PROJECT/CHARGE # Weekly NPDES
RESULTS REQUIRED: Normal
RESULTS BY: PHONE: _____ FAX: _____

SUBMITTED TO: *Capco Analytical Services*
REPORT TO: _____ PHONE: _____
COPIES TO: *Platform Supervisor* PHONE: *644-4560*
201 S. Broadway, PHONE: _____
Orcutt, CA 93455
Ruth Juris

SAMPLE NO.	SAMPLE ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	Pre-serv	ANALYSES REQUESTED (METHOD)
1	*T-31*	*grab*	*1*	Date: 11/18/14 Time: 1900	*HCl*	*EPA 1664 Abs (07) IR (10)*
2		*grab*	*1*	*1915*		
3		*grab*	*1*	*1930*		
4		*grab*	*1*	*1945*		
						Field notes *online Hach: 1.4 2100Q: 1.17*
						Recalibration: 22.1 (20)/ 101 (100)/ 784 (800). 9.59 (10). *IR recalibration: 13 (10)/ 25 (20)/ 33 (30).*

Comments: **Run #1. Hold rest.**

Relinquished by:		Date: 11-20-14	
Received by:		Time: 1620	
Relinquished by:		Date:	
Received by:		Time:	
Relinquished by:		Date:	
Received by:		Time:	
Relinquished by:		Date:	
Received by:		Time:	

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Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas
C/O: LTS environmental, Inc.
704 Adirondack Avenue
Ventura, CA 93003
Attn: Steve Lawry

Report Date: December 5, 2014
Laboratory Number: 142996
Project Name: PF Hidalgo Weekly NPDES
Sampled by: Client

On November 26, 2014, Capco Analytical Services, Inc.(CAS), received four(4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
T-31	142996-01
T-31	142996-02*
T-31	142996-03*
T-31	142996-04*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.
Director - Analytical Operations

cc: PF Hidalgo @-Orcutt
Ruth Juris @-EDT
Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.

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Analytical Services, Inc.
Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hidalgo)
CAS LAB NO: 142996
Analyst: ELW

Date Sampled: 11/25/14
Date Received: 11/26/14
Date Analyzed: 12/03/14
Sample Matrix: Water

OIL & GREASE ANALYSIS
EPA METHOD 1664

CAS LAB #	Sample ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
142996-01	T-31	16.2	1	1	5

QUALITY CONTROL DATA

142996-MB	Method Blank	ND	1	1	5

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Chain of Custody

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 805-644-4560	**Report to:** FM O&G c/o S. Lawry	**Bill to:** Accounts Payable 700 Milam Ste 3100 Houston, TX, 77002

FACILITY: *Hidalgo*
COLLECTOR: LTS
PROJECT/CHARGE # Weekly NPDES
RESULTS REQUIRED: Normal
RESULTS BY: PHONE: _____ FAX: _____

SUBMITTED TO: *Capco Analytical Services*
REPORT TO: _____ PHONE: _____
COPIES TO: *Platform Supervisor* PHONE: *644-4560*
201 S. Broadway, PHONE: _____
Orcutt, CA 93455
cc: Ruth Juris

12/5
14 2996

SAMPLE NO.	SAMPLE ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	Pre-serv	ANALYSES REQUESTED (METHOD)
1	*T-31*	*grab*	*1*	Date: 11/25/14 Time: 1300	*HCl*	*EPA 1664 Abs (14) IR (17)*
2		*grab*	*1*	*1330*		
3		*grab*	*1*	*1400*		
4		*grab*	*1*	*1430*		
						Field notes: *online Hach: 6.9 2100Q: 10.2*
						- spike samples (>100 ppm)
						did not collect (process issues -
						ops persuaded me to avoid it).

Comments: **Run #1, Hold rest**

Relinquished by:		Date: 11-26-14	Relinquished by:	Date:
Received by:		Time: 1045	Received by:	Time:
Relinquished by:		Date:	Relinquished by:	Date:
Received by:		Time:	Received by:	Time:

aquatic bioassay & consulting laboratories, inc

September 29, 2014

Freeport -McMoRan Oil & Gas
Attn: Ruth Juris
201 S. Broadway
Orcutt, CA 93455

Dear Ms. Juris:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms EPA/600/R-95-136, 1995* "All acceptability criteria were met. This is a valid test." Results were as follows:

CLIENT:	Freeport -McMoRan Oil & Gas
SAMPLE I.D.:	Produced Water Discharge (Platform Hidalgo)
DATE RECEIVED:	11 Sept - 14
ABC LAB. NO.:	LTS0914.072

CHRONIC TOPSMELT SURVIVAL & GROWTH BIOASSAY

IWC CONCENTRATION = 0.0247 %

TST RESULT

SURVIVAL	PASS
GROWTH	PASS

Yours very truly,

Scott Johnson
Laboratory Director

CETIS Summary Report

Report Date: 29 Sep-14 12:13 (p 1 of 2)
Test Code: LTS0914.072tops | 08-9759-2229

Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Batch ID:	03-9878-0036	**Test Type:**	Growth-Survival (7d)	**Analyst:**	
Start Date:	11 Sep-14 16:50	**Protocol:**	EPA/600/R-95/136 (1995)	**Diluent:**	Laboratory Seawater
Ending Date:	18 Sep-14 14:50	**Species:**	Atherinops affinis	**Brine:**	Not Applicable
Duration:	6d 22h	**Source:**	Aquatic Biosystems, CO	**Age:**	

Sample ID:	00-8547-0468	**Code:**	LTS0914.072tops	**Client:**	LTS Environmental, Inc.
Sample Date:	10 Sep-14 13:00	**Material:**	Sample Water	**Project:**	
Receive Date:	11 Sep-14 08:10	**Source:**	Bioassay Report		
Sample Age:	28h (5.6 °C)	**Station:**	Produced Water Discharge (Platform Hidalg		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
20-1164-2186	7d Survival Rate	0.037	>0.037	NA	7.96%	2703	Steel Many-One Rank Sum Test
17-6769-7661	Mean Dry Biomass-mg	0.037	>0.037	NA	25.2%	2703	Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
07-1563-3212	7d Survival Rate	EC5	>0.037	N/A	N/A	<2703	Linear Interpolation (ICPIN)
		EC10	>0.037	N/A	N/A	<2703	
		EC15	>0.037	N/A	N/A	<2703	
		EC20	>0.037	N/A	N/A	<2703	
		EC25	>0.037	N/A	N/A	<2703	
		EC40	>0.037	N/A	N/A	<2703	
		EC50	>0.037	N/A	N/A	<2703	
11-3474-4209	Mean Dry Biomass-mg	IC5	>0.037	N/A	N/A	<2703	Linear Interpolation (ICPIN)
		IC10	>0.037	N/A	N/A	<2703	
		IC15	>0.037	N/A	N/A	<2703	
		IC20	>0.037	N/A	N/A	<2703	
		IC25	>0.037	N/A	N/A	<2703	
		IC40	>0.037	N/A	N/A	<2703	
		IC50	>0.037	N/A	N/A	<2703	

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
07-1563-3212	7d Survival Rate	Control Resp	0.96	0.8 - NL	Yes	Passes Acceptability Criteria
20-1164-2186	7d Survival Rate	Control Resp	0.96	0.8 - NL	Yes	Passes Acceptability Criteria
11-3474-4209	Mean Dry Biomass-mg	Control Resp	1.27	0.85 - NL	Yes	Passes Acceptability Criteria
17-6769-7661	Mean Dry Biomass-mg	Control Resp	1.27	0.85 - NL	Yes	Passes Acceptability Criteria
20-1164-2186	7d Survival Rate	PMSD	0.07957	NL - 0.25	No	Passes Acceptability Criteria
17-6769-7661	Mean Dry Biomass-mg	PMSD	0.2517	NL - 0.5	No	Passes Acceptability Criteria

7d Survival Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	0.96	0.8489	1	0.8	1	0.04	0.08944	9.32%	0.0%
0.0123		5	1	1	1	1	1	0	0	0.0%	-4.17%
0.0247		5	1	1	1	1	1	0	0	0.0%	-4.17%
0.037		5	1	1	1	1	1	0	0	0.0%	-4.17%

Mean Dry Biomass-mg Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	1.27	0.8916	1.648	0.77	1.552	0.1363	0.3048	24.0%	0.0%
0.0123		5	1.084	0.8271	1.341	0.888	1.344	0.09254	0.2069	19.09%	14.65%
0.0247		5	1.278	1.068	1.487	1.12	1.56	0.07542	0.1686	13.2%	-0.6%
0.037		5	1.267	1.013	1.521	1.102	1.616	0.09149	0.2046	16.14%	0.22%

7d Survival Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1	0.8	1	1	1
0.0123		1	1	1	1	1
0.0247		1	1	1	1	1
0.037		1	1	1	1	1

Mean Dry Biomass-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.234	0.77	1.462	1.552	1.332
0.0123		0.888	0.9	1.254	1.034	1.344
0.0247		1.56	1.286	1.2	1.12	1.222
0.037		1.252	1.616	1.138	1.228	1.102

7d Survival Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	5/5	4/5	5/5	5/5	5/5
0.0123		5/5	5/5	5/5	5/5	5/5
0.0247		5/5	5/5	5/5	5/5	5/5
0.037		5/5	5/5	5/5	5/5	5/5

CETIS Analytical Report

Report Date: 29 Sep-14 12:13 (p 1 of 4)
Test Code: LTS0914.072tops | 08-9759-2229

Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	20-1164-2186	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	29 Sep-14 12:13	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Sample ID:	00-8547-0468	**Code:**	LTS0914.072tops	**Client:**	LTS Environmental, Inc.
Sample Date:	10 Sep-14 13:00	**Material:**	Sample Water	**Project:**	
Receive Date:	11 Sep-14 08:10	**Source:**	Bioassay Report		
Sample Age:	28h (5.6 °C)	**Station:**	Produced Water Discharge (Platform Hidalg		

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA	7.96%	0.037	>0.037	NA	2703

Steel Many-One Rank Sum Test

Control	vs	C-%	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Negative Control		0.0123	30	17	1	8	0.8988	Asymp	Non-Significant Effect
		0.0247	30	17	1	8	0.8988	Asymp	Non-Significant Effect
		0.037	30	17	1	8	0.8988	Asymp	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.008506184	0.002835395	3	1	0.4182	Non-Significant Effect
Error	0.04536632	0.002835395	16			
Total	0.0538725		19			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	1	5.953	0.4262	Equal Variances
Variances	Levene Equality of Variance	7.111	5.292	0.0030	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.4969	0.866	<0.0001	Non-normal Distribution
Distribution	Kolmogorov-Smirnov D	0.45	0.2235	<0.0001	Non-normal Distribution
Distribution	D'Agostino Skewness	4.576	2.576	<0.0001	Non-normal Distribution
Distribution	D'Agostino Kurtosis	4.175	2.576	<0.0001	Non-normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	38.38	9.21	<0.0001	Non-normal Distribution
Distribution	Anderson-Darling A2 Normality	4.585	3.878	<0.0001	Non-normal Distribution

7d Survival Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	5	0.96	0.8489	1	1	0.8	1	0.04	9.32%	0.0%
0.0123		5	1	1	1	1	1	1	0	0.0%	-4.17%
0.0247		5	1	1	1	1	1	1	0	0.0%	-4.17%
0.037		5	1	1	1	1	1	1	0	0.0%	-4.17%

Angular (Corrected) Transformed Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Contr	5	1.298	1.165	1.43	1.345	1.107	1.345	0.04763	8.21%	0.0%
0.0123		5	1.345	1.345	1.346	1.345	1.345	1.345	0	0.0%	-3.67%
0.0247		5	1.345	1.345	1.346	1.345	1.345	1.345	0	0.0%	-3.67%
0.037		5	1.345	1.345	1.346	1.345	1.345	1.345	0	0.0%	-3.67%

7d Survival Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1	0.8	1	1	1
0.0123		1	1	1	1	1
0.0247		1	1	1	1	1
0.037		1	1	1	1	1

Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	20-1164-2186	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	29 Sep-14 12:13	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

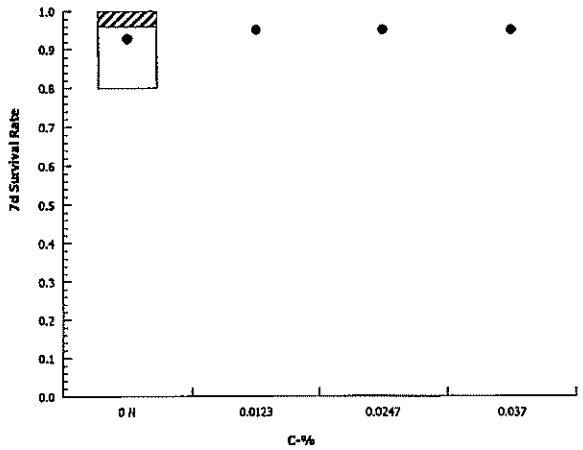
Angular (Corrected) Transformed Detail

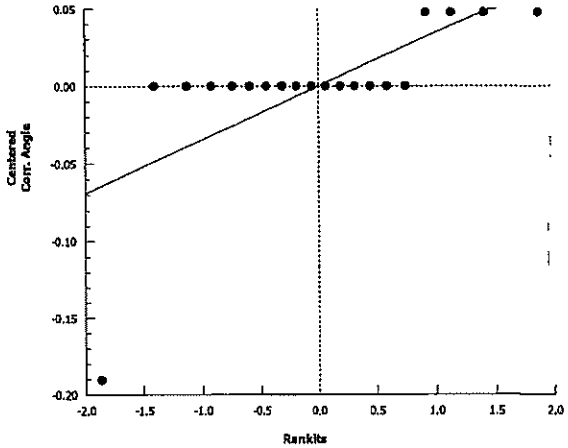
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.345	1.107	1.345	1.345	1.345
0.0123		1.345	1.345	1.345	1.345	1.345
0.0247		1.345	1.345	1.345	1.345	1.345
0.037		1.345	1.345	1.345	1.345	1.345

7d Survival Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	5/5	4/5	5/5	5/5	5/5
0.0123		5/5	5/5	5/5	5/5	5/5
0.0247		5/5	5/5	5/5	5/5	5/5
0.037		5/5	5/5	5/5	5/5	5/5

Graphics





Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	17-6769-7661	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.7
Analyzed:	29 Sep-14 12:13	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Sample ID:	00-8547-0468	**Code:**	LTS0914.072tops	**Client:**	LTS Environmental, Inc.
Sample Date:	10 Sep-14 13:00	**Material:**	Sample Water	**Project:**	
Receive Date:	11 Sep-14 08:10	**Source:**	Bioassay Report		
Sample Age:	28h (5.6 °C)	**Station:**	Produced Water Discharge (Platform Hidalg		

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	25.2%	0.037	>0.037	NA	2703

Dunnett Multiple Comparison Test

Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Negative Control		0.0123	1.296	2.227	0.32	8	0.2276	CDF	Non-Significant Effect
		0.0247	-0.05295	2.227	0.32	8	0.7686	CDF	Non-Significant Effect
		0.037	0.01951	2.227	0.32	8	0.7430	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.1322662	0.04408874	3	0.8561	0.4837	Non-Significant Effect
Error	0.823984	0.051499	16			
Total	0.9562503		19			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	1.434	11.34	0.6975	Equal Variances
Variances	Mod Levene Equality of Variance	0.466	5.953	0.7114	Equal Variances
Variances	Levene Equality of Variance	0.5148	5.292	0.6779	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9454	0.866	0.3023	Normal Distribution
Distribution	Kolmogorov-Smirnov D	0.1339	0.2235	0.4630	Normal Distribution
Distribution	D'Agostino Skewness	0.4421	2.576	0.6584	Normal Distribution
Distribution	D'Agostino Kurtosis	0.5801	2.576	0.5618	Normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	0.532	9.21	0.7664	Normal Distribution
Distribution	Anderson-Darling A2 Normality	0.523	3.878	0.1868	Normal Distribution

Mean Dry Biomass-mg Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	5	1.27	0.8916	1.648	1.332	0.77	1.552	0.1363	24.0%	0.0%
0.0123		5	1.084	0.8271	1.341	1.034	0.888	1.344	0.09254	19.09%	14.65%
0.0247		5	1.278	1.068	1.487	1.222	1.12	1.56	0.07542	13.2%	-0.6%
0.037		5	1.267	1.013	1.521	1.228	1.102	1.616	0.09149	16.14%	0.22%

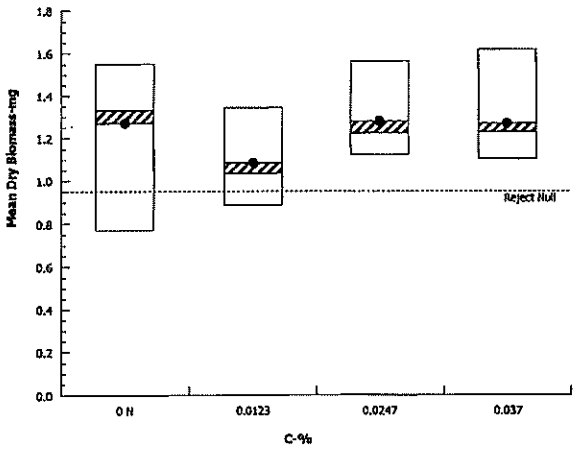
Mean Dry Biomass-mg Detail

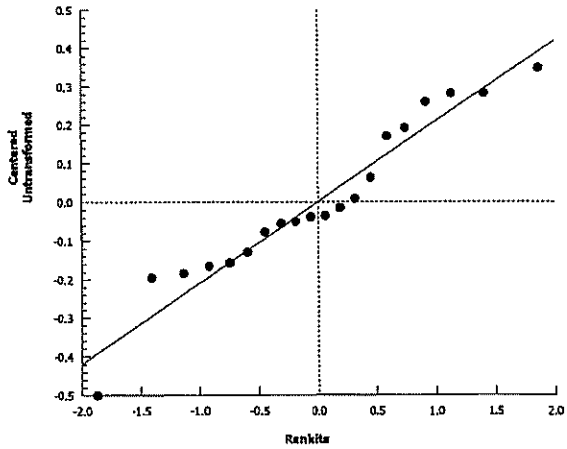
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.234	0.77	1.462	1.552	1.332
0.0123		0.888	0.9	1.254	1.034	1.344
0.0247		1.56	1.286	1.2	1.12	1.222
0.037		1.252	1.616	1.138	1.228	1.102

Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	17-6769-7661	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.7
Analyzed:	29 Sep-14 12:13	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Graphics





CETIS Analytical Report

Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	07-1563-3212	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	29 Sep-14 12:13	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Sample ID:	00-8547-0468	**Code:**	LTS0914.072tops	**Client:**	LTS Environmental, Inc.
Sample Date:	10 Sep-14 13:00	**Material:**	Sample Water	**Project:**	
Receive Date:	11 Sep-14 08:10	**Source:**	Bioassay Report		
Sample Age:	28h (5.6 °C)	**Station:**	Produced Water Discharge (Platform Hidalg		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC5	>0.037	N/A	N/A	<2703	NA	NA
EC10	>0.037	N/A	N/A	<2703	NA	NA
EC15	>0.037	N/A	N/A	<2703	NA	NA
EC20	>0.037	N/A	N/A	<2703	NA	NA
EC25	>0.037	N/A	N/A	<2703	NA	NA
EC40	>0.037	N/A	N/A	<2703	NA	NA
EC50	>0.037	N/A	N/A	<2703	NA	NA

7d Survival Rate Summary

			Calculated Variate(A/B)								
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Negative Control	5	0.96	0.8	1	0.04	0.08944	9.32%	0.0%	24	25
0.0123		5	1	1	1	0	0	0.0%	-4.17%	25	25
0.0247		5	1	1	1	0	0	0.0%	-4.17%	25	25
0.037		5	1	1	1	0	0	0.0%	-4.17%	25	25

7d Survival Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1	0.8	1	1	1
0.0123		1	1	1	1	1
0.0247		1	1	1	1	1
0.037		1	1	1	1	1

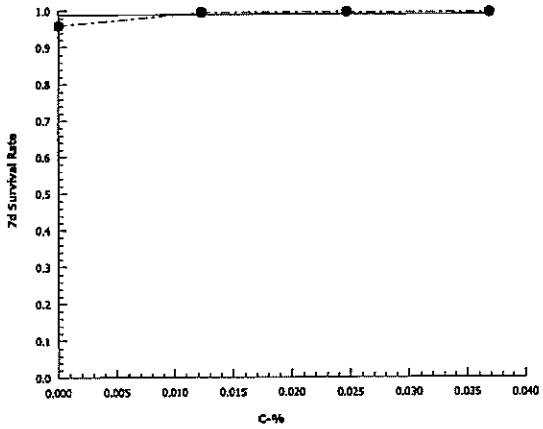
7d Survival Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	5/5	4/5	5/5	5/5	5/5
0.0123		5/5	5/5	5/5	5/5	5/5
0.0247		5/5	5/5	5/5	5/5	5/5
0.037		5/5	5/5	5/5	5/5	5/5

Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	07-1563-3212	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	29 Sep-14 12:13	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Graphics



Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	11-3474-4209	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.7
Analyzed:	29 Sep-14 12:13	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Sample ID:	00-8547-0468	**Code:**	LTS0914.072tops	**Client:**	LTS Environmental, Inc.
Sample Date:	10 Sep-14 13:00	**Material:**	Sample Water	**Project:**	
Receive Date:	11 Sep-14 08:10	**Source:**	Bioassay Report		
Sample Age:	28h (5.6 °C)	**Station:**	Produced Water Discharge (Platform Hidalg		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1749621	280	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	>0.037	N/A	N/A	<2703	NA	NA
IC10	>0.037	N/A	N/A	<2703	NA	NA
IC15	>0.037	N/A	N/A	<2703	NA	NA
IC20	>0.037	N/A	N/A	<2703	NA	NA
IC25	>0.037	N/A	N/A	<2703	NA	NA
IC40	>0.037	N/A	N/A	<2703	NA	NA
IC50	>0.037	N/A	N/A	<2703	NA	NA

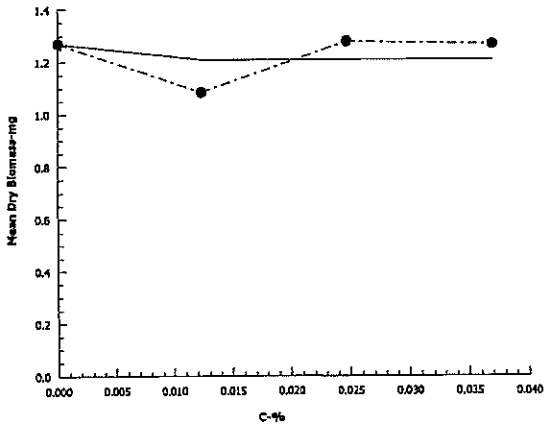
Mean Dry Biomass-mg Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	1.27	0.77	1.552	0.1363	0.3048	24.0%	0.0%
0.0123		5	1.084	0.888	1.344	0.09254	0.2069	19.09%	14.65%
0.0247		5	1.278	1.12	1.56	0.07542	0.1686	13.2%	-0.6%
0.037		5	1.267	1.102	1.616	0.09149	0.2046	16.14%	0.22%

Mean Dry Biomass-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.234	0.77	1.462	1.552	1.332
0.0123		0.888	0.9	1.254	1.034	1.344
0.0247		1.56	1.286	1.2	1.12	1.222
0.037		1.252	1.616	1.138	1.228	1.102

Graphics



CETIS Measurement Report

Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Batch ID:	03-9878-0036	**Test Type:**	Growth-Survival (7d)	**Analyst:**	
Start Date:	11 Sep-14 16:50	**Protocol:**	EPA/600/R-95/136 (1995)	**Diluent:**	Laboratory Seawater
Ending Date:	18 Sep-14 14:50	**Species:**	Atherinops affinis	**Brine:**	Not Applicable
Duration:	6d 22h	**Source:**	Aquatic Biosystems, CO	**Age:**	

Sample ID:	00-8547-0468	**Code:**	LTS0914.072tops	**Client:**	LTS Environmental, Inc.
Sample Date:	10 Sep-14 13:00	**Material:**	Sample Water	**Project:**	
Receive Date:	11 Sep-14 08:10	**Source:**	Bioassay Report		
Sample Age:	28h (5.6 °C)	**Station:**	Produced Water Discharge (Platform Hidalg		

Dissolved Oxygen-mg/L

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	8	6.8	6.532	7.068	6.3	7.2	0.1134	0.3207	4.72%	0
0.0123		8	6.475	6.113	6.837	5.6	6.9	0.1532	0.4334	6.69%	0
0.0247		8	6.563	6.197	6.928	5.6	6.9	0.1546	0.4373	6.66%	0
0.037		8	6.513	6.154	6.871	5.6	6.9	0.1517	0.4291	6.59%	0
Overall		32	6.587			5.6	7.2				0 (0%)

pH-Units

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	8	7.575	7.536	7.614	7.5	7.6	0.01637	0.04629	0.61%	0
0.0123		8	7.65	7.587	7.713	7.5	7.7	0.02673	0.07559	0.99%	0
0.0247		8	7.65	7.587	7.713	7.5	7.7	0.02673	0.07559	0.99%	0
0.037		8	7.65	7.587	7.713	7.5	7.7	0.02673	0.07559	0.99%	0
Overall		32	7.631			7.5	7.7				0 (0%)

Salinity-ppt

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	8	34	34	34	34	34	0	0	0.0%	0
0.0123		8	34	34	34	34	34	0	0	0.0%	0
0.0247		8	34	34	34	34	34	0	0	0.0%	0
0.037		8	34	34	34	34	34	0	0	0.0%	0
Overall		32	34			34	34				0 (0%)

Temperature-°C

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	8	21	21	21	21	21	0	0	0.0%	0
0.0123		8	21	21	21	21	21	0	0	0.0%	0
0.0247		8	21	21	21	21	21	0	0	0.0%	0
0.037		8	21	21	21	21	21	0	0	0.0%	0
Overall		32	21			21	21				0 (0%)

Dissolved Oxygen-mg/L

C-%	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	7	7.2	7.1	7	6.7	6.6	6.5	6.3
0.0123		6.9	6.5	6.8	6.9	6.4	6.5	6.2	5.6
0.0247		6.9	6.8	6.8	6.9	6.6	6.6	6.3	5.6
0.037		6.9	6.6	6.7	6.9	6.6	6.6	6.2	5.6

pH-Units

C-%	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	7.6	7.6	7.6	7.6	7.6	7.6	7.5	7.5
0.0123		7.6	7.7	7.7	7.7	7.7	7.7	7.6	7.5
0.0247		7.6	7.7	7.7	7.7	7.7	7.7	7.6	7.5
0.037		7.6	7.7	7.7	7.7	7.7	7.7	7.6	7.5

Salinity-ppt

C-%	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	34	34	34	34	34	34	34	34
0.0123		34	34	34	34	34	34	34	34
0.0247		34	34	34	34	34	34	34	34
0.037		34	34	34	34	34	34	34	34

Temperature-°C

C-%	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	21	21	21	21	21	21	21	21
0.0123		21	21	21	21	21	21	21	21
0.0247		21	21	21	21	21	21	21	21
0.037		21	21	21	21	21	21	21	21

aquatic bioassay & consulting laboratories, inc

September 29, 2014

Freeport -McMoRan Oil & Gas
Attn: Ruth Juris
201 S. Broadway
Orcutt, CA 93455

Dear Ms. Juris:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms EPA/600/R-95-136, 1995*. Results were as follows:

CLIENT:	Freeport -McMoRan Oil & Gas
SAMPLE I.D.:	Produced Water Discharge (Platform Hidalgo)
DATE RECEIVED:	11 Sept - 14
ABC LAB. NO.:	LTS0914.072

CHRONIC ABALONE LARVAL DEVELOPMENT BIOASSAY

IWC CONCENTRATION = 0.0247 %

TST RESULT

PASS

Yours very truly,

Scott Johnson
Laboratory Director

CETIS Summary Report

Report Date: 29 Sep-14 11:42 (p 1 of 1)
Test Code: LTS0914.072abs | 07-3869-5622

Red Abalone Larval Development Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Batch ID:	09-4086-2267	**Test Type:**	Development	**Analyst:**	
Start Date:	11 Sep-14 12:31	**Protocol:**	EPA/600/R-95/136 (1995)	**Diluent:**	Laboratory Seawater
Ending Date:	13 Sep-14 12:30	**Species:**	Haliotis rufescens	**Brine:**	Not Applicable
Duration:	48h	**Source:**	Cultured Abalone	**Age:**	

Sample ID:	20-4892-8554	**Code:**	LTS0914.072abs	**Client:**	LTS Environmental, Inc.
Sample Date:	10 Sep-14 13:00	**Material:**	Sample Water	**Project:**	
Receive Date:	11 Sep-14 08:10	**Source:**	Bioassay Report		
Sample Age:	24h (5.6 °C)	**Station:**	Produced Water Discharge (Platform Hidalg		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
06-0705-7490	Proportion Normal	0.037	>0.037	NA	NA	2703	Steel Many-One Rank Sum Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
04-7602-7841	Proportion Normal	EC5	>0.037	N/A	N/A	<2703	Linear Interpolation (ICPIN)
		EC10	>0.037	N/A	N/A	<2703	
		EC15	>0.037	N/A	N/A	<2703	
		EC20	>0.037	N/A	N/A	<2703	
		EC25	>0.037	N/A	N/A	<2703	
		EC40	>0.037	N/A	N/A	<2703	
		EC50	>0.037	N/A	N/A	<2703	

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
04-7602-7841	Proportion Normal	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria
06-0705-7490	Proportion Normal	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria

Proportion Normal Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	1	1	1	1	1	0	0	0.0%	0.0%
0.0123		5	1	1	1	1	1	0	0	0.0%	0.0%
0.0247		5	1	1	1	1	1	0	0	0.0%	0.0%
0.037		5	1	1	1	1	1	0	0	0.0%	0.0%

Proportion Normal Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1	1	1	1	1
0.0123		1	1	1	1	1
0.0247		1	1	1	1	1
0.037		1	1	1	1	1

Proportion Normal Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	100/100	100/100	100/100	100/100	100/100
0.0123		100/100	100/100	100/100	100/100	100/100
0.0247		100/100	100/100	100/100	100/100	100/100
0.037		100/100	100/100	100/100	100/100	100/100

CETIS Analytical Report

Report Date: 29 Sep-14 11:42 (p 1 of 2)
Test Code: LTS0914.072abs | 07-3869-5622

Red Abalone Larval Development Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	06-0705-7490	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.8.7
Analyzed:	29 Sep-14 11:42	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Sample ID:	20-4892-8554	**Code:**	LTS0914.072abs	**Client:**	LTS Environmental, Inc.
Sample Date:	10 Sep-14 13:00	**Material:**	Sample Water	**Project:**	
Receive Date:	11 Sep-14 08:10	**Source:**	Bioassay Report		
Sample Age:	24h (5.6 °C)	**Station:**	Produced Water Discharge (Platform Hidalg		

Data Transform	Zeta	Alt Hyp	Trials	Seed	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA	0.037	>0.037	NA	2703

Steel Many-One Rank Sum Test

Control	vs	C-%	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Negative Control		0.0123	27.5	17	1	8	0.7500	Asymp	Non-Significant Effect
		0.0247	27.5	17	1	8	0.7500	Asymp	Non-Significant Effect
		0.037	27.5	17	1	8	0.7500	Asymp	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0	0	3	65540	<0.0001	Significant Effect
Error	0	0	16			
Total	0		19			

Proportion Normal Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	5	1	1	1	1	1	1	0	0.0%	0.0%
0.0123		5	1	1	1	1	1	1	0	0.0%	0.0%
0.0247		5	1	1	1	1	1	1	0	0.0%	0.0%
0.037		5	1	1	1	1	1	1	0	0.0%	0.0%

Angular (Corrected) Transformed Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Contr	5	1.521	1.521	1.521	1.521	1.521	1.521	0	0.0%	0.0%
0.0123		5	1.521	1.521	1.521	1.521	1.521	1.521	0	0.0%	0.0%
0.0247		5	1.521	1.521	1.521	1.521	1.521	1.521	0	0.0%	0.0%
0.037		5	1.521	1.521	1.521	1.521	1.521	1.521	0	0.0%	0.0%

Proportion Normal Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1	1	1	1	1
0.0123		1	1	1	1	1
0.0247		1	1	1	1	1
0.037		1	1	1	1	1

Angular (Corrected) Transformed Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.521	1.521	1.521	1.521	1.521
0.0123		1.521	1.521	1.521	1.521	1.521
0.0247		1.521	1.521	1.521	1.521	1.521
0.037		1.521	1.521	1.521	1.521	1.521

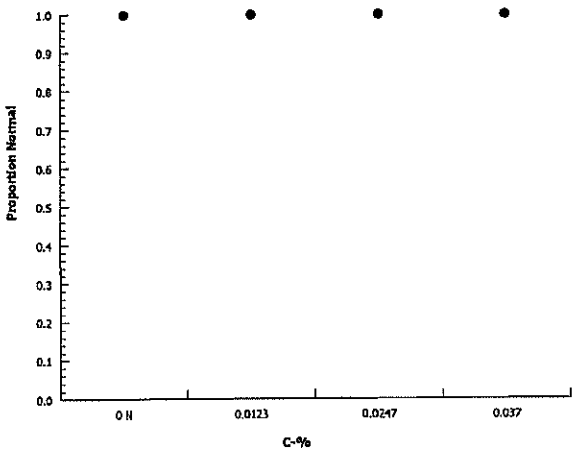
Proportion Normal Binomials

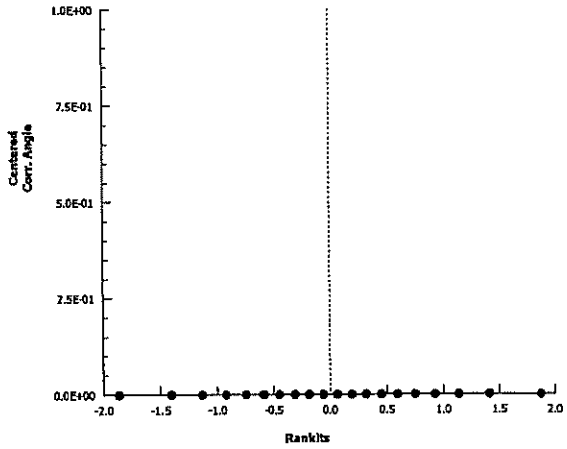
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	100/100	100/100	100/100	100/100	100/100
0.0123		100/100	100/100	100/100	100/100	100/100
0.0247		100/100	100/100	100/100	100/100	100/100
0.037		100/100	100/100	100/100	100/100	100/100

Red Abalone Larval Development Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	06-0705-7490	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.8.7
Analyzed:	29 Sep-14 11:42	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Graphics





CETIS Analytical Report

Report Date: 29 Sep-14 11:42 (p 1 of 2)
Test Code: LTS0914.072abs | 07-3869-5622

Red Abalone Larval Development Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	04-7602-7841	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.8.7
Analyzed:	29 Sep-14 11:42	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Sample ID:	20-4892-8554	**Code:**	LTS0914.072abs	**Client:**	LTS Environmental, Inc.
Sample Date:	10 Sep-14 13:00	**Material:**	Sample Water	**Project:**	
Receive Date:	11 Sep-14 08:10	**Source:**	Bioassay Report		
Sample Age:	24h (5.6 °C)	**Station:**	Produced Water Discharge (Platform Hidalg		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC5	>0.037	N/A	N/A	<2703	NA	NA
EC10	>0.037	N/A	N/A	<2703	NA	NA
EC15	>0.037	N/A	N/A	<2703	NA	NA
EC20	>0.037	N/A	N/A	<2703	NA	NA
EC25	>0.037	N/A	N/A	<2703	NA	NA
EC40	>0.037	N/A	N/A	<2703	NA	NA
EC50	>0.037	N/A	N/A	<2703	NA	NA

Proportion Normal Summary

			Calculated Variate(A/B)								
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Negative Control	5	1	1	1	0	0	0.0%	0.0%	500	500
0.0123		5	1	1	1	0	0	0.0%	0.0%	500	500
0.0247		5	1	1	1	0	0	0.0%	0.0%	500	500
0.037		5	1	1	1	0	0	0.0%	0.0%	500	500

Proportion Normal Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1	1	1	1	1
0.0123		1	1	1	1	1
0.0247		1	1	1	1	1
0.037		1	1	1	1	1

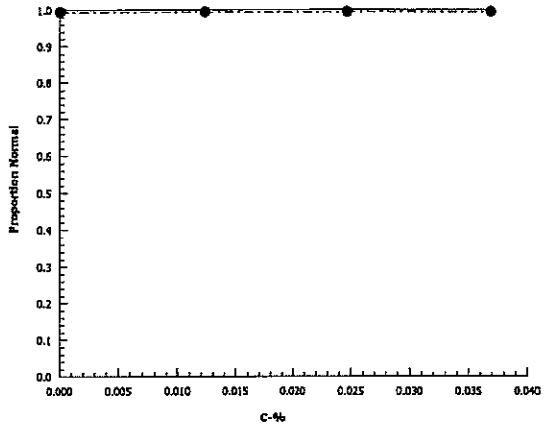
Proportion Normal Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	100/100	100/100	100/100	100/100	100/100
0.0123		100/100	100/100	100/100	100/100	100/100
0.0247		100/100	100/100	100/100	100/100	100/100
0.037		100/100	100/100	100/100	100/100	100/100

Red Abalone Larval Development Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	04-7602-7841	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.8.7
Analyzed:	29 Sep-14 11:42	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Graphics



CETIS Measurement Report

Red Abalone Larval Development Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Batch ID:	09-4086-2267	**Test Type:**	Development	**Analyst:**	
Start Date:	11 Sep-14 12:31	**Protocol:**	EPA/600/R-95/136 (1995)	**Diluent:**	Laboratory Seawater
Ending Date:	13 Sep-14 12:30	**Species:**	Haliotis rufescens	**Brine:**	Not Applicable
Duration:	48h	**Source:**	Cultured Abalone	**Age:**	

Sample ID:	20-4892-8554	**Code:**	LTS0914.072abs	**Client:**	LTS Environmental, Inc.
Sample Date:	10 Sep-14 13:00	**Material:**	Sample Water	**Project:**	
Receive Date:	11 Sep-14 08:10	**Source:**	Bioassay Report		
Sample Age:	24h (5.6 °C)	**Station:**	Produced Water Discharge (Platform Hidalg		

Parameter Acceptability Criteria

Parameter	Min	Max	Acceptability Limits	Overlap	Decision
Salinity-ppt	34	34	32 - 36	Yes	Results Within Limits
Temperature-°C	14.9	15.1	14 - 16	Yes	Results Within Limits

Dissolved Oxygen-mg/L

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	6.2	-19.21	31.61	4.2	8.2	2	2.828	45.62%	0
0.0123		2	6.6	-11.19	24.39	5.2	8	1.4	1.98	30.0%	0
0.0247		2	6.95	-7.662	21.56	5.8	8.1	1.15	1.626	23.4%	0
0.037		2	6.8	-8.447	22.05	5.6	8	1.2	1.697	24.96%	0
Overall		8	6.638			4.2	8.2				0 (0%)

pH-Units

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	7.35	5.444	9.256	7.2	7.5	0.15	0.2121	2.89%	0
0.0123		2	7.45	6.815	8.085	7.4	7.5	0.05	0.07072	0.95%	0
0.0247		2	7.45	6.815	8.085	7.4	7.5	0.05	0.07072	0.95%	0
0.037		2	7.45	6.815	8.085	7.4	7.5	0.05	0.07072	0.95%	0
Overall		8	7.425			7.2	7.5				0 (0%)

Salinity-ppt

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	34	34	34	34	34	0	0	0.0%	0
0.0123		2	34	34	34	34	34	0	0	0.0%	0
0.0247		2	34	34	34	34	34	0	0	0.0%	0
0.037		2	34	34	34	34	34	0	0	0.0%	0
Overall		8	34			34	34				0 (0%)

Temperature-°C

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	15	13.73	16.27	14.9	15.1	0.1	0.1414	0.94%	0
0.0123		2	15	13.73	16.27	14.9	15.1	0.1	0.1414	0.94%	0
0.0247		2	15	13.73	16.27	14.9	15.1	0.1	0.1414	0.94%	0
0.037		2	15	13.73	16.27	14.9	15.1	0.1	0.1414	0.94%	0
Overall		8	15			14.9	15.1				0 (0%)

Dissolved Oxygen-mg/L

C-%	Control Type	1	2
0	Negative Contr	8.2	4.2
0.0123		8	5.2
0.0247		8.1	5.8
0.037		8	5.6

pH-Units

C-%	Control Type	1	2
0	Negative Contr	7.5	7.2
0.0123		7.5	7.4
0.0247		7.5	7.4
0.037		7.5	7.4

Salinity-ppt

C-%	Control Type	1	2
0	Negative Contr	34	34
0.0123		34	34
0.0247		34	34
0.037		34	34

Temperature-°C

C-%	Control Type	1	2
0	Negative Contr	15.1	14.9
0.0123		15.1	14.9
0.0247		15.1	14.9
0.037		15.1	14.9

aquatic bioassay & consulting laboratories, inc

September 29, 2014

Freeport -McMoRan Oil & Gas
Attn: Ruth Juris
201 S. Broadway
Orcutt, CA 93455

Dear Ms. Juris:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms EPA/600/R-95-136, 1995*. Results were as follows:

CLIENT:	Freeport -McMoRan Oil & Gas
SAMPLE I.D.:	Produced Water Discharge (Platform Hidalgo)
DATE RECEIVED:	11 Sept - 14
ABC LAB. NO.:	LTS0914.072

CHRONIC KELP GERMINATION AND GROWTH BIOASSAY

IWC CONCENTRATION = 0.0247 %

TST RESULT

Germination	PASS
Tube Length	PASS

Yours very truly,

Scott Johnson
Laboratory Director

29 north olive st. ventura, ca 93001 (805) 643 5621 www.aquabio.org

CETIS Summary Report

Report Date: 29 Sep-14 13:44 (p 1 of 2)
Test Code: LTS0914.072klp | 07-9541-2072

Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Batch ID:	06-4411-4167	**Test Type:**	Growth-Germination	**Analyst:**	
Start Date:	11 Sep-14 16:21	**Protocol:**	EPA/600/R-95/136 (1995)	**Diluent:**	Laboratory Seawater
Ending Date:	13 Sep-14 16:21	**Species:**	Macrocystis pyrifera	**Brine:**	Not Applicable
Duration:	48h	**Source:**	Aquatic Bioassay Labs Collection	**Age:**	

Sample ID:	00-4921-1740	**Code:**	LTS0914.072klp	**Client:**	LTS Environmental, Inc.
Sample Date:	10 Sep-14 13:00	**Material:**	Sample Water	**Project:**	
Receive Date:	11 Sep-14 08:10	**Source:**	Bioassay Report		
Sample Age:	27h (5.6 °C)	**Station:**	Produced Water Discharge (Platform Hidalg		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
09-0443-9595	Germination Rate	0.037	>0.037	NA	3.65%	2703	Dunnett Multiple Comparison Test
15-0033-6903	Mean Length	0.037	>0.037	NA	2.89%	2703	Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
02-1047-5294	Germination Rate	EC5	>0.037	N/A	N/A	<2703	Linear Interpolation (ICPIN)
		EC10	>0.037	N/A	N/A	<2703	
		EC15	>0.037	N/A	N/A	<2703	
		EC20	>0.037	N/A	N/A	<2703	
		EC25	>0.037	N/A	N/A	<2703	
		EC40	>0.037	N/A	N/A	<2703	
		EC50	>0.037	N/A	N/A	<2703	
03-3731-4818	Mean Length	IC5	>0.037	N/A	N/A	<2703	Linear Interpolation (ICPIN)
		IC10	>0.037	N/A	N/A	<2703	
		IC15	>0.037	N/A	N/A	<2703	
		IC20	>0.037	N/A	N/A	<2703	
		IC25	>0.037	N/A	N/A	<2703	
		IC40	>0.037	N/A	N/A	<2703	
		IC50	>0.037	N/A	N/A	<2703	

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
02-1047-5294	Germination Rate	Control Resp	0.906	0.7 - NL	Yes	Passes Acceptability Criteria
09-0443-9595	Germination Rate	Control Resp	0.906	0.7 - NL	Yes	Passes Acceptability Criteria
03-3731-4818	Mean Length	Control Resp	15.04	10 - NL	Yes	Passes Acceptability Criteria
15-0033-6903	Mean Length	Control Resp	15.04	10 - NL	Yes	Passes Acceptability Criteria
09-0443-9595	Germination Rate	PMSD	0.0365	NL - 0.2	No	Passes Acceptability Criteria
15-0033-6903	Mean Length	PMSD	0.0289	NL - 0.2	No	Passes Acceptability Criteria

Germination Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	0.906	0.8872	0.9248	0.89	0.93	0.006782	0.01517	1.67%	0.0%
0.0123		5	0.928	0.9096	0.9464	0.91	0.95	0.006633	0.01483	1.6%	-2.43%
0.0247		5	0.914	0.8932	0.9348	0.9	0.94	0.007483	0.01673	1.83%	-0.88%
0.037		5	0.928	0.8947	0.9613	0.9	0.97	0.012	0.02683	2.89%	-2.43%

Mean Length Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	15.04	14.56	15.52	14.6	15.5	0.172	0.3847	2.56%	0.0%
0.0123		5	15.08	14.8	15.36	14.8	15.4	0.102	0.228	1.51%	-0.27%
0.0247		5	15.44	14.97	15.91	15.1	15.9	0.1691	0.3782	2.45%	-2.66%
0.037		5	14.86	14.62	15.1	14.6	15	0.08718	0.1949	1.31%	1.2%

Germination Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	0.91	0.9	0.93	0.9	0.89
0.0123		0.93	0.95	0.92	0.91	0.93
0.0247		0.94	0.92	0.91	0.9	0.9
0.037		0.93	0.97	0.91	0.9	0.93

Mean Length Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	14.7	15.3	15.1	14.6	15.5
0.0123		15	15.2	15.4	14.8	15
0.0247		15.1	15.2	15.8	15.2	15.9
0.037		14.7	14.6	15	15	15

Germination Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	91/100	90/100	93/100	90/100	89/100
0.0123		93/100	95/100	92/100	91/100	93/100
0.0247		94/100	92/100	91/100	90/100	90/100
0.037		93/100	97/100	91/100	90/100	93/100

CETIS Analytical Report

Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	09-0443-9595	**Endpoint:**	Germination Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	29 Sep-14 13:44	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Sample ID:	00-4921-1740	**Code:**	LTS0914.072klp	**Client:**	LTS Environmental, Inc.
Sample Date:	10 Sep-14 13:00	**Material:**	Sample Water	**Project:**	
Receive Date:	11 Sep-14 08:10	**Source:**	Bioassay Report		
Sample Age:	27h (5.6 °C)	**Station:**	Produced Water Discharge (Platform Hidalg		

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA	3.65%	0.037	>0.037	NA	2703

Dunnett Multiple Comparison Test

Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Negative Control		0.0123	-1.672	2.227	0.054	8	0.9928	CDF	Non-Significant Effect
		0.0247	-0.5941	2.227	0.054	8	0.9095	CDF	Non-Significant Effect
		0.037	-1.809	2.227	0.054	8	0.9950	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.006591379	0.002197126	3	1.513	0.2494	Non-Significant Effect
Error	0.0232392	0.00145245	16			
Total	0.02983058		19			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	2.982	11.34	0.3943	Equal Variances
Variances	Mod Levene Equality of Variance	0.6946	5.953	0.5729	Equal Variances
Variances	Levene Equality of Variance	0.5683	5.292	0.6438	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9193	0.866	0.0960	Normal Distribution
Distribution	Kolmogorov-Smirnov D	0.1905	0.2235	0.0555	Normal Distribution
Distribution	D'Agostino Skewness	2.045	2.576	0.0408	Normal Distribution
Distribution	D'Agostino Kurtosis	1.38	2.576	0.1675	Normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	6.089	9.21	0.0476	Normal Distribution
Distribution	Anderson-Darling A2 Normality	0.7415	3.878	0.0532	Normal Distribution

Germination Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	5	0.906	0.8872	0.9248	0.9	0.89	0.93	0.006782	1.67%	0.0%
0.0123		5	0.928	0.9096	0.9464	0.93	0.91	0.95	0.006633	1.6%	-2.43%
0.0247		5	0.914	0.8932	0.9348	0.91	0.9	0.94	0.007483	1.83%	-0.88%
0.037		5	0.928	0.8947	0.9613	0.93	0.9	0.97	0.012	2.89%	-2.43%

Angular (Corrected) Transformed Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Contr	5	1.26	1.227	1.293	1.249	1.233	1.303	0.01198	2.13%	0.0%
0.0123		5	1.3	1.264	1.337	1.303	1.266	1.345	0.01318	2.27%	-3.2%
0.0247		5	1.274	1.236	1.313	1.266	1.249	1.323	0.01386	2.43%	-1.14%
0.037		5	1.304	1.233	1.375	1.303	1.249	1.397	0.02555	4.38%	-3.46%

Germination Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	0.91	0.9	0.93	0.9	0.89
0.0123		0.93	0.95	0.92	0.91	0.93
0.0247		0.94	0.92	0.91	0.9	0.9
0.037		0.93	0.97	0.91	0.9	0.93

Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	09-0443-9595	**Endpoint:**	Germination Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	29 Sep-14 13:44	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

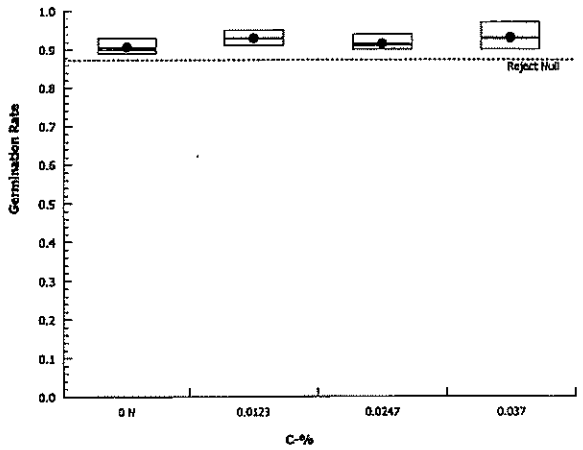
Angular (Corrected) Transformed Detail

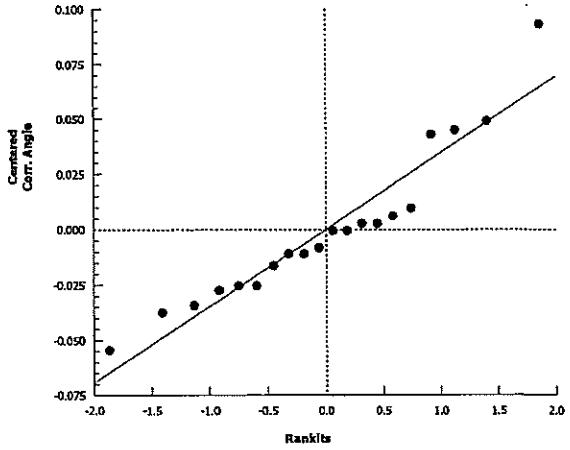
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.266	1.249	1.303	1.249	1.233
0.0123		1.303	1.345	1.284	1.266	1.303
0.0247		1.323	1.284	1.266	1.249	1.249
0.037		1.303	1.397	1.266	1.249	1.303

Germination Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	91/100	90/100	93/100	90/100	89/100
0.0123		93/100	95/100	92/100	91/100	93/100
0.0247		94/100	92/100	91/100	90/100	90/100
0.037		93/100	97/100	91/100	90/100	93/100

Graphics





Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	15-0033-6903	**Endpoint:**	Mean Length	**CETIS Version:**	CETISv1.8.7
Analyzed:	29 Sep-14 13:44	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Sample ID:	00-4921-1740	**Code:**	LTS0914.072klp	**Client:**	LTS Environmental, Inc.
Sample Date:	10 Sep-14 13:00	**Material:**	Sample Water	**Project:**	
Receive Date:	11 Sep-14 08:10	**Source:**	Bioassay Report		
Sample Age:	27h (5.6 °C)	**Station:**	Produced Water Discharge (Platform Hidalg		

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	2.89%	0.037	>0.037	NA	2703

Dunnett Multiple Comparison Test

Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Negative Control		0.0123	-0.2049	2.227	0.435	8	0.8173	CDF	Non-Significant Effect
		0.0247	-2.049	2.227	0.435	8	0.9974	CDF	Non-Significant Effect
		0.037	0.9222	2.227	0.435	8	0.3626	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.8854997	0.2951666	3	3.099	0.0564	Non-Significant Effect
Error	1.523999	0.09524994	16			
Total	2.409499		19			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	2.453	11.34	0.4838	Equal Variances
Variances	Mod Levene Equality of Variance	0.8	5.953	0.5174	Equal Variances
Variances	Levene Equality of Variance	2.893	5.292	0.0676	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9389	0.866	0.2286	Normal Distribution
Distribution	Kolmogorov-Smirnov D	0.1516	0.2235	0.2659	Normal Distribution
Distribution	D'Agostino Skewness	0.3505	2.576	0.7259	Normal Distribution
Distribution	D'Agostino Kurtosis	1.797	2.576	0.0723	Normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	3.352	9.21	0.1871	Normal Distribution
Distribution	Anderson-Darling A2 Normality	0.4986	3.878	0.2143	Normal Distribution

Mean Length Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	5	15.04	14.56	15.52	15.1	14.6	15.5	0.172	2.56%	0.0%
0.0123		5	15.08	14.8	15.36	15	14.8	15.4	0.102	1.51%	-0.27%
0.0247		5	15.44	14.97	15.91	15.2	15.1	15.9	0.1691	2.45%	-2.66%
0.037		5	14.86	14.62	15.1	15	14.6	15	0.08718	1.31%	1.2%

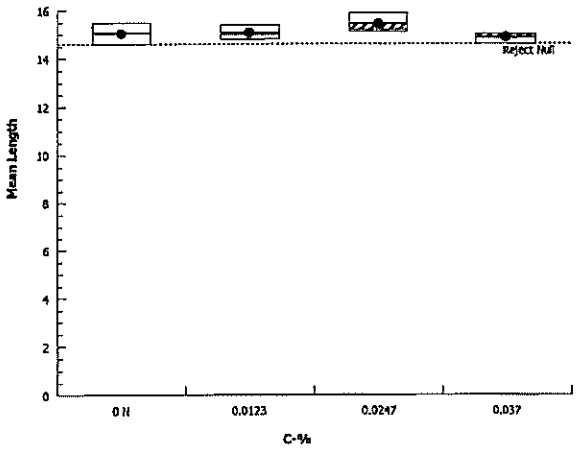
Mean Length Detail

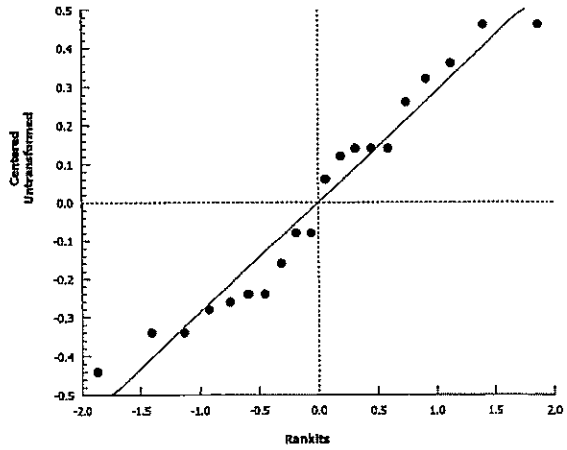
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	14.7	15.3	15.1	14.6	15.5
0.0123		15	15.2	15.4	14.8	15
0.0247		15.1	15.2	15.8	15.2	15.9
0.037		14.7	14.6	15	15	15

Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	15-0033-6903	**Endpoint:**	Mean Length	**CETIS Version:**	CETISv1.8.7
Analyzed:	29 Sep-14 13:44	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Graphics





CETIS Analytical Report

Report Date: 29 Sep-14 13:44 (p 1 of 3)
Test Code: LTS0914.072klp | 07-9541-2072

Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	02-1047-5294	**Endpoint:**	Germination Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	29 Sep-14 13:44	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Sample ID:	00-4921-1740	**Code:**	LTS0914.072klp	**Client:**	LTS Environmental, Inc.
Sample Date:	10 Sep-14 13:00	**Material:**	Sample Water	**Project:**	
Receive Date:	11 Sep-14 08:10	**Source:**	Bioassay Report		
Sample Age:	27h (5.6 °C)	**Station:**	Produced Water Discharge (Platform Hidalg		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC5	>0.037	N/A	N/A	<2703	NA	NA
EC10	>0.037	N/A	N/A	<2703	NA	NA
EC15	>0.037	N/A	N/A	<2703	NA	NA
EC20	>0.037	N/A	N/A	<2703	NA	NA
EC25	>0.037	N/A	N/A	<2703	NA	NA
EC40	>0.037	N/A	N/A	<2703	NA	NA
EC50	>0.037	N/A	N/A	<2703	NA	NA

Germination Rate Summary

			Calculated Variate(A/B)								
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Negative Control	5	0.906	0.89	0.93	0.006782	0.01516	1.67%	0.0%	453	500
0.0123		5	0.928	0.91	0.95	0.006633	0.01483	1.6%	-2.43%	464	500
0.0247		5	0.914	0.9	0.94	0.007483	0.01673	1.83%	-0.88%	457	500
0.037		5	0.928	0.9	0.97	0.012	0.02683	2.89%	-2.43%	464	500

Germination Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	0.91	0.9	0.93	0.9	0.89
0.0123		0.93	0.95	0.92	0.91	0.93
0.0247		0.94	0.92	0.91	0.9	0.9
0.037		0.93	0.97	0.91	0.9	0.93

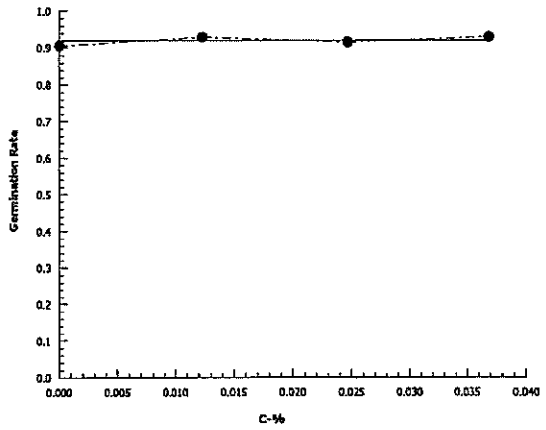
Germination Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	91/100	90/100	93/100	90/100	89/100
0.0123		93/100	95/100	92/100	91/100	93/100
0.0247		94/100	92/100	91/100	90/100	90/100
0.037		93/100	97/100	91/100	90/100	93/100

Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	02-1047-5294	**Endpoint:**	Germination Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	29 Sep-14 13:44	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Graphics



Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	03-3731-4818	**Endpoint:**	Mean Length	**CETIS Version:**	CETISv1.8.7
Analyzed:	29 Sep-14 13:44	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Sample ID:	00-4921-1740	**Code:**	LTS0914.072klp	**Client:**	LTS Environmental, Inc.
Sample Date:	10 Sep-14 13:00	**Material:**	Sample Water	**Project:**	
Receive Date:	11 Sep-14 08:10	**Source:**	Bioassay Report		
Sample Age:	27h (5.6 °C)	**Station:**	Produced Water Discharge (Platform Hidalg		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	898786	280	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	>0.037	N/A	N/A	<2703	NA	NA
IC10	>0.037	N/A	N/A	<2703	NA	NA
IC15	>0.037	N/A	N/A	<2703	NA	NA
IC20	>0.037	N/A	N/A	<2703	NA	NA
IC25	>0.037	N/A	N/A	<2703	NA	NA
IC40	>0.037	N/A	N/A	<2703	NA	NA
IC50	>0.037	N/A	N/A	<2703	NA	NA

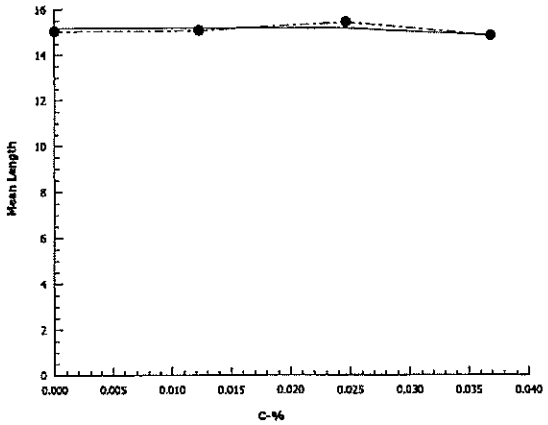
Mean Length Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	15.04	14.6	15.5	0.172	0.3847	2.56%	0.0%
0.0123		5	15.08	14.8	15.4	0.102	0.228	1.51%	-0.27%
0.0247		5	15.44	15.1	15.9	0.1691	0.3781	2.45%	-2.66%
0.037		5	14.86	14.6	15	0.08718	0.1949	1.31%	1.2%

Mean Length Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	14.7	15.3	15.1	14.6	15.5
0.0123		15	15.2	15.4	14.8	15
0.0247		15.1	15.2	15.8	15.2	15.9
0.037		14.7	14.6	15	15	15

Graphics



CETIS Measurement Report

Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Batch ID:	06-4411-4167	**Test Type:**	Growth-Germination	**Analyst:**	
Start Date:	11 Sep-14 16:21	**Protocol:**	EPA/600/R-95/136 (1995)	**Diluent:**	Laboratory Seawater
Ending Date:	13 Sep-14 16:21	**Species:**	Macrocystis pyrifera	**Brine:**	Not Applicable
Duration:	48h	**Source:**	Aquatic Bioassay Labs Collection	**Age:**	

Sample ID:	00-4921-1740	**Code:**	LTS0914.072klp	**Client:**	LTS Environmental, Inc.
Sample Date:	10 Sep-14 13:00	**Material:**	Sample Water	**Project:**	
Receive Date:	11 Sep-14 08:10	**Source:**	Bioassay Report		
Sample Age:	27h (5.6 °C)	**Station:**	Produced Water Discharge (Platform Hidalg		

Dissolved Oxygen-mg/L

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	6.5	2.688	10.31	6.2	6.8	0.3	0.4243	6.53%	0
0.0123		2	6.3	6.298	6.302	6.3	6.3	0	0	0.0%	0
0.0247		2	6.2	6.187	6.213	6.2	6.2	0	0	0.0%	0
0.037		2	6.3	6.298	6.302	6.3	6.3	0	0	0.0%	0
Overall		8	6.325			6.2	6.8				0 (0%)

pH-Units

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
0.0123		2	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
0.0247		2	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
0.037		2	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
Overall		8	7.9			7.9	7.9				0 (0%)

Salinity-ppt

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	34	34	34	34	34	0	0	0.0%	0
0.0123		2	34	34	34	34	34	0	0	0.0%	0
0.0247		2	34	34	34	34	34	0	0	0.0%	0
0.037		2	34	34	34	34	34	0	0	0.0%	0
Overall		8	34			34	34				0 (0%)

Temperature-°C

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	14.7	13.43	15.97	14.6	14.8	0.09999	0.1414	0.96%	0
0.0123		2	14.7	13.43	15.97	14.6	14.8	0.09999	0.1414	0.96%	0
0.0247		2	14.7	13.43	15.97	14.6	14.8	0.09999	0.1414	0.96%	0
0.037		2	14.7	13.43	15.97	14.6	14.8	0.09999	0.1414	0.96%	0
Overall		8	14.7			14.6	14.8				0 (0%)

Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Dissolved Oxygen-mg/L

C-%	Control Type	1	2
0	Negative Contr	6.8	6.2
0.0123		6.3	6.3
0.0247		6.2	6.2
0.037		6.3	6.3

pH-Units

C-%	Control Type	1	2
0	Negative Contr	7.9	7.9
0.0123		7.9	7.9
0.0247		7.9	7.9
0.037		7.9	7.9

Salinity-ppt

C-%	Control Type	1	2
0	Negative Contr	34	34
0.0123		34	34
0.0247		34	34
0.037		34	34

Temperature-°C

C-%	Control Type	1	2
0	Negative Contr	14.6	14.8
0.0123		14.6	14.8
0.0247		14.6	14.8
0.037		14.6	14.8

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 805-644-4560	**Report to:** FM O&G Ruth Juris 201 S Broadway Orcutt, Ca 93455	**Bill to:** Freeport McMoRan O&G 700 Milam, Suite 3100 Houston, Tx 77002

FACILITY: Platform Hidalgo
COLLECTOR: LTS /
PROJECT/CHARGE # Quarterly NPDES 3-species Toxicity
RESULTS REQUIRED: normal
RESULTS BY: PHONE: _____ FAX: _____

SUBMITTED TO: ABC Lab
REPORT TO: *Ruth Juris* PHONE: _____
FAX: _____
COPIES TO: *Steve Lawry @ LTS* PHONE: *644-4560*
Platform Supervisor PHONE: _____
(@ Orcutt)

SAMPLE NO.	SAMPLE ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	PRESERV.	ANALYSES REQUESTED (METHOD)
1	Produced Water Discharge	Comp	1 quart	9.9/10.14	Ice	Red Abalone - Larval development Giant Kelp - Germination & germ tube length Top Smelt - Larval survival & growth
						IWC = .0247 1.5 x IWC = .0370 0.5 x IWC = .0123
						Composite times (3-hour intervals):
						1600/1900/2200/0100/0400 0700/1000/1300

Comments: _____

Relinquished by:		Date: 9.11.14	
Received by:		Time: 810	

Relinquished by:		Date:	
Received by:		Time:	

Relinquished by:		Date:	
Received by:		Time:	

Relinquished by:		Date:	
Received by:		Time:	

TEMP = 5.6 °C
CHLORINE = <0.1
AMMONIA - >10

aquatic bioassay & consulting laboratories, inc

CHRONIC TOPSMELT SURVIVAL AND GROWTH BIOASSAY

DATE: 9 September - 2014

STANDARD TOXICANT: Copper Chloride

ENDPOINT: SURVIVAL

NOEC = 100.00 ug/l

EC25 = 182.70 ug/l
EC50 = 250.00 ug/l

ENDPOINT: GROWTH

NOEC = 100.00 ug/l

IC25 = 139.20 ug/l
IC50 = 227.90 ug/l

Yours very truly,

Scott Johnson
Laboratory Director

29 north olive st. ventura, ca 93001 (805) 643 5621 www.aquabio.org

CETIS Summary Report

Report Date: 26 Sep-14 13:32 (p 1 of 2)
Test Code: TOPS090914 | 02-7160-5944

Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Batch ID:	00-5888-3277	**Test Type:**	Growth-Survival (7d)	**Analyst:**	
Start Date:	09 Sep-14 13:24	**Protocol:**	EPA/600/R-95/136 (1995)	**Diluent:**	Laboratory Seawater
Ending Date:	16 Sep-14 11:30	**Species:**	Atherinops affinis	**Brine:**	Not Applicable
Duration:	6d 22h	**Source:**	Aquatic Biosystems, CO	**Age:**	

Sample ID:	16-8181-1283	**Code:**	TOPS090914	**Client:**	ABC Labs
Sample Date:	09 Sep-14 13:24	**Material:**	Copper chloride	**Project:**	REF TOX
Receive Date:		**Source:**	Reference Toxicant		
Sample Age:	NA	**Station:**	REF TOX		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
10-5656-1319	7d Survival Rate	100	180	134.2	17.2%		Dunnett Multiple Comparison Test
19-6344-0688	Mean Dry Biomass-mg	100	180	134.2	20.7%		Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	µg/L	95% LCL	95% UCL	TU	Method
11-7452-5276	7d Survival Rate	EC5	104	0.5	135.5		Linear Interpolation (ICPIN)
		EC10	124	71.5	188		
		EC15	144	108	210.1		
		EC20	164	121.3	220.3		
		EC25	182.7	134.7	228.2		
		EC40	223.1	177.6	263.5		
		EC50	250	211.8	287.5		
10-1233-9042	Mean Dry Biomass-mg	IC5	16.77	5.952	167		Linear Interpolation (ICPIN)
		IC10	33.53	11.9	190.6		
		IC15	50.3	17.85	233.6		
		IC20	115.6	N/A	224.1		
		IC25	139.2	2.087	228.3		
		IC40	198.6	118.2	253.1		
		IC50	227.9	166.3	278.6		

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
10-5656-1319	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria
11-7452-5276	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria
10-1233-9042	Mean Dry Biomass-mg	Control Resp	0.9628	0.85 - NL	Yes	Passes Acceptability Criteria
19-6344-0688	Mean Dry Biomass-mg	Control Resp	0.9628	0.85 - NL	Yes	Passes Acceptability Criteria
10-5656-1319	7d Survival Rate	PMSD	0.1717	NL - 0.25	No	Passes Acceptability Criteria
19-6344-0688	Mean Dry Biomass-mg	PMSD	0.2074	NL - 0.5	No	Passes Acceptability Criteria

7d Survival Rate Summary

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	1	1	1	1	1	0	0	0.0%	0.0%
56		5	0.96	0.8489	1	0.8	1	0.04	0.08944	9.32%	4.0%
100		5	0.96	0.8489	1	0.8	1	0.04	0.08944	9.32%	4.0%
180		5	0.76	0.5522	0.9678	0.6	1	0.07483	0.1673	22.02%	24.0%
320		5	0.24	0.03223	0.4478	0	0.4	0.07483	0.1673	69.72%	76.0%
560		5	0	0	0	0	0	0	0		100.0%

Mean Dry Biomass-mg Summary

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	0.9628	0.6906	1.235	0.662	1.24	0.09802	0.2192	22.77%	0.0%
56		5	0.732	0.6403	0.8237	0.646	0.834	0.03305	0.07389	10.09%	23.97%
100		5	0.872	0.7716	0.9724	0.746	0.958	0.03618	0.08089	9.28%	9.43%
180		5	0.6388	0.4694	0.8082	0.482	0.816	0.06102	0.1364	21.36%	33.65%
320		5	0.1788	0.02569	0.3319	0	0.314	0.05515	0.1233	68.96%	81.43%
560		5	0	0	0	0	0	0	0		100.0%

7d Survival Rate Detail

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1	1	1	1	1
56		1	1	1	1	0.8
100		1	0.8	1	1	1
180		0.8	0.8	1	0.6	0.6
320		0.4	0.4	0	0.2	0.2
560		0	0	0	0	0

Mean Dry Biomass-mg Detail

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.24	1.08	0.662	0.974	0.858
56		0.778	0.834	0.702	0.646	0.7
100		0.846	0.746	0.958	0.91	0.9
180		0.646	0.816	0.72	0.482	0.53
320		0.314	0.254	0	0.21	0.116
560		0	0	0	0	0

7d Survival Rate Binomials

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	5/5	5/5	5/5	5/5	5/5
56		5/5	5/5	5/5	5/5	4/5
100		5/5	4/5	5/5	5/5	5/5
180		4/5	4/5	5/5	3/5	3/5
320		2/5	2/5	0/5	1/5	1/5
560		0/5	0/5	0/5	0/5	0/5

CETIS Analytical Report

Report Date: 26 Sep-14 13:32 (p 1 of 4)
Test Code: TOPS090914 | 02-7160-5944

Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	10-5656-1319	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	26 Sep-14 13:32	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Sample ID:	16-8181-1283	**Code:**	TOPS090914	**Client:**	ABC Labs
Sample Date:	09 Sep-14 13:24	**Material:**	Copper chloride	**Project:**	REF TOX
Receive Date:		**Source:**	Reference Toxicant		
Sample Age:	NA	**Station:**	REF TOX		

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA	17.2%	100	180	134.2	

Dunnett Multiple Comparison Test

Control vs	C-µg/L	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Negative Control	56	0.5442	2.305	0.202	8	0.5840	CDF	Non-Significant Effect
	100	0.5442	2.305	0.202	8	0.5840	CDF	Non-Significant Effect
	180*	3.187	2.305	0.202	8	0.0079	CDF	Significant Effect
	320*	9.607	2.305	0.202	8	<0.0001	CDF	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2.470433	0.6176083	4	32.25	<0.0001	Significant Effect
Error	0.3829912	0.01914956	20			
Total	2.853424		24			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	2.1	4.893	0.1315	Equal Variances
Variances	Levene Equality of Variance	3.066	4.431	0.0402	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.8974	0.8877	0.0161	Normal Distribution
Distribution	Kolmogorov-Smirnov D	0.2331	0.2018	0.0012	Non-normal Distribution
Distribution	D'Agostino Skewness	0.6619	2.576	0.5080	Normal Distribution
Distribution	D'Agostino Kurtosis	0.8414	2.576	0.4001	Normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	1.146	9.21	0.5638	Normal Distribution
Distribution	Anderson-Darling A2 Normality	1.555	3.878	<0.0001	Non-normal Distribution

7d Survival Rate Summary

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	5	1	1	1	1	1	1	0	0.0%	0.0%
56		5	0.96	0.8489	1	1	0.8	1	0.04	9.32%	4.0%
100		5	0.96	0.8489	1	1	0.8	1	0.04	9.32%	4.0%
180		5	0.76	0.5522	0.9678	0.8	0.6	1	0.07483	22.02%	24.0%
320		5	0.24	0.03223	0.4478	0.2	0	0.4	0.07483	69.72%	76.0%
560		5	0	0	0	0	0	0	0		100.0%

Angular (Corrected) Transformed Summary

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Contr	5	1.345	1.345	1.346	1.345	1.345	1.345	0	0.0%	0.0%
56		5	1.298	1.165	1.43	1.345	1.107	1.345	0.04763	8.21%	3.54%
100		5	1.298	1.165	1.43	1.345	1.107	1.345	0.04763	8.21%	3.54%
180		5	1.066	0.829	1.304	1.107	0.8861	1.345	0.08548	17.92%	20.73%
320		5	0.5044	0.2671	0.7418	0.4636	0.2255	0.6847	0.08548	37.89%	62.5%
560		5	0.2255	0.2255	0.2256	0.2255	0.2255	0.2255	0	0.0%	83.24%

Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	10-5656-1319	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	26 Sep-14 13:32	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

7d Survival Rate Detail

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1	1	1	1	1
56		1	1	1	1	0.8
100		1	0.8	1	1	1
180		0.8	0.8	1	0.6	0.6
320		0.4	0.4	0	0.2	0.2
560		0	0	0	0	0

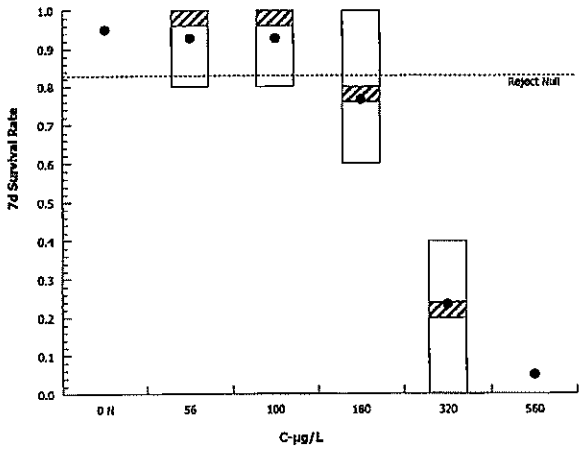
Angular (Corrected) Transformed Detail

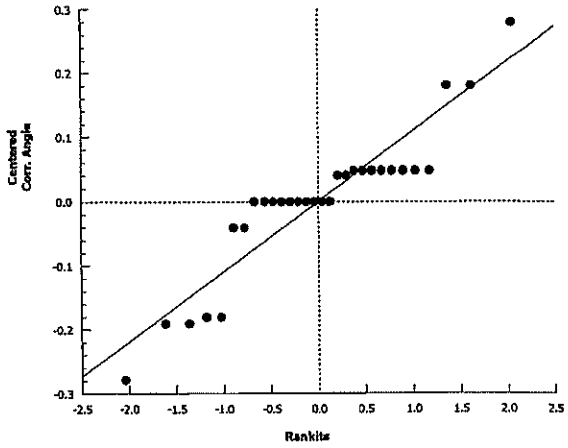
C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.345	1.345	1.345	1.345	1.345
56		1.345	1.345	1.345	1.345	1.107
100		1.345	1.107	1.345	1.345	1.345
180		1.107	1.107	1.345	0.8861	0.8861
320		0.6847	0.6847	0.2255	0.4636	0.4636
560		0.2255	0.2255	0.2255	0.2255	0.2255

7d Survival Rate Binomials

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	5/5	5/5	5/5	5/5	5/5
56		5/5	5/5	5/5	5/5	4/5
100		5/5	4/5	5/5	5/5	5/5
180		4/5	4/5	5/5	3/5	3/5
320		2/5	2/5	0/5	1/5	1/5
560		0/5	0/5	0/5	0/5	0/5

Graphics





Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	19-6344-0688	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.7
Analyzed:	26 Sep-14 13:32	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Sample ID:	16-8181-1283	**Code:**	TOPS090914	**Client:**	ABC Labs
Sample Date:	09 Sep-14 13:24	**Material:**	Copper chloride	**Project:**	REF TOX
Receive Date:		**Source:**	Reference Toxicant		
Sample Age:	NA	**Station:**	REF TOX		

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	20.7%	100	180	134.2	

Dunnett Multiple Comparison Test

Control	vs	C-µg/L	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Negative Control		56*	2.663	2.305	0.2	8	0.0244	CDF	Significant Effect
		100	1.048	2.305	0.2	8	0.3608	CDF	Non-Significant Effect
		180*	3.739	2.305	0.2	8	0.0023	CDF	Significant Effect
		320*	9.047	2.305	0.2	8	<0.0001	CDF	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.86197	0.4654925	4	24.8	<0.0001	Significant Effect
Error	0.3754704	0.01877352	20			
Total	2.237441		24			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	5.703	13.28	0.2224	Equal Variances
Variances	Mod Levene Equality of Variance	2.449	4.893	0.0914	Equal Variances
Variances	Levene Equality of Variance	1.69	4.431	0.1917	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9904	0.8877	0.9965	Normal Distribution
Distribution	Kolmogorov-Smirnov D	0.08295	0.2018	1.0000	Normal Distribution
Distribution	D'Agostino Skewness	0.4428	2.576	0.6579	Normal Distribution
Distribution	D'Agostino Kurtosis	0.7974	2.576	0.4252	Normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	0.8319	9.21	0.6597	Normal Distribution
Distribution	Anderson-Darling A2 Normality	0.1725	3.878	0.9835	Normal Distribution

Mean Dry Biomass-mg Summary

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	5	0.9628	0.6906	1.235	0.974	0.662	1.24	0.09802	22.77%	0.0%
56		5	0.732	0.6403	0.8237	0.702	0.646	0.834	0.03305	10.09%	23.97%
100		5	0.872	0.7716	0.9724	0.9	0.746	0.958	0.03618	9.28%	9.43%
180		5	0.6388	0.4694	0.8082	0.646	0.482	0.816	0.06102	21.36%	33.65%
320		5	0.1788	0.02569	0.3319	0.21	0	0.314	0.05515	68.96%	81.43%
560		5	0	0	0	0	0	0	0		100.0%

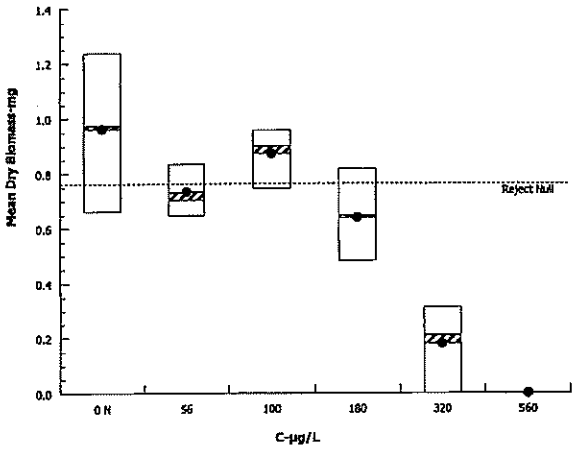
Mean Dry Biomass-mg Detail

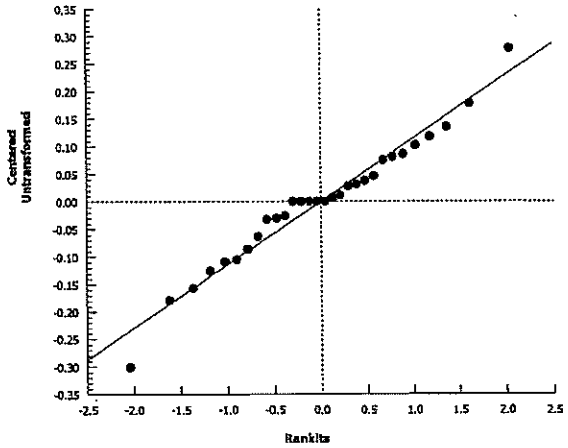
C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.24	1.08	0.662	0.974	0.858
56		0.778	0.834	0.702	0.646	0.7
100		0.846	0.746	0.958	0.91	0.9
180		0.646	0.816	0.72	0.482	0.53
320		0.314	0.254	0	0.21	0.116
560		0	0	0	0	0

Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	19-6344-0688	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.7
Analyzed:	26 Sep-14 13:32	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Graphics





CETIS Analytical Report

Report Date: 26 Sep-14 13:32 (p 1 of 3)
Test Code: TOPS090914 | 02-7160-5944

Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	11-7452-5276	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	26 Sep-14 13:32	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Sample ID:	16-8181-1283	**Code:**	TOPS090914	**Client:**	ABC Labs
Sample Date:	09 Sep-14 13:24	**Material:**	Copper chloride	**Project:**	REF TOX
Receive Date:		**Source:**	Reference Toxicant		
Sample Age:	NA	**Station:**	REF TOX		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

Point Estimates

Level	µg/L	95% LCL	95% UCL
EC5	104	0.5	135.5
EC10	124	71.5	188
EC15	144	108	210.1
EC20	164	121.3	220.3
EC25	182.7	134.7	228.2
EC40	223.1	177.6	263.5
EC50	250	211.8	287.5

7d Survival Rate Summary

			Calculated Variate(A/B)								
C-µg/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Negative Control	5	1	1	1	0	0	0.0%	0.0%	25	25
56		5	0.96	0.8	1	0.04	0.08944	9.32%	4.0%	24	25
100		5	0.96	0.8	1	0.04	0.08944	9.32%	4.0%	24	25
180		5	0.76	0.6	1	0.07483	0.1673	22.02%	24.0%	19	25
320		5	0.24	0	0.4	0.07483	0.1673	69.72%	76.0%	6	25
560		5	0	0	0	0	0		100.0%	0	25

7d Survival Rate Detail

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1	1	1	1	1
56		1	1	1	1	0.8
100		1	0.8	1	1	1
180		0.8	0.8	1	0.6	0.6
320		0.4	0.4	0	0.2	0.2
560		0	0	0	0	0

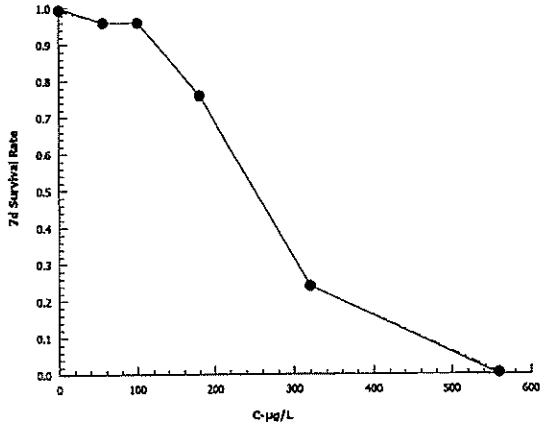
7d Survival Rate Binomials

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	5/5	5/5	5/5	5/5	5/5
56		5/5	5/5	5/5	5/5	4/5
100		5/5	4/5	5/5	5/5	5/5
180		4/5	4/5	5/5	3/5	3/5
320		2/5	2/5	0/5	1/5	1/5
560		0/5	0/5	0/5	0/5	0/5

Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	11-7452-5276	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	26 Sep-14 13:32	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Graphics



Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	10-1233-9042	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.7
Analyzed:	26 Sep-14 13:32	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Sample ID:	16-8181-1283	**Code:**	TOPS090914	**Client:**	ABC Labs
Sample Date:	09 Sep-14 13:24	**Material:**	Copper chloride	**Project:**	REF TOX
Receive Date:		**Source:**	Reference Toxicant		
Sample Age:	NA	**Station:**	REF TOX		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	863614	280	Yes	Two-Point Interpolation

Point Estimates

Level	µg/L	95% LCL	95% UCL
IC5	16.77	5.952	167
IC10	33.53	11.9	190.6
IC15	50.3	17.85	233.6
IC20	115.6	N/A	224.1
IC25	139.2	2.087	228.3
IC40	198.6	118.2	253.1
IC50	227.9	166.3	278.6

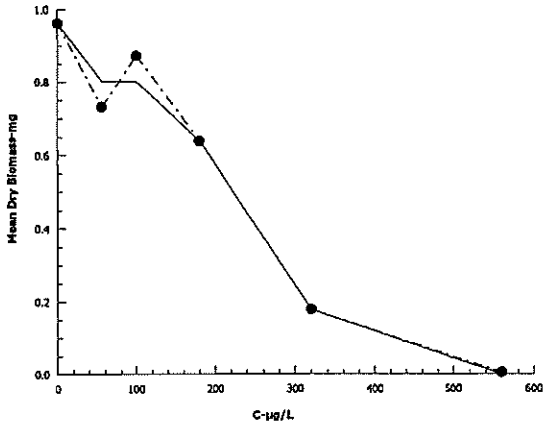
Mean Dry Biomass-mg Summary

			Calculated Variate						
C-µg/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	0.9628	0.662	1.24	0.09802	0.2192	22.77%	0.0%
56		5	0.732	0.646	0.834	0.03305	0.07389	10.09%	23.97%
100		5	0.872	0.746	0.958	0.03618	0.08089	9.28%	9.43%
180		5	0.6388	0.482	0.816	0.06102	0.1364	21.36%	33.65%
320		5	0.1788	0	0.314	0.05515	0.1233	68.96%	81.43%
560		5	0	0	0	0	0		100.0%

Mean Dry Biomass-mg Detail

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.24	1.08	0.662	0.974	0.858
56		0.778	0.834	0.702	0.646	0.7
100		0.846	0.746	0.958	0.91	0.9
180		0.646	0.816	0.72	0.482	0.53
320		0.314	0.254	0	0.21	0.116
560		0	0	0	0	0

Graphics



CETIS Measurement Report

Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Batch ID:	00-5888-3277	**Test Type:**	Growth-Survival (7d)	**Analyst:**	
Start Date:	09 Sep-14 13:24	**Protocol:**	EPA/600/R-95/136 (1995)	**Diluent:**	Laboratory Seawater
Ending Date:	16 Sep-14 11:30	**Species:**	Atherinops affinis	**Brine:**	Not Applicable
Duration:	6d 22h	**Source:**	Aquatic Biosystems, CO	**Age:**	

Sample ID:	16-8181-1283	**Code:**	TOPS090914	**Client:**	ABC Labs
Sample Date:	09 Sep-14 13:24	**Material:**	Copper chloride	**Project:**	REF TOX
Receive Date:		**Source:**	Reference Toxicant		
Sample Age:	NA	**Station:**	REF TOX		

Dissolved Oxygen-mg/L

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	8	6.8	6.39	7.21	5.7	7.2	0.1732	0.4899	7.2%	0
56		8	6.625	6.155	7.095	5.9	7.3	0.1989	0.5625	8.49%	0
100		8	6.675	6.254	7.096	6.1	7.4	0.178	0.5036	7.54%	0
180		8	6.688	6.277	7.098	6	7.4	0.1737	0.4912	7.35%	0
320		8	6.575	6.09	7.06	5.6	7.3	0.2051	0.58	8.82%	0
560		2	6.9	1.818	11.98	6.5	7.3	0.4	0.5657	8.2%	0
Overall		42	6.71			5.6	7.4				0 (0%)

pH-Units

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	8	7.563	7.5	7.625	7.4	7.6	0.0263	0.0744	0.98%	0
56		8	7.55	7.473	7.627	7.4	7.7	0.03273	0.09258	1.23%	0
100		8	7.55	7.487	7.613	7.5	7.7	0.02673	0.07559	1.0%	0
180		8	7.55	7.487	7.613	7.5	7.7	0.02673	0.07559	1.0%	0
320		8	7.525	7.466	7.584	7.4	7.6	0.025	0.07071	0.94%	0
560		2	7.6	7.594	7.606	7.6	7.6	0	0	0.0%	0
Overall		42	7.556			7.4	7.7				0 (0%)

Salinity-ppt

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	8	34	34	34	34	34	0	0	0.0%	0
56		8	34	34	34	34	34	0	0	0.0%	0
100		8	34	34	34	34	34	0	0	0.0%	0
180		8	34	34	34	34	34	0	0	0.0%	0
320		8	34	34	34	34	34	0	0	0.0%	0
560		2	34	34	34	34	34	0	0	0.0%	0
Overall		42	34			34	34				0 (0%)

Temperature-°C

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	8	21	21	21	21	21	0	0	0.0%	0
56		8	21	21	21	21	21	0	0	0.0%	0
100		8	21	21	21	21	21	0	0	0.0%	0
180		8	21	21	21	21	21	0	0	0.0%	0
320		8	21	21	21	21	21	0	0	0.0%	0
560		2	21	21	21	21	21	0	0	0.0%	0
Overall		42	21			21	21				0 (0%)

Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Dissolved Oxygen-mg/L

C-µg/L	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	7.1	6.6	7	7.2	7.1	7	6.7	5.7
56		7.3	6.9	6.9	5.9	7	7	6.1	5.9
100		7.4	6.9	6.9	6.1	7	6.9	6.1	6.1
180		7.4	6.9	6.9	6	7	6.9	6.2	6.2
320		7.3	6.9	6.7	5.6	7	6.9	6.2	6
560		7.3	6.5						

pH-Units

C-µg/L	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	7.6	7.5	7.6	7.6	7.6	7.6	7.6	7.4
56		7.7	7.6	7.5	7.4	7.6	7.6	7.5	7.5
100		7.7	7.5	7.5	7.5	7.6	7.6	7.5	7.5
180		7.7	7.5	7.5	7.5	7.6	7.6	7.5	7.5
320		7.6	7.5	7.5	7.4	7.6	7.6	7.5	7.5
560		7.6	7.6						

Salinity-ppt

C-µg/L	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	34	34	34	34	34	34	34	34
56		34	34	34	34	34	34	34	34
100		34	34	34	34	34	34	34	34
180		34	34	34	34	34	34	34	34
320		34	34	34	34	34	34	34	34
560		34	34						

Temperature-°C

C-µg/L	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	21	21	21	21	21	21	21	21
56		21	21	21	21	21	21	21	21
100		21	21	21	21	21	21	21	21
180		21	21	21	21	21	21	21	21
320		21	21	21	21	21	21	21	21
560		21	21						

aquatic bioassay & consulting laboratories, inc

CHRONIC KELP GERMINATION & GROWTH BIOASSAY

DATE: 11 September - 14

STANDARD TOXICANT: Copper Chloride

ENDPOINT: GERMINATION

NOEC = 32.00 ug/l

EC25 = 117.90 ug/l
EC50 = 138.60 ug/l

ENDPOINT: GROWTH-LENGTH

NOEC = 100.00 ug/l

IC25 = 119.90 ug/l
IC50 = 139.90 ug/l

Yours very truly,

Scott Johnson
Laboratory Director

29 north olive st. ventura, ca 93001 (805) 643 5621 www.aquabio.org

CETIS Summary Report

Report Date: 29 Sep-14 12:29 (p 1 of 2)
Test Code: KLP091114 | 03-7688-4712

Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Batch ID:	05-5423-7336	**Test Type:**	Growth-Germination	**Analyst:**	
Start Date:	11 Sep-14 16:20	**Protocol:**	EPA/600/R-95/136 (1995)	**Diluent:**	Laboratory Seawater
Ending Date:	13 Sep-14 16:20	**Species:**	Macrocystis pyrifera	**Brine:**	Not Applicable
Duration:	48h	**Source:**	David Gutoff	**Age:**	

Sample ID:	01-9102-9043	**Code:**	KLP091114	**Client:**	Internal Lab
Sample Date:	11 Sep-14 16:20	**Material:**	Copper chloride	**Project:**	
Receive Date:		**Source:**	Reference Toxicant		
Sample Age:	NA	**Station:**	REF TOX		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
19-7080-7128	Germination Rate	32	100	56.57	2.82%		Dunnett Multiple Comparison Test
21-3921-7408	Mean Length	100	180	134.2	3.84%		Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	µg/L	95% LCL	95% UCL	TU	Method
15-9267-7510	Germination Rate	EC5	101.3	73.93	103.7		Linear Interpolation (ICPIN)
		EC10	105.4	102.5	107.8		
		EC15	109.6	106.8	111.8		
		EC20	113.7	111.1	115.8		
		EC25	117.9	115.4	119.8		
		EC40	130.3	128.3	131.8		
		EC50	138.6	136.9	139.9		
17-6712-8670	Mean Length	IC5	103.8	100.7	104.1		Linear Interpolation (ICPIN)
		IC10	107.8	104.9	108.1		
		IC15	111.8	109.1	112.1		
		IC20	115.9	113.3	116.1		
		IC25	119.9	117.4	120.1		
		IC40	131.9	129.9	132.1		
		IC50	139.9	138.3	140		

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
15-9267-7510	Germination Rate	Control Resp	0.93	0.7 - NL	Yes	Passes Acceptability Criteria
19-7080-7128	Germination Rate	Control Resp	0.93	0.7 - NL	Yes	Passes Acceptability Criteria
17-6712-8670	Mean Length	Control Resp	14.68	10 - NL	Yes	Passes Acceptability Criteria
21-3921-7408	Mean Length	Control Resp	14.68	10 - NL	Yes	Passes Acceptability Criteria
21-3921-7408	Mean Length	NOEL	100	NL - 35	No	Above Acceptability Criteria
19-7080-7128	Germination Rate	PMSD	0.02825	NL - 0.2	No	Passes Acceptability Criteria
21-3921-7408	Mean Length	PMSD	0.03837	NL - 0.2	No	Passes Acceptability Criteria

Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Germination Rate Summary

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	0.93	0.9009	0.9591	0.9	0.95	0.01049	0.02345	2.52%	0.0%
5.6		5	0.922	0.9016	0.9424	0.9	0.94	0.007348	0.01643	1.78%	0.86%
10		5	0.914	0.8998	0.9282	0.9	0.93	0.005099	0.0114	1.25%	1.72%
18		5	0.922	0.9116	0.9324	0.91	0.93	0.003742	0.008367	0.91%	0.86%
32		5	0.926	0.8988	0.9532	0.9	0.96	0.009798	0.02191	2.37%	0.43%
100		5	0.898	0.8726	0.9234	0.88	0.93	0.009165	0.02049	2.28%	3.44%
180		5	0	0	0	0	0	0	0		100.0%
320		5	0	0	0	0	0	0	0		100.0%

Mean Length Summary

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	14.68	14.21	15.15	14.1	15	0.1685	0.3768	2.57%	0.0%
5.6		5	14.9	14.55	15.25	14.6	15.2	0.1265	0.2828	1.9%	-1.5%
10		5	15.22	14.71	15.73	14.7	15.6	0.1828	0.4087	2.69%	-3.68%
18		5	14.82	14.66	14.98	14.7	15	0.05831	0.1304	0.88%	-0.95%
32		5	14.98	14.42	15.54	14.4	15.4	0.201	0.4494	3.0%	-2.04%
100		5	14.9	14.29	15.51	14.4	15.7	0.2214	0.495	3.32%	-1.5%
180		5	0	0	0	0	0	0	0		100.0%
320		5	0	0	0	0	0	0	0		100.0%

Germination Rate Detail

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	0.9	0.95	0.94	0.95	0.91
5.6		0.93	0.94	0.91	0.93	0.9
10		0.93	0.91	0.9	0.92	0.91
18		0.91	0.93	0.93	0.92	0.92
32		0.92	0.96	0.93	0.92	0.9
100		0.88	0.9	0.93	0.9	0.88
180		0	0	0	0	0
320		0	0	0	0	0

Mean Length Detail

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	14.9	14.5	14.9	15	14.1
5.6		14.8	14.7	15.2	14.6	15.2
10		15.6	14.7	15.3	14.9	15.6
18		14.9	14.7	14.7	15	14.8
32		14.4	14.6	15.4	15.2	15.3
100		15.7	14.4	14.7	15	14.7
180		0	0	0	0	0
320		0	0	0	0	0

Germination Rate Binomials

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	90/100	95/100	94/100	95/100	91/100
5.6		93/100	94/100	91/100	93/100	90/100
10		93/100	91/100	90/100	92/100	91/100
18		91/100	93/100	93/100	92/100	92/100
32		92/100	96/100	93/100	92/100	90/100
100		88/100	90/100	93/100	90/100	88/100
180		0/100	0/100	0/100	0/100	0/100
320		0/100	0/100	0/100	0/100	0/100

CETIS Analytical Report

Report Date: 29 Sep-14 12:28 (p 1 of 4)
Test Code: KLP091114 | 03-7688-4712

Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	19-7080-7128	**Endpoint:**	Germination Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	29 Sep-14 12:28	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Sample ID:	01-9102-9043	**Code:**	KLP091114	**Client:**	Internal Lab
Sample Date:	11 Sep-14 16:20	**Material:**	Copper chloride	**Project:**	
Receive Date:		**Source:**	Reference Toxicant		
Sample Age:	NA	**Station:**	REF TOX		

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA	2.82%	32	100	56.57	

Dunnett Multiple Comparison Test

Control	vs	C-µg/L	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Negative Control		5.6	0.7905	2.362	0.050	8	0.5153	CDF	Non-Significant Effect
		10	1.503	2.362	0.050	8	0.2228	CDF	Non-Significant Effect
		18	0.8307	2.362	0.050	8	0.4968	CDF	Non-Significant Effect
		32	0.369	2.362	0.050	8	0.7023	CDF	Non-Significant Effect
		100*	2.749	2.362	0.050	8	0.0223	CDF	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.01090548	0.002181096	5	1.909	0.1302	Non-Significant Effect
Error	0.02742469	0.001142696	24			
Total	0.03833017		29			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	5.655	15.09	0.3412	Equal Variances
Variances	Mod Levene Equality of Variance	0.8509	4.248	0.5320	Equal Variances
Variances	Levene Equality of Variance	1.541	3.895	0.2147	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.986	0.9031	0.9532	Normal Distribution
Distribution	Kolmogorov-Smirnov D	0.08443	0.1853	0.9244	Normal Distribution
Distribution	D'Agostino Skewness	0.7075	2.576	0.4793	Normal Distribution
Distribution	D'Agostino Kurtosis	0.009968	2.576	0.9920	Normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	0.5006	9.21	0.7786	Normal Distribution
Distribution	Anderson-Darling A2 Normality	0.1683	3.878	0.9885	Normal Distribution

Germination Rate Summary

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	5	0.93	0.9009	0.9591	0.94	0.9	0.95	0.01049	2.52%	0.0%
5.6		5	0.922	0.9016	0.9424	0.93	0.9	0.94	0.007348	1.78%	0.86%
10		5	0.914	0.8998	0.9282	0.91	0.9	0.93	0.005099	1.25%	1.72%
18		5	0.922	0.9116	0.9324	0.92	0.91	0.93	0.003741	0.91%	0.86%
32		5	0.926	0.8988	0.9532	0.92	0.9	0.96	0.009798	2.37%	0.43%
100		5	0.898	0.8726	0.9234	0.9	0.88	0.93	0.009165	2.28%	3.44%
180		5	0	0	0	0	0	0	0		100.0%
320		5	0	0	0	0	0	0	0		100.0%

Angular (Corrected) Transformed Summary

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Contr	5	1.306	1.25	1.362	1.323	1.249	1.345	0.02028	3.47%	0.0%
5.6		5	1.289	1.251	1.327	1.303	1.249	1.323	0.01359	2.36%	1.29%
10		5	1.274	1.248	1.299	1.266	1.249	1.303	0.009194	1.61%	2.46%
18		5	1.288	1.269	1.307	1.284	1.266	1.303	0.006938	1.2%	1.36%
32		5	1.298	1.243	1.353	1.284	1.249	1.369	0.01989	3.43%	0.6%
100		5	1.247	1.203	1.291	1.249	1.217	1.303	0.01572	2.82%	4.5%
180		5	0.05002	0.05001	0.05003	0.05002	0.05002	0.05002	0	0.0%	96.17%
320		5	0.05002	0.05001	0.05003	0.05002	0.05002	0.05002	0	0.0%	96.17%

Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	19-7080-7128	**Endpoint:**	Germination Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	29 Sep-14 12:28	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Germination Rate Detail

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	0.9	0.95	0.94	0.95	0.91
5.6		0.93	0.94	0.91	0.93	0.9
10		0.93	0.91	0.9	0.92	0.91
18		0.91	0.93	0.93	0.92	0.92
32		0.92	0.96	0.93	0.92	0.9
100		0.88	0.9	0.93	0.9	0.88
180		0	0	0	0	0
320		0	0	0	0	0

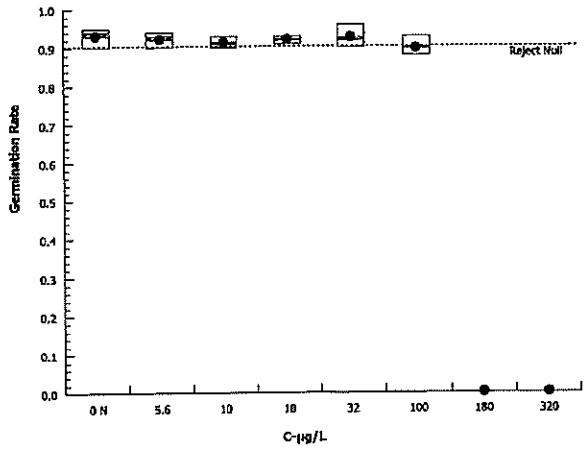
Angular (Corrected) Transformed Detail

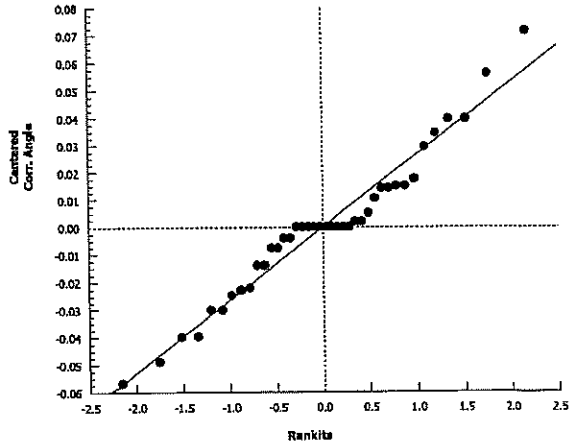
C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.249	1.345	1.323	1.345	1.266
5.6		1.303	1.323	1.266	1.303	1.249
10		1.303	1.266	1.249	1.284	1.266
18		1.266	1.303	1.303	1.284	1.284
32		1.284	1.369	1.303	1.284	1.249
100		1.217	1.249	1.303	1.249	1.217
180		0.05002	0.05002	0.05002	0.05002	0.05002
320		0.05002	0.05002	0.05002	0.05002	0.05002

Germination Rate Binomials

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	90/100	95/100	94/100	95/100	91/100
5.6		93/100	94/100	91/100	93/100	90/100
10		93/100	91/100	90/100	92/100	91/100
18		91/100	93/100	93/100	92/100	92/100
32		92/100	96/100	93/100	92/100	90/100
100		88/100	90/100	93/100	90/100	88/100
180		0/100	0/100	0/100	0/100	0/100
320		0/100	0/100	0/100	0/100	0/100

Graphics





Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	21-3921-7408	**Endpoint:**	Mean Length	**CETIS Version:**	CETISv1.8.7
Analyzed:	29 Sep-14 12:28	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Sample ID:	01-9102-9043	**Code:**	KLP091114	**Client:**	Internal Lab
Sample Date:	11 Sep-14 16:20	**Material:**	Copper chloride	**Project:**	
Receive Date:		**Source:**	Reference Toxicant		
Sample Age:	NA	**Station:**	REF TOX		

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	3.84%	100	180	134.2	

Dunnett Multiple Comparison Test

Control	vs	C-µg/L	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Negative Control		5.6	-0.9226	2.362	0.563	8	0.9794	CDF	Non-Significant Effect
		10	-2.264	2.362	0.563	8	0.9997	CDF	Non-Significant Effect
		18	-0.5871	2.362	0.563	8	0.9512	CDF	Non-Significant Effect
		32	-1.258	2.362	0.563	8	0.9921	CDF	Non-Significant Effect
		100	-0.9226	2.362	0.563	8	0.9794	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.8096672	0.1619334	5	1.139	0.3672	Non-Significant Effect
Error	3.412	0.1421667	24			
Total	4.221667		29			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	5.991	15.09	0.3071	Equal Variances
Variances	Mod Levene Equality of Variance	0.6604	4.248	0.6579	Equal Variances
Variances	Levene Equality of Variance	1.937	3.895	0.1252	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9643	0.9031	0.3976	Normal Distribution
Distribution	Kolmogorov-Smirnov D	0.106	0.1853	0.5201	Normal Distribution
Distribution	D'Agostino Skewness	0.1147	2.576	0.9087	Normal Distribution
Distribution	D'Agostino Kurtosis	0.4851	2.576	0.6276	Normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	0.2485	9.21	0.8832	Normal Distribution
Distribution	Anderson-Darling A2 Normality	0.4192	3.878	0.3313	Normal Distribution

Mean Length Summary

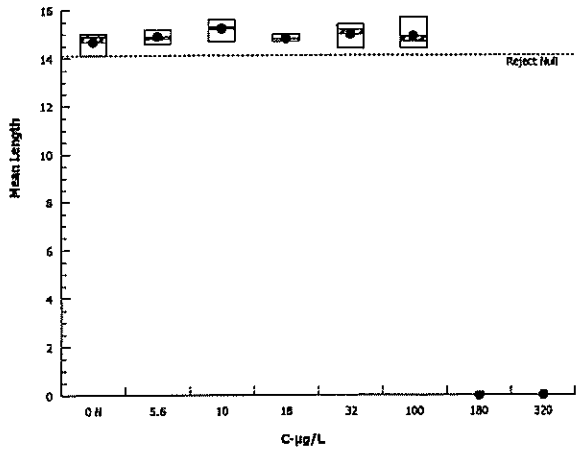
C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	5	14.68	14.21	15.15	14.9	14.1	15	0.1685	2.57%	0.0%
5.6		5	14.9	14.55	15.25	14.8	14.6	15.2	0.1265	1.9%	-1.5%
10		5	15.22	14.71	15.73	15.3	14.7	15.6	0.1828	2.69%	-3.68%
18		5	14.82	14.66	14.98	14.8	14.7	15	0.05831	0.88%	-0.95%
32		5	14.98	14.42	15.54	15.2	14.4	15.4	0.201	3.0%	-2.04%
100		5	14.9	14.29	15.51	14.7	14.4	15.7	0.2214	3.32%	-1.5%
180		5	0	0	0	0	0	0	0		100.0%
320		5	0	0	0	0	0	0	0		100.0%

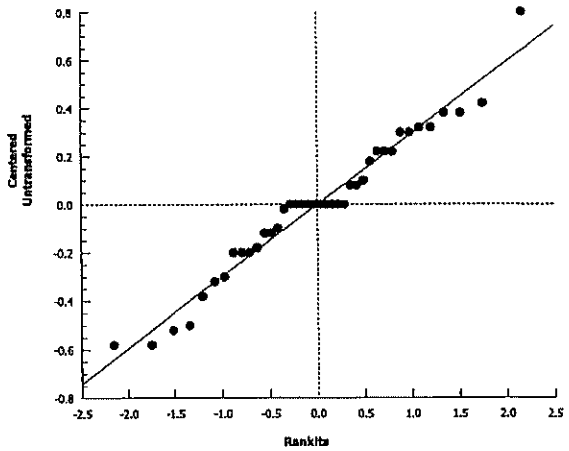
Mean Length Detail

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	14.9	14.5	14.9	15	14.1
5.6		14.8	14.7	15.2	14.6	15.2
10		15.6	14.7	15.3	14.9	15.6
18		14.9	14.7	14.7	15	14.8
32		14.4	14.6	15.4	15.2	15.3
100		15.7	14.4	14.7	15	14.7
180		0	0	0	0	0
320		0	0	0	0	0

Analysis ID:	21-3921-7408	**Endpoint:**	Mean Length	**CETIS Version:**	CETISv1.8.7
Analyzed:	29 Sep-14 12:28	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Graphics





CETIS Analytical Report

Report Date: 29 Sep-14 12:28 (p 1 of 4)
Test Code: KLP091114 | 03-7688-4712

Macrocystis Germination and Germ Tube Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	15-9267-7510	**Endpoint:**	Germination Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	29 Sep-14 12:28	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Sample ID:	01-9102-9043	**Code:**	KLP091114	**Client:**	Internal Lab
Sample Date:	11 Sep-14 16:20	**Material:**	Copper chloride	**Project:**	
Receive Date:		**Source:**	Reference Toxicant		
Sample Age:	NA	**Station:**	REF TOX		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

Point Estimates

Level	µg/L	95% LCL	95% UCL
EC5	101.3	73.93	103.7
EC10	105.4	102.5	107.8
EC15	109.6	106.8	111.8
EC20	113.7	111.1	115.8
EC25	117.9	115.4	119.8
EC40	130.3	128.3	131.8
EC50	138.6	136.9	139.9

Germination Rate Summary

			Calculated Variate(A/B)								
C-µg/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Negative Control	5	0.93	0.9	0.95	0.01049	0.02345	2.52%	0.0%	465	500
5.6		5	0.922	0.9	0.94	0.007348	0.01643	1.78%	0.86%	461	500
10		5	0.914	0.9	0.93	0.005099	0.0114	1.25%	1.72%	457	500
18		5	0.922	0.91	0.93	0.003741	0.008365	0.91%	0.86%	461	500
32		5	0.926	0.9	0.96	0.009798	0.02191	2.37%	0.43%	463	500
100		5	0.898	0.88	0.93	0.009165	0.02049	2.28%	3.44%	449	500
180		5	0	0	0	0	0		100.0%	0	500
320		5	0	0	0	0	0		100.0%	0	500

Germination Rate Detail

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	0.9	0.95	0.94	0.95	0.91
5.6		0.93	0.94	0.91	0.93	0.9
10		0.93	0.91	0.9	0.92	0.91
18		0.91	0.93	0.93	0.92	0.92
32		0.92	0.96	0.93	0.92	0.9
100		0.88	0.9	0.93	0.9	0.88
180		0	0	0	0	0
320		0	0	0	0	0

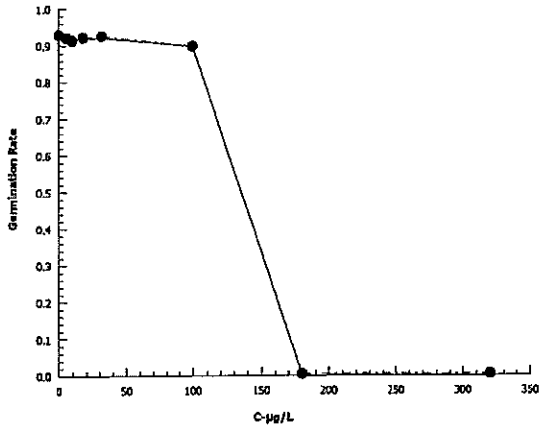
Germination Rate Binomials

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	90/100	95/100	94/100	95/100	91/100
5.6		93/100	94/100	91/100	93/100	90/100
10		93/100	91/100	90/100	92/100	91/100
18		91/100	93/100	93/100	92/100	92/100
32		92/100	96/100	93/100	92/100	90/100
100		88/100	90/100	93/100	90/100	88/100
180		0/100	0/100	0/100	0/100	0/100
320		0/100	0/100	0/100	0/100	0/100

Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	15-9267-7510	**Endpoint:**	Germination Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	29 Sep-14 12:28	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Graphics



Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	17-6712-8670	**Endpoint:**	Mean Length	**CETIS Version:**	CETISv1.8.7
Analyzed:	29 Sep-14 12:28	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Sample ID:	01-9102-9043	**Code:**	KLP091114	**Client:**	Internal Lab
Sample Date:	11 Sep-14 16:20	**Material:**	Copper chloride	**Project:**	
Receive Date:		**Source:**	Reference Toxicant		
Sample Age:	NA	**Station:**	REF TOX		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	138665	280	Yes	Two-Point Interpolation

Point Estimates

Level	µg/L	95% LCL	95% UCL
IC5	103.8	100.7	104.1
IC10	107.8	104.9	108.1
IC15	111.8	109.1	112.1
IC20	115.9	113.3	116.1
IC25	119.9	117.4	120.1
IC40	131.9	129.9	132.1
IC50	139.9	138.3	140

Mean Length Summary

			Calculated Variate						
C-µg/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	14.68	14.1	15	0.1685	0.3768	2.57%	0.0%
5.6		5	14.9	14.6	15.2	0.1265	0.2828	1.9%	-1.5%
10		5	15.22	14.7	15.6	0.1828	0.4087	2.69%	-3.68%
18		5	14.82	14.7	15	0.05831	0.1304	0.88%	-0.95%
32		5	14.98	14.4	15.4	0.201	0.4494	3.0%	-2.04%
100		5	14.9	14.4	15.7	0.2214	0.495	3.32%	-1.5%
180		5	0	0	0	0	0		100.0%
320		5	0	0	0	0	0		100.0%

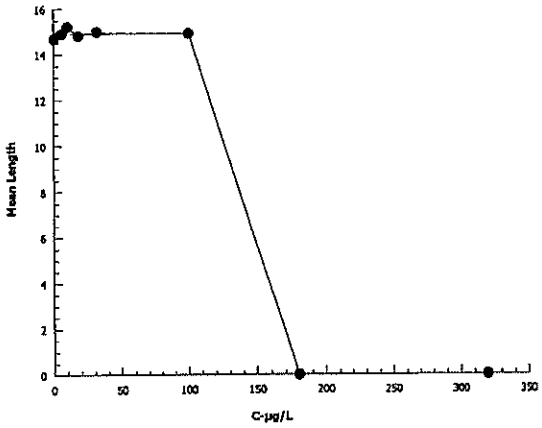
Mean Length Detail

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	14.9	14.5	14.9	15	14.1
5.6		14.8	14.7	15.2	14.6	15.2
10		15.6	14.7	15.3	14.9	15.6
18		14.9	14.7	14.7	15	14.8
32		14.4	14.6	15.4	15.2	15.3
100		15.7	14.4	14.7	15	14.7
180		0	0	0	0	0
320		0	0	0	0	0

Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	17-6712-8670	**Endpoint:**	Mean Length	**CETIS Version:**	CETISv1.8.7
Analyzed:	29 Sep-14 12:28	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Graphics



CETIS Measurement Report

Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Batch ID:	05-5423-7336	**Test Type:**	Growth-Germination	**Analyst:**	
Start Date:	11 Sep-14 16:20	**Protocol:**	EPA/600/R-95/136 (1995)	**Diluent:**	Laboratory Seawater
Ending Date:	13 Sep-14 16:20	**Species:**	Macrocystis pyrifera	**Brine:**	Not Applicable
Duration:	48h	**Source:**	David Gutoff	**Age:**	

Sample ID:	01-9102-9043	**Code:**	KLP091114	**Client:**	Internal Lab
Sample Date:	11 Sep-14 16:20	**Material:**	Copper chloride	**Project:**	
Receive Date:		**Source:**	Reference Toxicant		
Sample Age:	NA	**Station:**	REF TOX		

Dissolved Oxygen-mg/L

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	6.5	2.688	10.31	6.2	6.8	0.3	0.4243	6.53%	0
5.6		2	6.5	3.959	9.041	6.3	6.7	0.2	0.2828	4.35%	0
10		2	6.5	1.418	11.58	6.1	6.9	0.4	0.5657	8.7%	0
18		2	6.4	3.859	8.941	6.2	6.6	0.2	0.2828	4.42%	0
32		2	6.5	3.959	9.041	6.3	6.7	0.2	0.2828	4.35%	0
100		2	6.55	2.103	11	6.2	6.9	0.35	0.495	7.56%	0
180		2	6.55	3.373	9.727	6.3	6.8	0.25	0.3536	5.4%	0
320		2	6.5	2.688	10.31	6.2	6.8	0.3	0.4243	6.53%	0
Overall		16	6.5			6.1	6.9				0 (0%)

pH-Units

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
5.6		2	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
10		2	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
18		2	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
32		2	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
100		2	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
180		2	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
320		2	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
Overall		16	7.9			7.9	7.9				0 (0%)

Salinity-ppt

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	34	34	34	34	34	0	0	0.0%	0
5.6		2	34	34	34	34	34	0	0	0.0%	0
10		2	34	34	34	34	34	0	0	0.0%	0
18		2	34	34	34	34	34	0	0	0.0%	0
32		2	34	34	34	34	34	0	0	0.0%	0
100		2	34	34	34	34	34	0	0	0.0%	0
180		2	34	34	34	34	34	0	0	0.0%	0
320		2	34	34	34	34	34	0	0	0.0%	0
Overall		16	34			34	34				0 (0%)

Temperature-°C

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	14.7	13.43	15.97	14.6	14.8	0.09999	0.1414	0.96%	0
5.6		2	14.7	13.43	15.97	14.6	14.8	0.09999	0.1414	0.96%	0
10		2	14.7	13.43	15.97	14.6	14.8	0.09999	0.1414	0.96%	0
18		2	14.7	13.43	15.97	14.6	14.8	0.09999	0.1414	0.96%	0
32		2	14.7	13.43	15.97	14.6	14.8	0.09999	0.1414	0.96%	0
100		2	14.7	13.43	15.97	14.6	14.8	0.09999	0.1414	0.96%	0
180		2	14.7	13.43	15.97	14.6	14.8	0.09999	0.1414	0.96%	0
320		2	14.7	13.43	15.97	14.6	14.8	0.09999	0.1414	0.96%	0
Overall		16	14.7			14.6	14.8				0 (0%)

Dissolved Oxygen-mg/L

C-µg/L	Control Type	1	2
0	Negative Contr	6.8	6.2
5.6		6.7	6.3
10		6.9	6.1
18		6.6	6.2
32		6.7	6.3
100		6.9	6.2
180		6.8	6.3
320		6.8	6.2

pH-Units

C-µg/L	Control Type	1	2
0	Negative Contr	7.9	7.9
5.6		7.9	7.9
10		7.9	7.9
18		7.9	7.9
32		7.9	7.9
100		7.9	7.9
180		7.9	7.9
320		7.9	7.9

Salinity-ppt

C-µg/L	Control Type	1	2
0	Negative Contr	34	34
5.6		34	34
10		34	34
18		34	34
32		34	34
100		34	34
180		34	34
320		34	34

Temperature-°C

C-µg/L	Control Type	1	2
0	Negative Contr	14.6	14.8
5.6		14.6	14.8
10		14.6	14.8
18		14.6	14.8
32		14.6	14.8
100		14.6	14.8
180		14.6	14.8
320		14.6	14.8

aquatic bioassay & consulting laboratories, inc

CHRONIC ABALONE DEVELOPMENT BIOASSAY

DATE: 11 September 2014

STANDARD TOXICANT: Zinc

NOEC = 56.00 ug/l

EC25 = 65.26 ug/l
EC50 = 76.84 ug/l

Yours very truly,

Scott Johnson
Laboratory Director

29 north olive st. ventura, ca 93001 (805) 643 5621 www.aquabio.org

CETIS Summary Report

Report Date: 29 Sep-14 11:35 (p 1 of 1)
Test Code: ABS091114 | 03-8285-2263

Red Abalone Larval Development Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Batch ID:	04-4233-3821	**Test Type:**	Development	**Analyst:**	
Start Date:	11 Sep-14 12:30	**Protocol:**	EPA/600/R-95/136 (1995)	**Diluent:**	Laboratory Seawater
Ending Date:	13 Sep-14 12:30	**Species:**	Haliotis rufescens	**Brine:**	Not Applicable
Duration:	48h	**Source:**	Cultured Abalone	**Age:**	

Sample ID:	06-4301-8044	**Code:**	ABS091114	**Client:**	Internal Lab
Sample Date:	11 Sep-14 12:30	**Material:**	Zinc	**Project:**	REF TOX
Receive Date:		**Source:**	Reference Toxicant		
Sample Age:	NA	**Station:**	REF TOX		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
11-6461-9371	Proportion Normal	56	100	74.83	3.01%		Steel Many-One Rank Sum Test

Point Estimate Summary

Analysis ID	Endpoint	Level	µg/L	95% LCL	95% UCL	TU	Method
00-1027-5282	Proportion Normal	EC5	56	35.79	59.3		Linear Interpolation (ICPIN)
		EC10	58.32	50.42	61.44		
		EC15	60.63	56.37	63.58		
		EC20	62.95	58.93	65.73		
		EC25	65.26	61.5	67.87		
		EC40	72.21	69.2	74.29		
		EC50	76.84	74.33	78.58		

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
00-1027-5282	Proportion Normal	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria
11-6461-9371	Proportion Normal	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria
11-6461-9371	Proportion Normal	NOEL	56	NL - 56	No	Above Acceptability Criteria
11-6461-9371	Proportion Normal	PMSD	0.03009	NL - 0.2	No	Passes Acceptability Criteria

Proportion Normal Summary

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	1	1	1	1	1	0	0	0.0%	0.0%
18		5	1	1	1	1	1	0	0	0.0%	0.0%
32		5	1	1	1	1	1	0	0	0.0%	0.0%
56		5	0.95	0.8522	1	0.82	1	0.03521	0.07874	8.29%	5.0%
100		5	0	0	0	0	0	0	0		100.0%
180		5	0	0	0	0	0	0	0		100.0%

Proportion Normal Detail

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1	1	1	1	1
18		1	1	1	1	1
32		1	1	1	1	1
56		0.93	0.82	1	1	1
100		0	0	0	0	0
180		0	0	0	0	0

Proportion Normal Binomials

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	100/100	100/100	100/100	100/100	100/100
18		100/100	100/100	100/100	100/100	100/100
32		100/100	100/100	100/100	100/100	100/100
56		93/100	82/100	100/100	100/100	100/100
100		0/100	0/100	0/100	0/100	0/100
180		0/100	0/100	0/100	0/100	0/100

CETIS Analytical Report

Report Date: 29 Sep-14 11:35 (p 1 of 2)
Test Code: ABS091114 | 03-8285-2263

Red Abalone Larval Development Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	11-6461-9371	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.8.7
Analyzed:	29 Sep-14 11:34	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Sample ID:	06-4301-8044	**Code:**	ABS091114	**Client:**	Internal Lab
Sample Date:	11 Sep-14 12:30	**Material:**	Zinc	**Project:**	REF TOX
Receive Date:		**Source:**	Reference Toxicant		
Sample Age:	NA	**Station:**	REF TOX		

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA	3.01%	56	100	74.83	

Steel Many-One Rank Sum Test

Control	vs	C-µg/L	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Negative Control		18	27.5	17	1	8	0.7500	Asymp	Non-Significant Effect
		32	27.5	17	1	8	0.7500	Asymp	Non-Significant Effect
		56	22.5	17	1	8	0.3045	Asymp	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.05506188	0.01835396	3	2.356	0.1103	Non-Significant Effect
Error	0.1246394	0.007789963	16			
Total	0.1797013		19			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	2.59	5.953	0.1013	Equal Variances
Variances	Levene Equality of Variance	22.35	5.292	<0.0001	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.6506	0.866	<0.0001	Non-normal Distribution
Distribution	Kolmogorov-Smirnov D	0.4	0.2235	<0.0001	Non-normal Distribution
Distribution	D'Agostino Skewness	2.848	2.576	0.0044	Non-normal Distribution
Distribution	D'Agostino Kurtosis	3.126	2.576	0.0018	Non-normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	17.88	9.21	0.0001	Non-normal Distribution
Distribution	Anderson-Darling A2 Normality	3.787	3.878	<0.0001	Non-normal Distribution

Proportion Normal Summary

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	5	1	1	1	1	1	1	0	0.0%	0.0%
18		5	1	1	1	1	1	1	0	0.0%	0.0%
32		5	1	1	1	1	1	1	0	0.0%	0.0%
56		5	0.95	0.8522	1	1	0.82	1	0.03521	8.29%	5.0%
100		5	0	0	0	0	0	0	0		100.0%
180		5	0	0	0	0	0	0	0		100.0%

Angular (Corrected) Transformed Summary

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Contr	5	1.521	1.521	1.521	1.521	1.521	1.521	0	0.0%	0.0%
18		5	1.521	1.521	1.521	1.521	1.521	1.521	0	0.0%	0.0%
32		5	1.521	1.521	1.521	1.521	1.521	1.521	0	0.0%	0.0%
56		5	1.4	1.18	1.619	1.521	1.133	1.521	0.07894	12.61%	7.97%
100		5	0.05002	0.05001	0.05003	0.05002	0.05002	0.05002	0	0.0%	96.71%
180		5	0.05002	0.05001	0.05003	0.05002	0.05002	0.05002	0	0.0%	96.71%

Analysis ID:	11-6461-9371	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.8.7
Analyzed:	29 Sep-14 11:34	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Proportion Normal Detail

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1	1	1	1	1
18		1	1	1	1	1
32		1	1	1	1	1
56		0.93	0.82	1	1	1
100		0	0	0	0	0
180		0	0	0	0	0

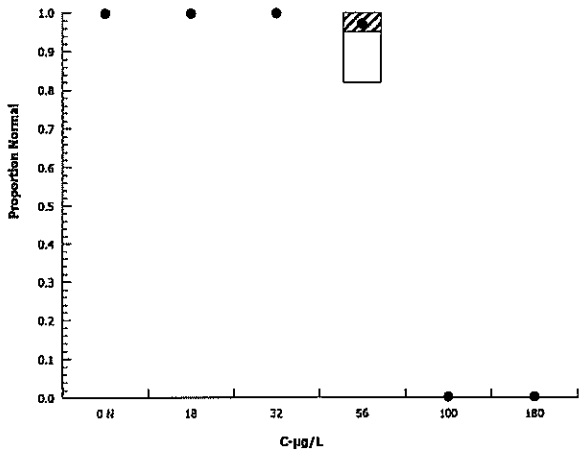
Angular (Corrected) Transformed Detail

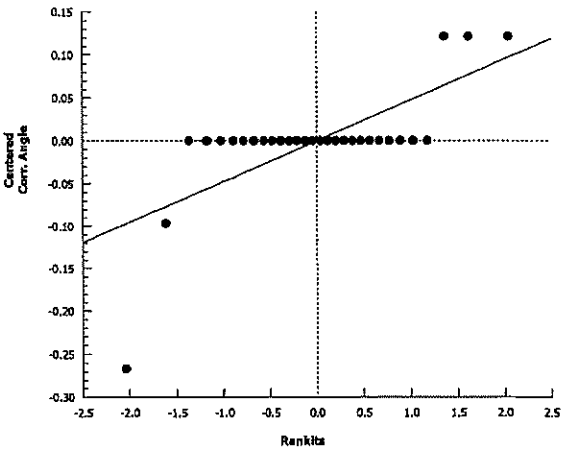
C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.521	1.521	1.521	1.521	1.521
18		1.521	1.521	1.521	1.521	1.521
32		1.521	1.521	1.521	1.521	1.521
56		1.303	1.133	1.521	1.521	1.521
100		0.05002	0.05002	0.05002	0.05002	0.05002
180		0.05002	0.05002	0.05002	0.05002	0.05002

Proportion Normal Binomials

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	100/100	100/100	100/100	100/100	100/100
18		100/100	100/100	100/100	100/100	100/100
32		100/100	100/100	100/100	100/100	100/100
56		93/100	82/100	100/100	100/100	100/100
100		0/100	0/100	0/100	0/100	0/100
180		0/100	0/100	0/100	0/100	0/100

Graphics





CETIS Analytical Report

Report Date: 29 Sep-14 11:35 (p 1 of 2)
Test Code: ABS091114 | 03-8285-2263

Red Abalone Larval Development Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	00-1027-5282	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.8.7
Analyzed:	29 Sep-14 11:34	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Sample ID:	06-4301-8044	**Code:**	ABS091114	**Client:**	Internal Lab
Sample Date:	11 Sep-14 12:30	**Material:**	Zinc	**Project:**	REF TOX
Receive Date:		**Source:**	Reference Toxicant		
Sample Age:	NA	**Station:**	REF TOX		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

Point Estimates

Level	µg/L	95% LCL	95% UCL
EC5	56	35.79	59.3
EC10	58.32	50.42	61.44
EC15	60.63	56.37	63.58
EC20	62.95	58.93	65.73
EC25	65.26	61.5	67.87
EC40	72.21	69.2	74.29
EC50	76.84	74.33	78.58

Proportion Normal Summary

			Calculated Variate(A/B)								
C-µg/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Negative Control	5	1	1	1	0	0	0.0%	0.0%	500	500
18		5	1	1	1	0	0	0.0%	0.0%	500	500
32		5	1	1	1	0	0	0.0%	0.0%	500	500
56		5	0.95	0.82	1	0.03521	0.07874	8.29%	5.0%	475	500
100		5	0	0	0	0	0		100.0%	0	500
180		5	0	0	0	0	0		100.0%	0	500

Proportion Normal Detail

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1	1	1	1	1
18		1	1	1	1	1
32		1	1	1	1	1
56		0.93	0.82	1	1	1
100		0	0	0	0	0
180		0	0	0	0	0

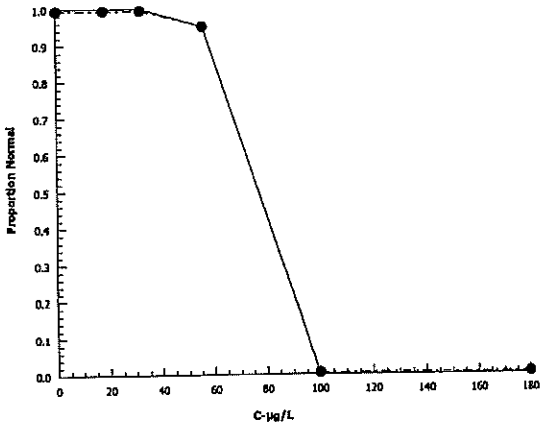
Proportion Normal Binomials

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	100/100	100/100	100/100	100/100	100/100
18		100/100	100/100	100/100	100/100	100/100
32		100/100	100/100	100/100	100/100	100/100
56		93/100	82/100	100/100	100/100	100/100
100		0/100	0/100	0/100	0/100	0/100
180		0/100	0/100	0/100	0/100	0/100

Red Abalone Larval Development Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	00-1027-5282	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.8.7
Analyzed:	29 Sep-14 11:34	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Graphics



CETIS Measurement Report

Test Code: ABS091114 | 03-8285-2263

Red Abalone Larval Development Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Batch ID:	04-4233-3821	**Test Type:**	Development	**Analyst:**	
Start Date:	11 Sep-14 12:30	**Protocol:**	EPA/600/R-95/136 (1995)	**Diluent:**	Laboratory Seawater
Ending Date:	13 Sep-14 12:30	**Species:**	Haliotis rufescens	**Brine:**	Not Applicable
Duration:	48h	**Source:**	Cultured Abalone	**Age:**	

Sample ID:	06-4301-8044	**Code:**	ABS091114	**Client:**	Internal Lab
Sample Date:	11 Sep-14 12:30	**Material:**	Zinc	**Project:**	REF TOX
Receive Date:		**Source:**	Reference Toxicant		
Sample Age:	NA	**Station:**	REF TOX		

Parameter Acceptability Criteria

Parameter	Min	Max	Acceptability Limits	Overlap	Decision
Salinity-ppt	34	34	32 - 36	Yes	Results Within Limits
Temperature-°C	14.9	15.1	14 - 16	Yes	Results Within Limits

Dissolved Oxygen-mg/L

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	6.2	-19.21	31.61	4.2	8.2	2	2.828	45.62%	0
18		2	6.75	-14.22	27.72	5.1	8.4	1.65	2.333	34.57%	0
32		2	6.75	-14.22	27.72	5.1	8.4	1.65	2.333	34.57%	0
56		2	6.75	-14.22	27.72	5.1	8.4	1.65	2.333	34.57%	0
100		2	6.75	-14.22	27.72	5.1	8.4	1.65	2.333	34.57%	0
180		2	6.75	-14.22	27.72	5.1	8.4	1.65	2.333	34.57%	0
Overall		12	6.658			4.2	8.4				0 (0%)

pH-Units

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	7.35	5.444	9.256	7.2	7.5	0.15	0.2121	2.89%	0
18		2	7.45	6.815	8.085	7.4	7.5	0.05	0.07072	0.95%	0
32		2	7.45	6.815	8.085	7.4	7.5	0.05	0.07072	0.95%	0
56		2	7.45	6.815	8.085	7.4	7.5	0.05	0.07072	0.95%	0
100		2	7.45	6.815	8.085	7.4	7.5	0.05	0.07072	0.95%	0
180		2	7.45	6.815	8.085	7.4	7.5	0.05	0.07072	0.95%	0
Overall		12	7.433			7.2	7.5				0 (0%)

Salinity-ppt

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	34	34	34	34	34	0	0	0.0%	0
18		2	34	34	34	34	34	0	0	0.0%	0
32		2	34	34	34	34	34	0	0	0.0%	0
56		2	34	34	34	34	34	0	0	0.0%	0
100		2	34	34	34	34	34	0	0	0.0%	0
180		2	34	34	34	34	34	0	0	0.0%	0
Overall		12	34			34	34				0 (0%)

Temperature-°C

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	15	13.73	16.27	14.9	15.1	0.1	0.1414	0.94%	0
18		2	15	13.73	16.27	14.9	15.1	0.1	0.1414	0.94%	0
32		2	15	13.73	16.27	14.9	15.1	0.1	0.1414	0.94%	0
56		2	15	13.73	16.27	14.9	15.1	0.1	0.1414	0.94%	0
100		2	15	13.73	16.27	14.9	15.1	0.1	0.1414	0.94%	0
180		2	15	13.73	16.27	14.9	15.1	0.1	0.1414	0.94%	0
Overall		12	15			14.9	15.1				0 (0%)

Dissolved Oxygen-mg/L

C-µg/L	Control Type	1	2
0	Negative Contr	8.2	4.2
18		8.4	5.1
32		8.4	5.1
56		8.4	5.1
100		8.4	5.1
180		8.4	5.1

pH-Units

C-µg/L	Control Type	1	2
0	Negative Contr	7.5	7.2
18		7.5	7.4
32		7.5	7.4
56		7.5	7.4
100		7.5	7.4
180		7.5	7.4

Salinity-ppt

C-µg/L	Control Type	1	2
0	Negative Contr	34	34
18		34	34
32		34	34
56		34	34
100		34	34
180		34	34

Temperature-°C

C-µg/L	Control Type	1	2
0	Negative Contr	15.1	14.9
18		15.1	14.9
32		15.1	14.9
56		15.1	14.9
100		15.1	14.9
180		15.1	14.9