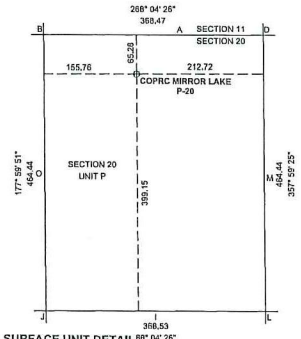
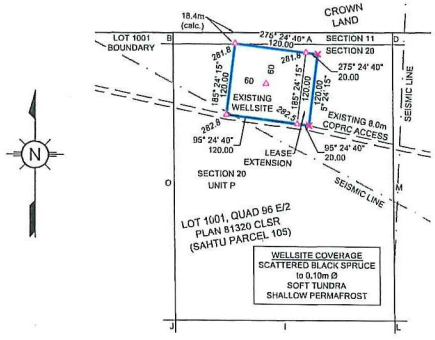
Appendices to Well History Report

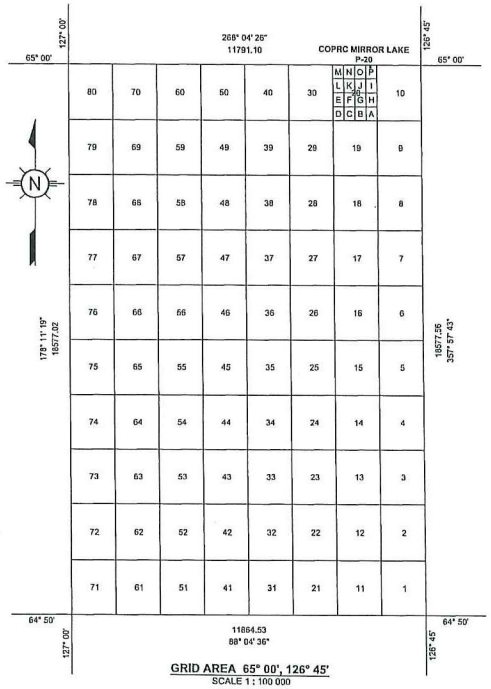
I. Final Survey Plot of COPRC Mirror Lake P-20



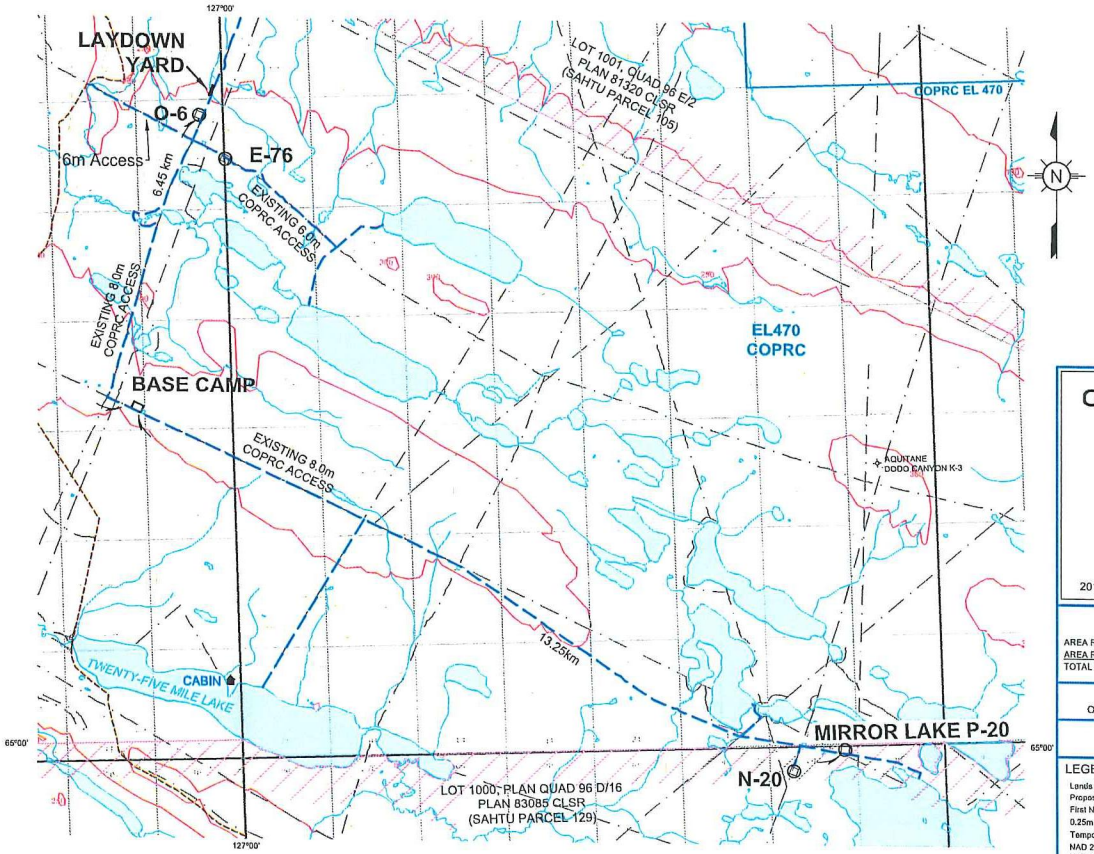
SURFACE UNIT DETAIL
SCALE 1 : 5000



WELLSITE DETAIL
SCALE 1 : 5000



GRID AREA 65° 00', 126° 45'
SCALE 1 : 100 000



ACCESS MAP
SCALE 1 : 50 000

CONOCOPHILLIPS CANADA RESOURCES CORP.

WELLSITE PLAN
OF
COPRC MIRROR LAKE P-20
IN UNIT P, SECTION 20
GRID AREA 65°00', 126°45'
EXPLORATION LICENCE 470

SAHTU SETTLEMENT AREA, TULITA DISTRICT
NORTHWEST TERRITORIES

2012 — RON ROBINSON C.L.S.

AREAS

AREA REQUIRED WITHIN EXISTING WELLSITE	1.44 ha.
AREA REQUIRED FOR WELLSITE EXTENSION	0.24 ha.
TOTAL AREA REQUIRED	1.68 ha.

ELEVATIONS

ON GROUND AT WELL LOCATION = 283.3m

SURVEY DATES

JULY 17-20, 2012

UTM CO-ORDINATES

AT WELL CENTRE (UTM - ZONE 9)

NAD 27	NAD 83
N. 7210027.78	N. 7210224.91
E. 604406.01	E. 604315.48

GEOGRAPHIC CO-ORDINATES

AT WELL CENTRE

NAD 27	NAD 83
LAT. : 64°59'58.0" N.	LAT. : 64°59'58.2" N.
LONG. : 126°47'08.7" W.	LONG. : 126°47'15.3" W.

LEGEND

- Lands to be Dealt with shown thus
- Proposed COPRC Access shown thus
- First Nations Surface Rights
- 0.25m spikes placed are shown thus △
- Temporary traverse points shown thus ×
- NAD 27 UTM coordinates are converted from NAD 83 and are derived from NRCAN Precise Point Positioning (PPP) website.
- Elevations are orthometric and were derived using the HTv2.0 geoid model.
- Bearings are UTM grid (NAD 27) Zone 9 and are referred through C.M. 126° W.
- Distances are in metres and decimals thereof.
- Contour Interval is 10m
- Position of foreign wells is based on NEB records.

OPERATOR: CONOCOPHILLIPS CANADA RESOURCES CORP.

WITNESS

RON ROBINSON
CANADA LANDS SURVEYOR

NOTES:

	NO	YES
-The proposed well is at least 300m from any privately owned land or structures.	☐	☒
-The proposed well is at least 100m from the ordinary high water mark of a permanent water body.	☐	☒
-The proposed well and related areas are 100m from an archaeological/historical/traditional land use site.	☐	☒

Sahtu GeoMatics Ltd.
300-5940 FISHER ROAD S.E.
CALGARY, ALBERTA T2H 0W3
PH (403) 253-6101
FAX (403) 253-1985
Email calgary@sahtusurv.com

REVISION NOTES:

No.	DATE	DESCRIPTION	By
2	2012-08-01	PLAN ISSUED	MB
1	2013-02-20	REVISED WELLSITE DIMENSIONS, MOVED WELLSITE TO 2013-2014 PROJECT	MB

SCALE:	DRAWN/CHECKED:	DATE:	CALC NO.: 36784
AS SHOWN	MB/IC/RR	2013-02-21	ACAD NO.: 36784_P-20

II. Casing and Cementing Report

ConocoPhillips Canada

Casing Summary
Mirror Lake P-20 65-00 126-45

' / UWI	Surface Legal Location	District	Field Name	License No.
./D-020/L094P1699	P-20 65-00 126-45	NEW VENTURES	Mirror Lake	EL 470
Program	**Well Type**	**Well Configuration Type**	**Original KB/RT Elevation (m)**	**KB-Ground Distance (m)**
	Appraisal	HORIZONTAL	289.35	5.20

Conductor, 20.00mKB

Set Depth (mKB)	Set Tension (daN)	String Nominal OD (mm)	String Min Drift (mm)	Centralizers Count	Scratchers Count
20.00		508.0			

Jts	Item Des	OD Nominal (mm)	Nominal ID (mm)	Wt (kg/m)	Grade	Top Thread	Top (mKB)	Btm (mKB)	Section Length (m)	P Burst (kPa)	P Collapse (kPa)
	Casing Joints	508.0	475.7	197.926	K-55		7.10	20.00	12.90		10,342

Surface, 602.00mKB

Set Depth (mKB)	Set Tension (daN)	String Nominal OD (mm)	String Min Drift (mm)	Centralizers Count	Scratchers Count
602.00		244.5		12 x centralizers / 1 x cement basket	

Jts	Item Des	OD Nominal (mm)	Nominal ID (mm)	Wt (kg/m)	Grade	Top Thread	Top (mKB)	Btm (mKB)	Section Length (m)	P Burst (kPa)	P Collapse (kPa)
46	Casing Joints	244.5	226.6	53.574	J-55	LTC	5.16	587.97	582.81		13,927
1	Float Collar	244.5	226.6	53.574	J-55	LTC	587.97	588.33	0.36		13,927
1	Casing Joints	244.5	226.6	53.574	J-55	LTC	588.33	601.61	13.28		13,927
1	Float Shoe	244.5	226.6	53.574	J-55	LTC	601.61	602.00	0.39		

Intermediate, 2,152.00mKB

Set Depth (mKB)	Set Tension (daN)	String Nominal OD (mm)	String Min Drift (mm)	Centralizers Count	Scratchers Count
2,152.00		177.8		35 Volants from 2152m to 1698m, 10 micro seals from 1818m to 1698m,	

Jts	Item Des	OD Nominal (mm)	Nominal ID (mm)	Wt (kg/m)	Grade	Top Thread	Top (mKB)	Btm (mKB)	Section Length (m)	P Burst (kPa)	P Collapse (kPa)
1	Landing Joint	177.8	159.4	38.692	P-110	LTC	3.10	7.13	4.03		
1	Mandrel Hanger	177.8	159.4	38.692	P-110	LTC	7.13	8.15	1.02		
156	Casing Joints	177.8	159.4	38.692	P-110	LTC	8.15	2,136.75	2,128.60		
	Float Collar	177.8	159.4	38.692	P-110	LTC	2,136.75	2,137.18	0.43		42,954
1	Casing Joints	177.8	159.4	38.692	P-110	LTC	2,137.18	2,151.53	14.35		42,954
1	Float Shoe	177.8	159.4	38.692	P-110	LTC	2,151.53	2,152.00	0.47		42,954

Production, 3,148.70mKB

Set Depth (mKB)	Set Tension (daN)	String Nominal OD (mm)	String Min Drift (mm)	Centralizers Count	Scratchers Count
3,148.70		114.3		101 Volant Hydroforms	

Jts	Item Des	OD Nominal (mm)	Nominal ID (mm)	Wt (kg/m)	Grade	Top Thread	Top (mKB)	Btm (mKB)	Section Length (m)	P Burst (kPa)	P Collapse (kPa)
1	Pup Joint	114.3	101.6	17.263	P-110	LTC	0.00	0.45	0.45		52,262
1	Casing Joints	114.3	101.6	17.263	P-110	LTC	0.45	2.90	2.45		52,262
1	Mandrel Hanger	114.3	101.6	17.263	P-110	LTC	2.90	3.14	0.24		52,262
124	Casing Joints	114.3	101.6	17.263	P-110	LTC	3.14	1,727.18	1,724.04		52,262
1	Latch Assembly	114.3	101.6	17.263	P-110	LTC	1,727.18	1,727.49	0.31		52,262
1	Seal Bore Sub	114.3	101.6	17.263	P-110	LTC	1,727.49	1,728.28	0.79		52,262
1	Liner Top Packer	114.3	101.6	17.263	P-110	LTC	1,728.28	1,729.64	1.36		52,262
100	Casing Joints	114.3	101.6	17.263	P-110	LTC	1,729.64	3,133.90	1,404.26		52,262
1	Float Collar	114.3	101.6	17.263	P-110	LTC	3,133.90	3,134.27	0.37		52,262
1	Casing Joints	114.3	101.6	17.263	P-110	LTC	3,134.27	3,148.02	13.75		52,262
1	Float Shoe	114.3	101.6	17.263	P-110	LTC	3,148.02	3,148.70	0.68		52,262

ConocoPhillips Canada

Cement Summary
Mirror Lake P-20 65-00 126-45

Production

UWI	Surface Legal Location	District	Field Name	License No.
/D-020/L094P1699	P-20 65-00 126-45	NEW VENTURES	Mirror Lake	EL 470
Program	**Well Type**	**Well Configuration Type**	**Original KB/RT Elevation (m)**	**KB-Ground Distance (m)**
	Appraisal	HORIZONTAL	289.35	5.20

Original Hole

Wellbore Name	Profile Type	Kick Off Depth (mKB)	Vertical Section Direction (°)
Original Hole			

Section Des	Size (mm)	Act Top (mKB)	Act Btm (mKB)
SURFAC	311.0	18.00	602.00
INTRM1	222.0	602.00	2,152.00
PROD1	156.0	2,152.00	3,152.00

UHWB Split System, FMC on 2/6/2014 11:00

Type	Install Date
UHWB Split System	2/6/2014

Des	Make	Model	WP (kPa)	Service	SN
Cap installed until drilling rig is off location	STREAM FLOW Crown				
Left Csg valve	STREAM FLOW Crown	Gate Valve	69,000		217331-03
Right CSG valve	STREAM FLOW Crown	Gate Valve	69,000		217330-38
Left intermediate casing valve	STREAM FLOW Crown	Gate Valve	34,500		44648-010-507
Right intermediate casing valve	STREAM FLOW Crown	Gate Valve	34,000		44648-010-625
Right wing valve	STREAM FLOW Crown	Gate Valve	69,000		217331-06
Left wing valve	STREAM FLOW Crown	Gate Valve	69,000		217330-36
lower master valve	STREAM FLOW Crown	Gate Valve	69,000		217330-49
upper master valve	STREAM FLOW Crown	Gate Valve	69,000		217331-05
Tubing Head	STREAM FLOW Crown		69,000		228095-01
Well head adaptor	STREAM FLOW Crown		69,000		227369
Tee	STREAM FLOW Crown		69,000		220073-3
Casing Bowl	STREAM FLOW Crown	CC-22	34,500	OIL	CC-CH115x958SOWSV-10-2
Intermediate spool	STREAM FLOW Crown	FBD100	34,500	OIL	FBD100-TH115x115SV-00-2

Conductor, 20.00mKB

Casing Description	Wellbore	Run Date	Set Depth (mKB)	Stick Up (mKB)	Set Tension (daN)
Conductor	Original Hole	1/10/2013	20.00	-7.10	

Centralizers Count

Scratchers Count

Jts	Item Des	OD Nominal (mm)	Nominal ID (mm)	Wt (kg/m)	Grade	Top Conn Sz (mm)	Top Thread	Section Length (m)	Top (mKB)	Btm (mKB)
	Casing Joints	508.0	475.7	197.926	K-55			12.90	7.10	20.00

Surface, 602.00mKB

Casing Description	Wellbore	Run Date	Set Depth (mKB)	Stick Up (mKB)	Set Tension (daN)
Surface	Original Hole	2/5/2014	602.00	-5.16	

Centralizers Count
12 x centralizers / 1 x cement basket

Scratchers Count

Jts	Item Des	OD Nominal (mm)	Nominal ID (mm)	Wt (kg/m)	Grade	Top Conn Sz (mm)	Top Thread	Section Length (m)	Top (mKB)	Btm (mKB)
46	Casing Joints	244.5	226.6	53.574	J-55		LTC	582.81	5.16	587.97
1	Float Collar	244.5	226.6	53.574	J-55		LTC	0.36	587.97	588.33
1	Casing Joints	244.5	226.6	53.574	J-55		LTC	13.28	588.33	601.61
1	Float Shoe	244.5	226.6	53.574	J-55		LTC	0.39	601.61	602.00

Intermediate, 2,152.00mKB

Casing Description	Wellbore	Run Date	Set Depth (mKB)	Stick Up (mKB)	Set Tension (daN)
Intermediate	Original Hole	2/14/2014	2,152.00	-3.10	

Centralizers Count
35 Volants from 2152m to 1698m, 10 micro seals from 1818m to 1698m,

Scratchers Count

Jts	Item Des	OD Nominal (mm)	Nominal ID (mm)	Wt (kg/m)	Grade	Top Conn Sz (mm)	Top Thread	Section Length (m)	Top (mKB)	Btm (mKB)
	Landing Joint	177.8	159.4	38.692	P-110		LTC	4.03	3.10	7.13
	Mandrel Hanger	177.8	159.4	38.692	P-110		LTC	1.02	7.13	8.15
156	Casing Joints	177.8	159.4	38.692	P-110		LTC	2,128.60	8.15	2,136.75
1	Float Collar	177.8	159.4	38.692	P-110		LTC	0.43	2,136.75	2,137.18
1	Casing Joints	177.8	159.4	38.692	P-110		LTC	14.35	2,137.18	2,151.53
1	Float Shoe	177.8	159.4	38.692	P-110		LTC	0.47	2,151.53	2,152.00

ConocoPhillips Canada

Cement Summary
Mirror Lake P-20 65-00 126-45

Production

API / UWI	Surface Legal Location	District	Field Name	License No.
200/D-020/L094P1699	P-20 65-00 126-45	NEW VENTURES	Mirror Lake	EL 470
Program	**Well Type**	**Well Configuration Type**	**Original KB/RT Elevation (m)**	**KB-Ground Distance (m)**
	Appraisal	HORIZONTAL	289.35	5.20

Production, 3,148.70mKB

Casing Description	Wellbore	Run Date	Set Depth (mKB)	Stick Up (mKB)	Set Tension (daN)
Production	Original Hole	2/20/2014	3,148.70	0.00	

Centralizers Count	Scratchers Count
101 Volant Hydroforms	

Jts	Item Des	OD Nominal (mm)	Nominal ID (mm)	Wt (kg/m)	Grade	Top Conn Sz (mm)	Top Thread	Section Length (m)	Top (mKB)	Btm (mKB)
1	Pup Joint	114.3	101.6	17.263	P-110		LTC	0.45	0.00	0.45
1	Casing Joints	114.3	101.6	17.263	P-110		LTC	2.45	0.45	2.90
1	Mandrel Hanger	114.3	101.6	17.263	P-110		LTC	0.24	2.90	3.14
124	Casing Joints	114.3	101.6	17.263	P-110		LTC	1,724.04	3.14	1,727.18
1	Latch Assembly	114.3	101.6	17.263	P-110		LTC	0.31	1,727.18	1,727.49
1	Seal Bore Sub	114.3	101.6	17.263	P-110		LTC	0.79	1,727.49	1,728.28
1	Liner Top Packer	114.3	101.6	17.263	P-110		LTC	1.36	1,728.28	1,729.64
100	Casing Joints	114.3	101.6	17.263	P-110		LTC	1,404.26	1,729.64	3,133.90
1	Float Collar	114.3	101.6	17.263	P-110		LTC	0.37	3,133.90	3,134.27
1	Casing Joints	114.3	101.6	17.263	P-110		LTC	13.75	3,134.27	3,148.02
1	Float Shoe	114.3	101.6	17.263	P-110		LTC	0.68	3,148.02	3,148.70

Production, Casing, 2/21/2014 06:15

Cementing Start Date	Cementing End Date	Wellbore
2/21/2014	2/21/2014	Original Hole

Evaluation Method
Returns to Surface

Cement Evaluation Results
Hold safety meeting with Schlumberger cementers prior to cementing 114.3mm production liner, rig up Schlumberger cementers to cement 114.3mm production liner, pump 8m3 of 1000kg/m3 CW8 pre-flush, stop and pressure test line to 35,000kPA (held OK), bleed off pressure, then pump 5m3 of 1200kg/m3 MUDPUSH II pre-flush spacer and then pump 20 tonnes/14.7m3 (20% excess) of 1900kg/m3 Conventional Class G Tail Cement with 0.6% Fluid Loss + 0.5% Dispersant + 0.2% Anti Foam + 0.2% Retarder + 72L/tonne Gas Control Agent from 3148.70mMD to 1727.49mMD. Drop dart and displace 19.8m3 of fresh water. Bump plug 3,500kpa over final circulating pressure of 19,200kPA at 9:05hrs on February 21st 2014, bleed pressure and check floats (holding OK). pressure up to 28,000kPA and set liner with liner top packer at 1727.49mMD, circulate out pre-flush and 2m3 of excess cement out, displace hole with fresh water, rig out cementers, flowcheck, rig up laydown truck, laydown drill pipe and heavy weight drill pipe, run in the rest of the drill pipe in the derrick, laydown drill pipe, rig up and run USIT log and pressure pass USIT log, rig up power tongs, run 114.3mm tie-back liner, space out, land mandrel seal assembly and tie into top of liner top packer, remove landing joint, pressure test packoff seal assembly, pressure test 114.3mm x 177.8mm annulus to 15,000kPA with Schlumberger cementers.

Comment
Hold safety meeting with Schlumberger cementers prior to cementing 114.3mm production liner, rig up Schlumberger cementers to cement 114.3mm production liner, pump 8m3 of 1000kg/m3 CW8 pre-flush, stop and pressure test line to 35,000kPA (held OK), bleed off pressure, then pump 5m3 of 1200kg/m3 MUDPUSH II pre-flush spacer and then pump 20 tonnes/14.7m3 (20% excess) of 1900kg/m3 Conventional Class G Tail Cement with 0.6% Fluid Loss + 0.5% Dispersant + 0.2% Anti Foam + 0.2% Retarder + 72L/tonne Gas Control Agent from 3148.70mMD to 1727.49mMD. Drop dart and displace 19.8m3 of fresh water. Bump plug 3,500kpa over final circulating pressure of 19,200kPA at 9:05hrs on February 21st 2014, bleed pressure and check floats (holding OK). pressure up to 28,000kPA and set liner with liner top packer at 1727.49mMD, circulate out pre-flush and 2m3 of excess cement out, displace hole with fresh water, rig out cementers, flowcheck, rig up laydown truck, laydown drill pipe and heavy weight drill pipe, run in the rest of the drill pipe in the derrick, laydown drill pipe, rig up and run USIT log and pressure pass USIT log, rig up power tongs, run 114.3mm tie-back liner, space out, land mandrel seal assembly and tie into top of liner top packer, remove landing joint, pressure test packoff seal assembly, pressure test 114.3mm x 177.8mm annulus to 15,000kPA with Schlumberger cementers.

1, 1,727.49-3,148.70mKB

Top Depth (mKB)	Bottom Depth (mKB)	Full Return?	Vol Cement Re...	Top Plug?	Bottom Plug?
1,727.49	3,148.70	Yes	2.00	No	Yes

Initial Pump Rate (m³/min)	Final Pump Rate (m³/min)	Avg Pump Rate (m³/min)	Final Pump Pressure (kPa)	Plug Bump Pressure (kPa)
0.500	0.200	0.500	19,200	22,700

Pipe Reciprocated?	Reciprocation Stroke Length (m)	Reciprocation Rate (spm)	Pipe Rotated?	Pipe RPM (rpm)
No			No	

Tagged Depth (mKB)	Tag Method	Depth Plug Drilled Out To (mKB)	Drill Out Diameter (mm)	Drill Out Date

Production Liner Cement

Fluid Type	Fluid Description	Amount (1000kg)	Class	Volume Pumped (m³)
Production Liner Cement	Conventional 1900 Class G Cement	14.7	Class G	14.70

Estimated Top (mKB)	Estimated Bottom Depth (mKB)	Percent Excess Pumped (%)	Yield (m³/tonne)	Mix H20 Ratio (m³/tonne)
1,727.49	3,148.70	20.0	0.760	0.36

Free Water (%)	Density (kg/m³)	Plastic Viscosity (cP)	Thickening Time (hr)	1st Compressive Strength (kP
	1,900.0			

Cement Fluid Additives

Add	Type	Conc
Anti Foam		0.2
Dispersant		0.5
Fluid Loss		0.6

ConocoPhillips Canada

Cement Summary
Mirror Lake P-20 65-00 126-45

Production

UWI	Surface Legal Location	District	Field Name	License No.
/D-020/L094P1699	P-20 65-00 126-45	NEW VENTURES	Mirror Lake	EL 470
Program	**Well Type**	**Well Configuration Type**	**Original KB/RT Elevation (m)**	**KB-Ground Distance (m)**
	Appraisal	HORIZONTAL	289.35	5.20

Cement Fluid Additives

Add	Type	Conc
Gas Control Agent		
Retarder		0.2

III. Drilling Fluid Summary