Oil & Natural Gas Technology

DOE Award No.: DE-NT0006553

Progress Report
First Half 2012

ConocoPhillips Gas Hydrate Production Test

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Prepared for:
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National Energy Technology Laboratory

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Office of Fossil Energy

Disclaimer

Executive Summary

Accomplishments

- Completed update and presentation of production test plan
- Completed site preparations and establishment of site infrastructure
- Completed pre-test logging and perforating operations
- Completed carbon dioxide injection operations
- Completed flowback and jet pump-assisted drawdown operations
- Completed plugging, permanent abandonment, and icepad closure

Current Status

- Continuing laboratory experimental program
- Field trial data quality control, corrections, and calculations underway
- Field trial data interpretation and analysis underway

Introduction

Work began on the ConocoPhillips Gas Hydrates Production Test (DE-NT0006553) on October 1, 2008. This report is the tenth progress report for the project and summarizes project activities from January 1, 2012 to June 30, 2012. The most significant milestones in this period were completion of pre-test infrastructure, wellbore preparations for production testing, and injection and drawdown testing. Another major milestone was plugging and permanent abandonment of ConocoPhillips - Iġnik Sikumi #1.

Numerical Simulation Study

To design the injection/flowback test it is necessary to understand phase behavior of the reservoir system during each planned stage of the test. An appropriate simulator must be able to correctly capture phase behavior of mixtures of gases (N_2, CO_2, CH_4) and their respective gas-hydrates. Unfortunately there is no commercially available gas-hydrate simulator that can simulate these phase behaviors. In-house development of a full mixed-gas-and-hydrate reservoir simulator was estimated to take more than a year, so a decision was made to instead develop a simplified gas-hydrate model focusing on prediction of the system phase behavior during each stage of the test.

Initial results of in-house isothermal and adiabatic cell-to-cell simulation models were reported in Q4'11 DOE Project Progress Report. Additional simulations with these models has quantified the most desirable injection-gas mixture (77% N_2 + 23% CO_2), the optimal injection slug size (32 pore volumes ≈ 200,000 scf), and indicated the optimal bottomhole pressure (as low as possible without freeze-off) planned for Ignik Sikumi #1 injection and drawdown testing. Results are detailed in Appendix 1: Numerical Simulation.

Task 13 (Phase 3B): Update of Production Test Plan: COMPLETED

An updated Production Test Plan was developed, based on the simulation described above, then discussed with DOE and JOGMEC partners via international teleconference 25 January 2012. Injection of 200,000 scf of 23% CO2 + 77% N2 was proposed, discussed, and approved. Based on previously reported modeling, it was anticipated that injection of 200,000 scf into Sagavanirktok "Upper C" Sand, which has hydrate saturation (S_{Havg}) near 75%, would require approximately two weeks of injection at injection pressure near 1400 psig.

Modeling results summarized in Appendix 2 also strongly influenced drawdown pressures proposed for Iġnik Sikumi #1 drawdown testing. Low gas production rates were expected at bottomhole pressures above the predicted hydrate stability for methane-hydrate, ~650psia. Production test plans were proposed to gradually lower flowing bottomhole pressure during drawdown testing, while carefully maintaining wellbore conditions above 32°F to inhibit ice formation. The goal of this testing was to induce smooth, steady pressure-drop into the reservoir and minimize sharp pressure-transient effects. Discussion of this drawdown proposal resulted in consensus among ConocoPhillips hydrate team members, DOE and JOGMEC project partners, and other key stakeholders.

Task 14 (Phase 3B): Establishment of Site Infrastructure: COMPLETED

Following completion of ice pad construction in Q4'11, construction of a self-contained modular housing-and-office camp on Iġnik Sikumi #1 pad commenced, and camp was approved for occupancy 19 January 2012. Gas Mixing Skid (GMS), nitrogen and carbon dioxide tanks, water/glycol heater were installed, accompanied by diesel-fired electrical generators, water tanks, and flowlines connecting surface equipment to the wellhead. Gas/water/ and sand separation equipment, including Low-rate Gas Measurement Skid and flarestack were also configured before perforating. Well-preservation fluids, consisting of freeze-protected diesel and corrosion-inhibited brine, were displaced and replaced with CO_2/N_2 mixed gas prior to perforating. Details of Task 14 completion can be found in Appendix 2: Well Test Report.

Task 15 (Phase 3B): Pre-test Operations (Logging, Perforating): COMPLETED

Once site infrastructure was established on the surface and the wellbore was loaded with gaseous CO2/N2 mixture, completion mapping was undertaken to determine the location of DTS and electronic cables outside the casing. Once cables were located, a thirty-foot

long perforating assembly was loaded into the wellbore and actuated from 2243ft to 2273ft (MD, sub KB). Perforations were gyroscopically oriented away from DTS and electronic cables, which maintained their integrity after perforation. Actuation of sixty perforating charges established communication from the tubing and casing, through the cemented annulus, into the hydrate-saturated Sagavanirktok "C" Sandstone. Details of Task 15 completion can be found in Appendix 2: Well Test Report.

Task 16 (Phase 3B): CO_2 Injection and Gas Production Monitoring: COMPLETED

Injection of CO_2/N_2 mixture started as soon as perforations were fired (15 Feb 2012), continued during sand-control screen installation (16 Feb 2012), and continued uninterrupted through 28 February 2012. Following injection, wellbore was shut-in for five days while surface equipment was re-configured for flowback. Unassisted flowback commenced just after noon 4 March 2012, and continued for a day and a half, until midnight 6 March 2012. Reverse-flow jet pump was installed and jet pump-assisted drawdown continued from early morning 7 March 2012 until mid-morning 11 April 2012. Two short shut-in periods were accommodated to mitigate surface-equipment issues. Details of Task 16 completion can be found in Appendix 2: Well Test Report.

Cost Status

Expenses incurred during this period were below the Baseline Cost Plan as shown in Exhibit 1.

COST PLAN/STATUS																		
Project Phase ==>	Phase 1, Site Ident.		Phase 2, Field Test Planning							Phase 3A			Phase 3B					
Baseline Reporting Quarter ==>	Q408	Q109	Q209	Q309	Q409	Q110	Q210	Q310	Q410	Q111	Q211	Q311	Q411	Q112	Q212	Q312 budget	Q412 budget	2013 budget
BASELINE COST PLAN																		
Federal Share	-	-	-	-	-	-	-	-	-	-	4,520,635	3,112,490	587,640	4,054,830	3,317,589	-	-	-
Non-Federal Share	288,378	167,366	390,875	333,875	170,699	287,451	285,490	287,451	287,451	473,210	945,515	208,429	528,165	4,689,209	3,536,625	150,000	150,000	170,776
Total Planned	288,378	167,366	390,875	333,875	170,699	287,451	285,490	287,451	287,451	473,210	5,466,150	3,320,919	1,115,805	8,744,040	6,854,214	150,000	150,000	179,860
Cumulative Baseline Cost	288,378	455,744	846,619	1,180,494	1,351,193	1,638,644	1,924,133	2,211,584	2,499,034	2,972,244	8,438,394	11,759,313	12,875,118	21,619,158	28,473,372	28,623,372	28,773,372	28,953,232
ACTUAL INCURRED COSTS																		
Federal Share	-	-	-	-	-	-	-	-	-	549,322	7,083,803	587,640	732,759	3,394,393	2,977,404	-	-	-
Non-Federal Share	121,012	186,099	275,348	354,447	352,324	358,001	227,367	255,579	308,855	473,210	945,515	208,429	1,872,480	4,848,847	2,821,034	-	-	-
Total Incurred Cost	121,012	186,099	275,348	354,447	352,324	358,001	227,367	255,579	308,855	1,022,532	8,029,319	796,069	2,605,239	8,243,240	5,798,438	-	-	-
Cumulative Incurred Cost	121,012	307,111	582,459	936,906	1,289,230	1,647,231	1,874,598	2,130,177	2,439,032	3,461,564	11,490,882	12,286,951	14,892,190	23,135,430	28,933,868	-	-	-
VARIANCE																		
Federal Share	-	-	-	-	-	-	-	-	-	549,322	2,563,168	(2,524,850)	145,119	(660,438)	(340,185)	-	-	-
Non-Federal Share	(167,366)	18,733	(115,527)	20,572	181,625	70,551	(58,123)	(31,872)	21,405	0	0	(0)	1,344,315	159,637	(715,591)	-	-	-
Total Variance	(167,366)	18,733	(115,527)	20,572	181,625	70,551	(58,123)	(31,872)	21,405	549,322	2,563,169	(2,524,850)	1,489,434	(500,800)	(1,055,776)	-	-	-
Cumulative Variance	(167,366)	(148,633)	(264,160)	(243,588)	(61,963)	8,588	(49,535)	(81,407)	(60,002)	489,320	3,052,488	527,638	2,017,072	1,516,272	460,497	-	-	-

Exhibit 1: Cost Plan/Status

Milestone Status

The Milestone Status is shown in Exhibit 2 below.

MILESTONE STATUS REPORT						
#	Task/Subtask Description	Planned Start Date	Planned End Date	Actual Start Date	Actual End Date	Comments
Task 2	Field trial site selected	1-Oct-08	31-Mar-09	1-Oct-08	3-Apr-09	Complete
Task 3	Partner negotiations completed	15-Feb-09	31-Mar-09	17-Mar-09	29-Oct-10	Complete
Task 4	Evaluation of synergies with DOE-BP project	1-Mar-09	31-Mar-09	30-Mar-09	9-Jul-10	Complete
Task 5	Detailed well planning/engineering (test plan)	1-Apr-09	30-Sep-09	10-Mar-09	18-Dec-11	Complete
Task 6	Pre-drill estimation of reservoir behavior	1-Jul-09	31-Dec-09	22-Jun-09	9-Apr-11	Complete
Task 7	Establishment of test site infrastructure	1-Jan-10	31-Dec-10	21-Oct-10	22-Mar-11	Complete
Task 8	Drilling of production test well	1-Apr-10	30-Apr-10	9-Apr-11	16-Apr-11	Complete
Task 9	Pre-test reservoir characterization (logging)	1-May-10	31-Dec-10	17-Apr-11	21-Apr-11	Complete
Task 10	Initial log data review	15-Mar-11	1-May-11	21-Apr-11	25-May-11	Complete
Task 11	Well preparation and completion	15-Mar-11	20-Mar-11	22-Apr-11	28-Apr-11	Complete
Task 12	Temporary well suspension	21-Mar-11	1-Apr-11	29-Apr-11	5-May-11	Complete
Task 13	Update of production test plan	1-Jan-11	31-Dec-11	21-Apr-11	25-Jan-12	Complete
Task 14	Establishment of test site infrastructure	15-Dec-11	15-Jan-12	11-Dec-11	14-Feb-12	Complete
Task 15	Pre-test operations (logging, perforating)	15-Jan-12	20-Jan-12	12-Feb-12	16-Feb-12	Complete
Task 16	CO2 injection and gas production monitoring	21-Jan-12	30-Apr-12	15-Feb-12	10-Apr-12	Complete

Exhibit 2: Milestone Status

Appendix 1: Numerical Simulation Study
Prepared by Suntichai Silpngarmlert, and Kevin Raterman, ConocoPhillips (Houston)

1. Injection Design

The objective of this study was to determine an appropriate injected fluid composition for a methane hydrate exchange field trial employing carbon dioxide as the principle exchange constituent in the injected fluid. The design predicates the use of nitrogen in the injectant as a preflush and/or as a diluent in order to desaturate the near well region of excess free water. The principle purpose being to:

1) avoid excessive permeability reduction in the near well region due to the potential interaction of carbon dioxide with free formation water and the subsequent generation of CO_2-hydrate far in excess of the initial native state hydrate saturation; while
2) maintain reservoir temperature above the freezing point for water, 32^o F, given that prolonged contact of nitrogen with native methane hydrate could initiate hydrate disassociation thereby causing the reservoir interval to cool substantially and possibly freeze; finally,
3) effectively deliver sufficient carbon dioxide in-situ to promote the conversion of methane hydrate to CO_2 hydrate via exchange.

In this study, isothermal and adiabatic cell-to-cell models (described in a previous report) were utilized to study the injection and production responses for the sequenced injection of nitrogen and carbon dioxide as well as constant composition mixtures of said gases.

1.1) Nitrogen Preflush

Given that the use of nitrogen as a preflush could lead to hydrate dissociation and cooling, the adiabatic model was deemed most suitable to study temperature effects due to injection. Because heat transfer between the reservoir and its surroundings is not allowed, the adiabatic model should reflect an extreme prediction for temperature changes associated with hydrate dissociation, formation or exchange. Initial reservoir pressure, temperature and hydrate saturation were fixed at 1000 psia, 41^o F, and 70% respectively. The remaining pore space not occupied by hydrate was assumed to be water filled. For injection, bottomhole conditions were maintained at 1400 psia and 41^o F. Note that fluid temperature at bottomhole was assumed to be equal to initial reservoir temperature based on wellbore simulation model predictions. Injected volumes are expressed as multiples of a single cell volume in the cell-to-cell model. The first cell volume equates to the reservoir annular volume associated with a radial distance of 1 foot from the well bore wall assuming a reservoir height of 30 feet.

Figure 1-1 shows the temperature profiles with radial distance from the well for a four cell volume (CV) N_2-preflush which is followed by an 8 CV CO_2/N_2 mixture. At the end of the N_2 preflush (4 CV, amber curve), the near well (cell one) temperature is near the freezing point of water ($32\ ^oF$). Based upon water displacement simulations it is believed that the volume required to completely dewater the near well region via nitrogen injection is much greater than four cell volumes. Therefore, it is unlikely that

a nitrogen preflush would be effective in displacing free water from this region while avoiding the potential for water to freeze.

Figure 2-1 shows the same case but without the N_2-preflush. In this instance, the model predicted cell one temperature remains within a few degrees of the initial reservoir temperature. Hence, an icing problem is not expected in this injection scenario. It is, therefore, concluded that a N_2 preflush cannot be employed in the field test design; but rather a N_2/CO_2 mixture must be utilized to manage injectivity while promoting hydrate exchange. Mixture design is the subject matter of the following section.

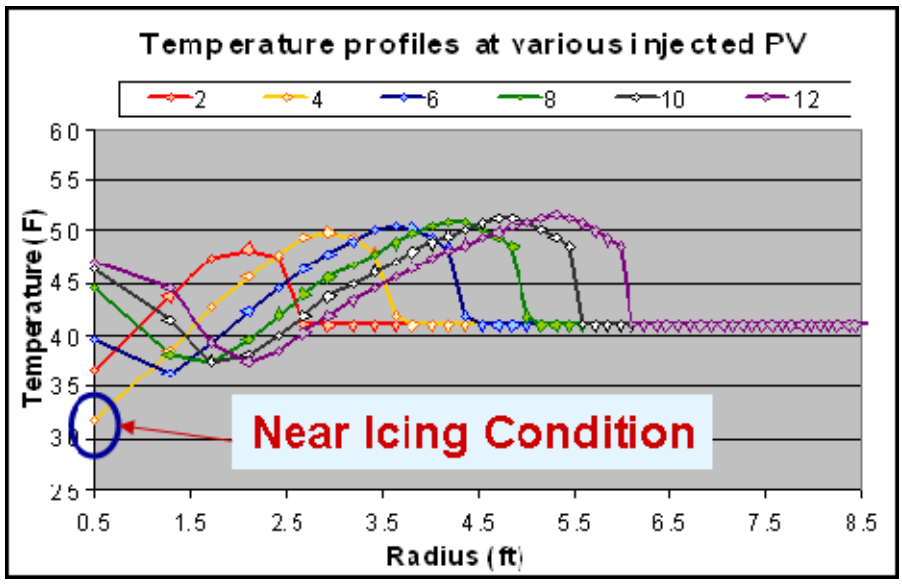

Figure 1-1: Temperature profiles for 4-CV N_2-preflush & 8-CV CO_2/N_2 injection

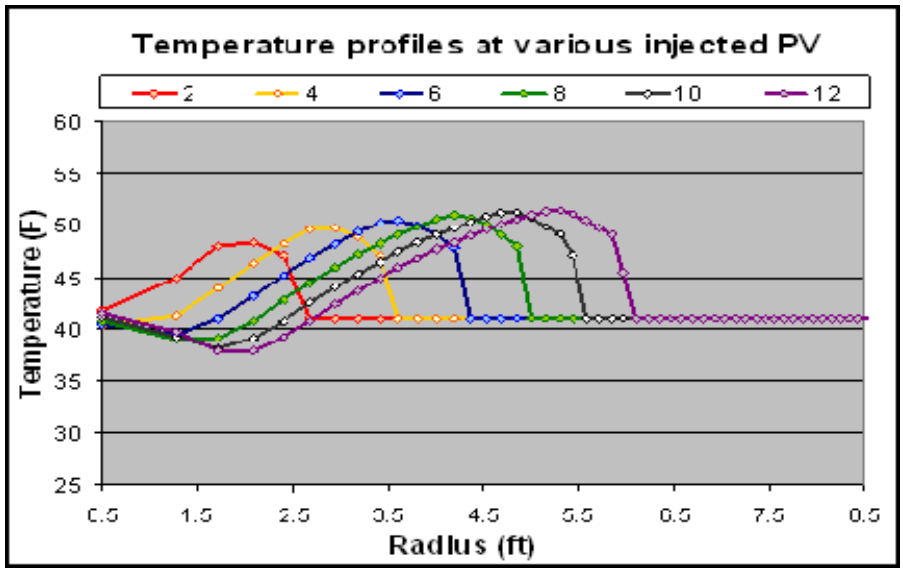

Figure 2-1: Temperature profiles for 12-CV N_2/CO_2 injection (no N_2 preflush)

1.2) CO_2/N_2 mixture design

The injectant mixture design sought a CO_2 / N_2 composition that preserved injectivity and promoted CO_2 exchange with methane hydrate. Integral to preserving injectivity was the avoidance of excessive hydrate saturation build-up in the near well region. The isothermal cell-to-cell model was used for this analysis. The imposition of isothermal conditions thermodynamically favored hydrate formation and represented the worst case scenario for hydrate build-up. CO_2 / N_2 mixtures were varied from approximately 60 mol% CO_2 to 20 mol% CO_2. The upper limit was slightly below the composition at which the injectant will remain in the gaseous state from surface to bottomhole conditions. At higher CO_2 contents the injectant transitions from a gas to a liquid. In that the well was to be operated on tight bottomhole pressure control, it was judged important to avoid phase transitions that may complicate well control.

Figure 3-1 compares hydrate-saturation profiles during 12-CV N_2/CO_2 injection with two different mixture compositions (35 mol% CO_2 vs. 23 mol% CO_2). The initial hydrate saturation in both cases is 50%; initial reservoir pressure, temperature and bottomhole injection conditions are as above.

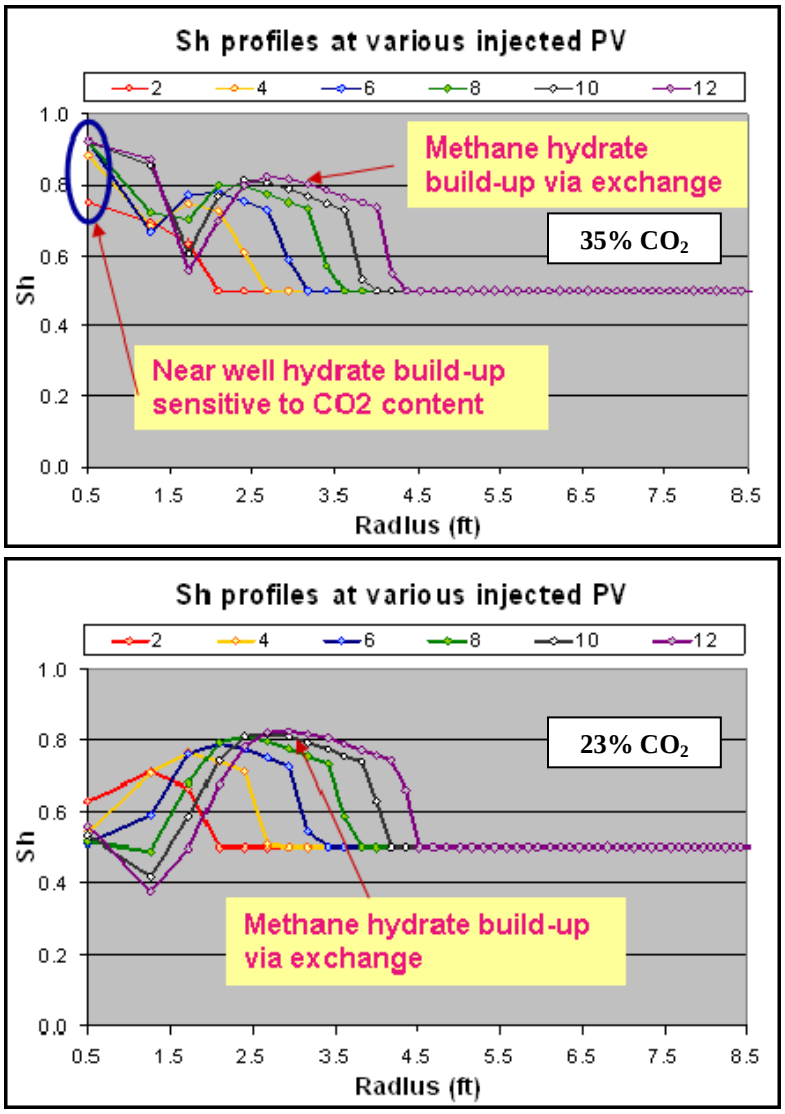

Figure 3-1: Hydrate saturation profiles for two different injected compositions

In the 35 mol% CO_2 case hydrate saturation significantly increases in the near-wellbore region. After 12-CV of mixed gas injection the hydrate saturation increases from 50% to about 93% by volume. In contrast, hydrate saturation build-up in the near well region is significantly less (50 to 63%) for the 23 mol% CO_2 case. Given that the initial effective permeability to gas is already quite low (1 md @ Sh = 50%), injectant mixture compositions below 25 mol% CO_2 are preferred.

Notably, both cases show hydrate build-up deeper into the formation. This hydrate build-up is associated with exchange driven methane enrichment of the gas phase at the displacement front where free water is available to form additional hydrate. With continued injection, the high hydrate saturation front progressively moves outward from the well. The maximum hydrate saturation appears to stabilize at about 80%.

These results were replicated at other injectant compositions over the range of interest.

Model results indicated that within the tested composition range some impairment of injectivity should be anticipated due to in-depth hydrate formation, which was generally insensitive to injectant composition and largely driven by exchange. In the near well region, however, excessive hydrate build-up (Sh > 90%) could be mitigated by adjusting injected fluid composition. A sensitivity study determined that the appropriate injectant composition for the field trial was 23 mol% CO_2 + 77 mol% N_2.

1.3) Injection slug size

A sensitivity study was conducted to determine whether the production response trends (i.e., produced gas composition trends) are affected by injection slug size. Both isothermal and adiabatic cell-to-cell models were used. Initial reservoir conditions were fixed as above. The producing bottomhole pressure was 650 psia. The 23 mol% CO_2 injectant slug size was stepwise varied from one to eight to thirty two cell volumes.

Figure 4-1 illustrates the change of gas compositions in the near-wellbore region (Cell 1) for each injection slug size. Results are for the isothermal cell-to-cell model. The plots show the change of gas composition from the start of injection until the end of production on a cumulative injection and production volume basis. In all cases, the first free-gas appears with a relatively high methane (about 55 mol%) composition indicating the preference for CO_2 to exchange with methane into the hydrate phase. As injection continues, methane composition declines in the near-wellbore region while CO_2 and N_2 compositions in the gas phase increase reflecting the gradual depletion of methane from the hydrate phase. The degree of methane depletion in cell one is a function slug size injected. After approximately 30 CV injected, the hydrate phase in cell one is devoid of methane and the hydrate is in equilibrium with the injected gas composition. Upon production, the declining CH_4 composition trend reverses although some lag is observed in the event that methane is completely swept from the near well region. The production composition profiles for the 1-CV, 8-CV and 32-CV injection cases adequately represent the range of responses expected for the field trial to the extent that isothermal equilibrium applies.

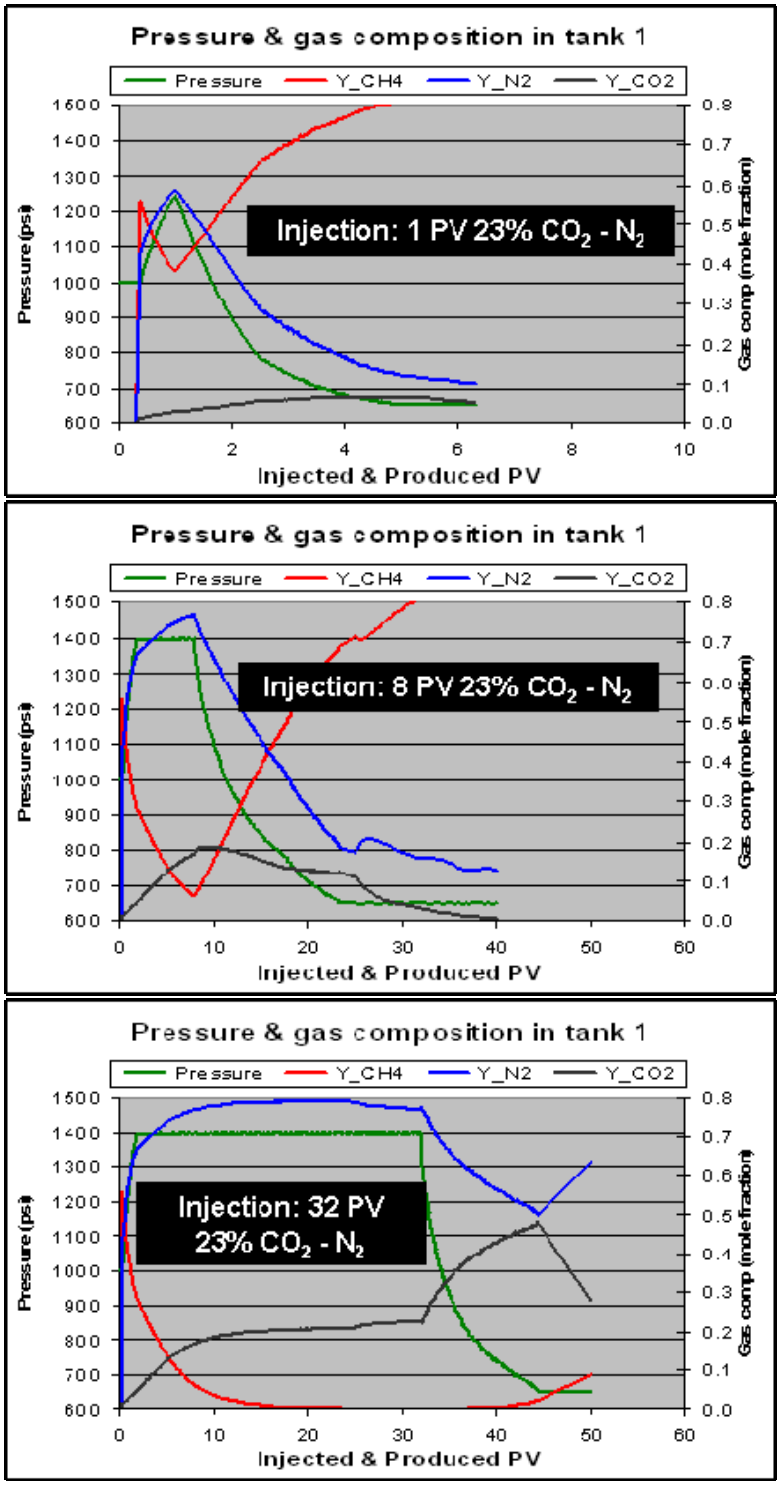

Figure 4-1: Production responses at different injection slug sizes (isothermal)

Figure 5-1 compares the change of gas compositions in model cell one for different injection slug sizes utilizing the adiabatic cell-to-cell model. All model inputs are identical to the above isothermal cases. For the most part the gas composition profiles from the isothermal and adiabatic cell-to-cell models appear similar. Model differences are reflected primarily as differences in magnitude and timing.

In conclusion, production trends may vary as a consequence of the injection slug size. However, these trends appear to be predictable and invariant with respect to the equilibrium model assumptions. Consequently, the design basis for the field trial was predicated on maximizing the injected volume in the allotted time for injection, 17 days. Given average field properties, the estimated injection volume is 200,000 SCF.

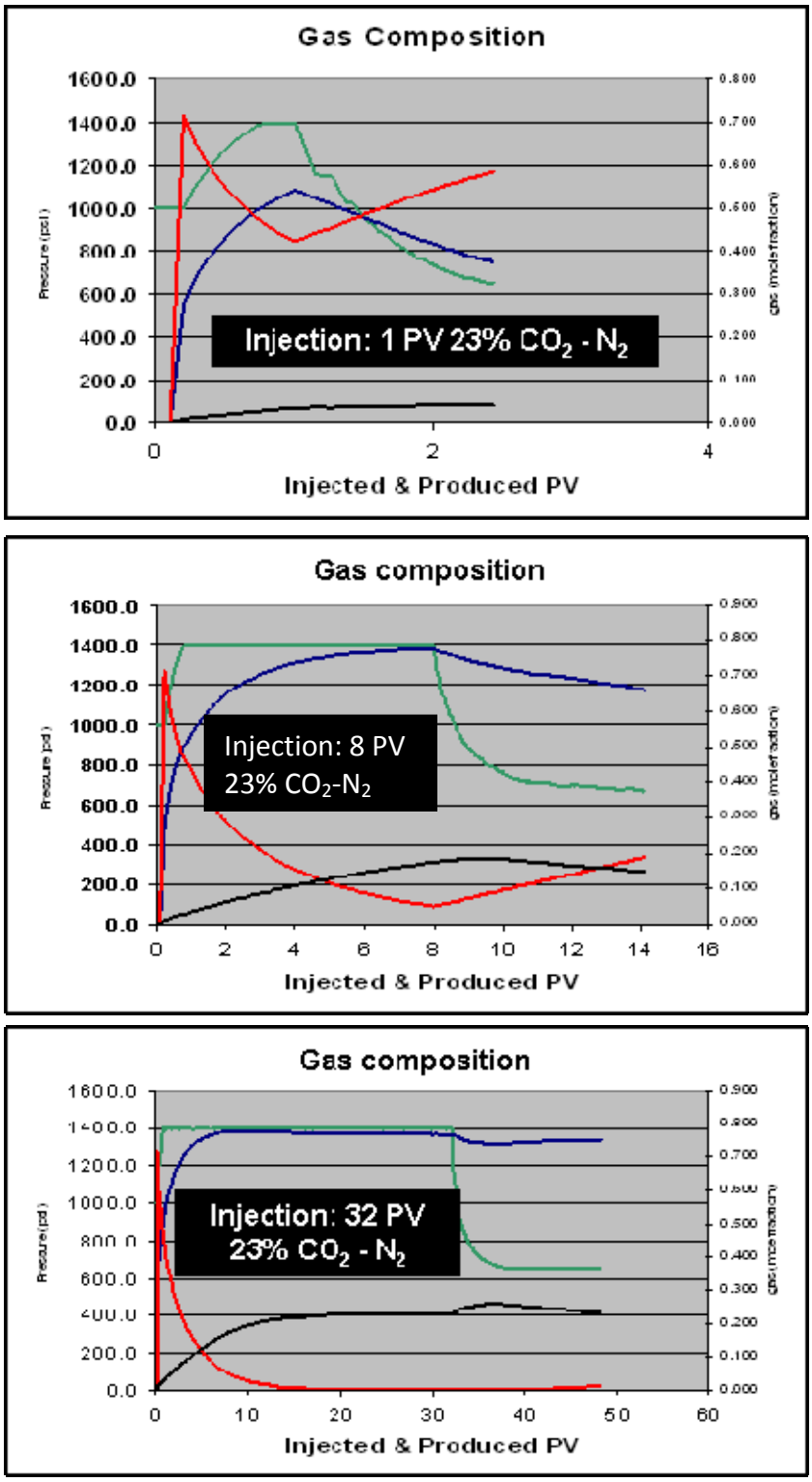

Figure 5-1: Production responses at different injection slug sizes (adiabatic)

2. Production Design

During the flow back phase of the field test, production operations are premised on bottomhole pressure control until and when a facilities rate limit is reached. Additional simulations were conducted to determine process sensitivity to bottomhole pressure. The adiabatic cell-to-cell model was used to examine the production responses at two bottomhole pressures, 800 and 400 psia respectively. These pressures were deliberately chosen in order to bracket the estimated pressure for methane hydrate disassociation at reservoir conditions, approximately 620 psia at 41^{o} F. Initial model conditions were as stipulated above assuming an initial hydrate saturation of 50%. Eight cell volumes of 23 mol% CO2 mixture were injected prior to placing the well on production at the specified pressures.

Figure 6-1 compares the predicted produced gas compositions at 400 and 800 psia producing bottomhole pressures. Within a reasonable approximation, the model predicts similar production composition behavior for both bottomhole pressures. Notably, cell one temperatures do approach 32^{o} F for the 400 psia case. In total these observations imply that operating at pressures above or below the dissociation pressure of pure methane hydrate (620 psia) should not materially change the anticipated production response, although sand face temperature should be closely monitored as lower pressures are achieved. Consequently, the recommended production design for the field trial should be predicated upon achieving stabilized, measurable and maximized production rates for gas within the targeted bottomhole pressure range while maintaining sand face temperatures above freezing. Of course this recommendation is subject to change based on operating constraints explicitly not considered here.

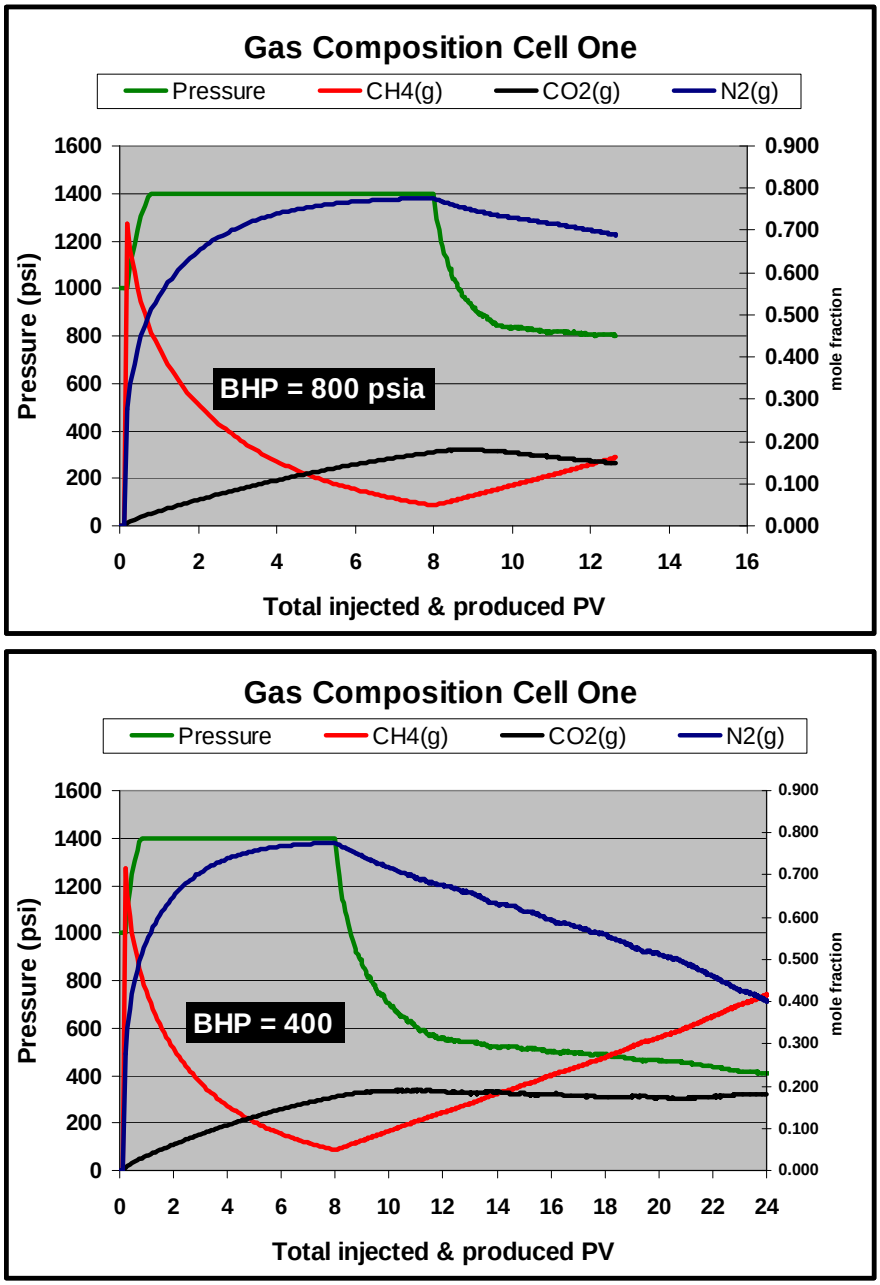

Figure 6-1: Production responses at different bottom-hole pressure (adiabatic)

Appendix 2: Well Test Report
Compiled by David Schoderbek, Bruce Smith, and Keith Hester, ConocoPhillips (Anchorage, Houston, and Bartlesville, respectively)

Introduction

ConocoPhillips has been working with DOE on CO_2/CH_4 hydrate exchange since 2008. After several years of progressively complex laboratory experiments, efforts began in 2009 to execute a large-scale experiment in hydrate-bearing sediments beneath the permafrost in the subsurface of the North Slope. Iġnik Sikumi (Iñupiaq for "fire in the ice") #1 was drilled in April, 2011, for the express purpose of testing hydrate exchange in a series of injection and flowback experiments. Following perforation, injection and production operations were initiated February 15, 2012, following approximately nine months of wellbore suspension. Drawdown testing continued until April 11, 2012, after which wellbore was permanently abandoned**.**

Summary

Surface operations at the Iġnik Sikumi #1 wellsite re-commenced in mid-December, 2011, with surveying and staking, followed by icepad re-building. Camp facilities were constructed on-site to house approximately twenty key workers for the duration of field operations and office space was also built-in to the camp facilities. Camp facilities included self-contained fresh-water, gray-water, and black-water systems as well as diesel-powered electricity generation. Standalone diesel-powered generators to provide wellhead area with electrical power and equipment for surface handling of injectants

(nitrogen, carbon dioxide, tracer gases, heated glycol, and jet pump power fluid) was rigged-up then and connected to the wellhead, including tanks for liquid nitrogen and carbon dioxide, gas-mixing skid, tanks for liquid (glycol and produced water), diesel-fired glycol heater, and low-pressure hoses and high-pressure piping.

Coiled tubing unit was temporarily deployed to the well to displace fluids left in the casing and tubing since May 2011 suspension: corrosion-inhibited brine below the permafrost and freeze-protected diesel in the shallower wellbore. Fluids in upper annulus were replaced with heated glycol, which was circulated via the twin ¾" flatpack strings, and re-heated at the surface to prevent freezing and inhibit hydrate formation in the wellbore. Prior to perforation, the gas-mixing skid was fully operational and a gaseous mixture of 23% CO_2 and 77% N_2 was injected into the wellbore via coiled tubing. The gas-mixing skid managed the heating and vaporization of liquid CO_2 and N_2 into gases as well as their pressurization to injection pressure near 1500psig.

When the completion was installed in April, 2011, two cables were clamped to the outside the casing and cemented in-place. One cable provided electronic connection for three downhole pressure/temperature gauges; the other housed the optical fibers for measurement of distributed temperature sensors (DTS) and distributed acoustic sensors (DAS). Opposite the proposed perforated interval, custom "blast protector" clamps were installed to outside the casing. Extra steel was added to the cable channel to facilitate pre-perforation electromagnetic mapping. Before perforating, extensive cased-hole electromagnetic mapping was undertaken to accurately identify the location of these cables. Oriented perforating guns were subsequently deployed, expressly oriented away from cables. Oriented perforating was successful, with both cables maintaining integrity to the end of operations in April, 2012.

Perforation was accomplished 15 February 2012. Guns were fired in a wellbore filled with CO_2/N_2 mixture in an overbalanced state, so injection phase of field trial began immediately. Injection of mixed CO_2/N_2 proceeded for thirteen days, and resulted in injection of approximately 2609kg of CO_2 and 5479kg of N_2.

The gas-mixing skid housed three other critical systems and controls for all wellhead injection and flowback systems. Accurate compositional mixing was ensured by continuous analysis via gas chromatograph. The tracer gases SF_6 (sulfur hexafluoride) and R114 (the refrigerant dichlorotetrafluoroethane, $C_2Cl_2F_4$) were mixed into the injected gas in the gas-mixing skid. Tracers were injected in small but constant concentrations to assist with quantitative analysis of subsequent flowback results. Target concentrations of SF_6 and R114 were 1ppm and 100ppm, respectively, based on their detection ranges in the gas chromatograph. Circulation of glycol from surface heater, down the annulus, and up the flatpack was accomplished by pumps located in the gas-mixing skid.

Objectives

There were two primary objectives of winter 2012 Operations at CPAI - Iġnik Sikumi #1 wellsite. The first objective was to inject carbon dioxide into a hydrate bearing sandstone

and flow back the products of CO_2/CH_4 exchange, validating laboratory-based exchange reactions. The second objective was to establish drawdown below hydrate stability conditions in a more extensive depressurization experiment than had been previously executed in a field setting.

Results

Both objectives were accomplished. Approximately 57 thousand standard cubic feet (mscf) of carbon dioxide were injected over thirteen days. Hall Plot showing daily injection performance is shown in Figure 1. Temperatures and pressures during injection and subsequent falloff (while surface systems were re-configured for flowback) are shown in Figure 2. Following injection and surface equipment re-configuration, flowback commenced. During the second day of unassisted flowback, Iġnik Sikumi #1 was shut-in for installation of artificial-lift equipment. Flow of formation fluids into the wellbore had nearly ceased by this time, logged-off by a column of produced water filling the wellbore sufficiently high that reservoir pressure was nearly balanced. Surface equipment was re-configured for reverse jet pump-assisted drawdown, and jet pump was installed. Approximately 998 mscf of gas was measured and analyzed via gas chromatograph in the Gas Mixing Skid (GMS), consisting of ~22 mscf CO_2, ~155 mscf N_2, and 821 mscf CH_4. Production testing operations continued until April 11, 2012 and can be divided into five phases. Injection operations are summarized in Figures 1 and 2. Flowback and drawdown operations are summarized in Figures 3 and 4.

Injection Testing

Since perforating was initiated while casing was pressured-up above reservoir pressure with CO_2/N_2 mixture, injection commenced 0815hrs 15 February 2012, as soon as perforating guns were fired. Wellbore remained pressured-up with CO_2/N_2 mixture while sandscreen was run, and active injection continued uninterrupted through 0745hrs 28 February 2012. Approximately 210 mscf of mixed gas was injected with a targeted composition of 23% CO_2 and 77% N_2.

Production Testing Phase 1: Unassisted flowback

Unassisted flowback, utilizing reservoir pressure to lift produced fluids to the surface, lasted thirty-four hours, from 1354 hrs 4 March 2012 to 0000hrs 6 March 2012. Reservoir pressure at the beginning of unassisted flowback was 1177psg, and reached 867psia before well was shut-in for installation of an Oilmaster “5C” jet pump.

Production Testing Phase 2: Jet pumping above CH_4-hydrate stability pressure
Reverse-flow jet pumping above hydrate stability pressure, with heated water pumped down the 7⅝" x 4½" annulus as power fluid, lasted seven days, from 0313hrs 7 March 2012 to 2330hrs 13 March 2012. This production phase continued until sand-eroded dump valve in separator required well shut-in for repair. Reservoir pressure during this phase was drawdown from 941psia to 604psia.

Production Testing Phase 3: Jet pumping below CH_4-hydrate stability pressure
Following separator repair, reverse-flow jet pumping was reinitiated, targeting smooth lowering of reservoir pressure below methane-hydrate stability pressure. This production phase started 1852hrs 15 March 2012 and continued for two and a half days, until 1040hrs 18 March 2012, when ice formation in the gas flare line required well shut-in for repair. Reservoir pressure at the beginning of this phase was 724psia and declined smoothly to 535 psia. Well was shut-in for five days, during which time ice blockage was cleared and OilMaster "5C" jet pump was replaced with a "6C" pump.

Production Testing Phase 4: Jet pumping below CH_4-hydrate stability pressure
Final production phase of reverse-flow jet pumping, targeting continued gradual lowering of reservoir pressure, lasted 19 days, from 0621hrs 23 March 2012 to 0854hrs 11 April 2012. Reservoir pressure started Phase 4 at 648psia and declined, smoothly in a series of steps, as low as 266psia in the final phase of production testing.

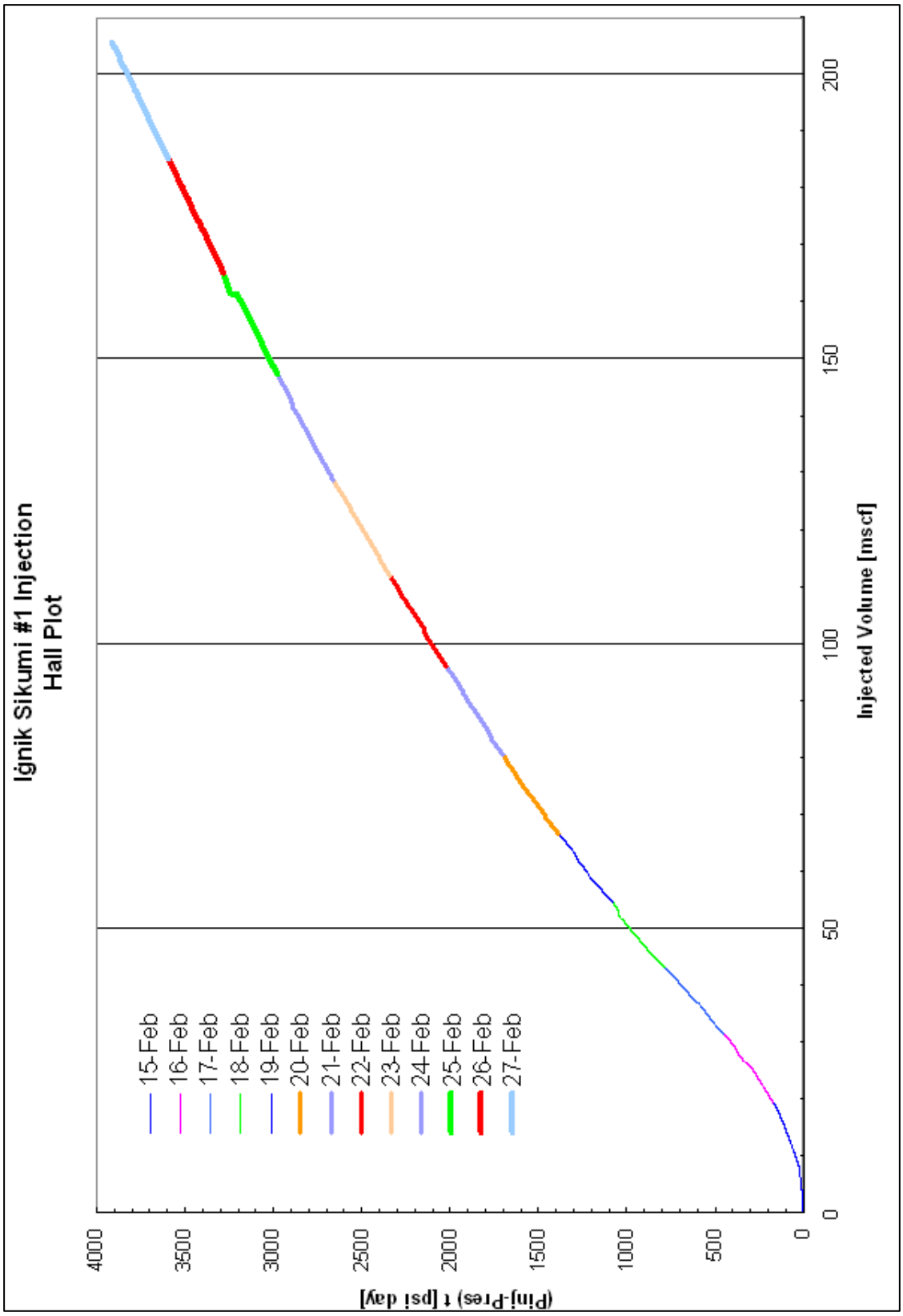

Figure 1: Iġnik Sikumi #1 Injection: Hall Plot (raw, uncorrected data)

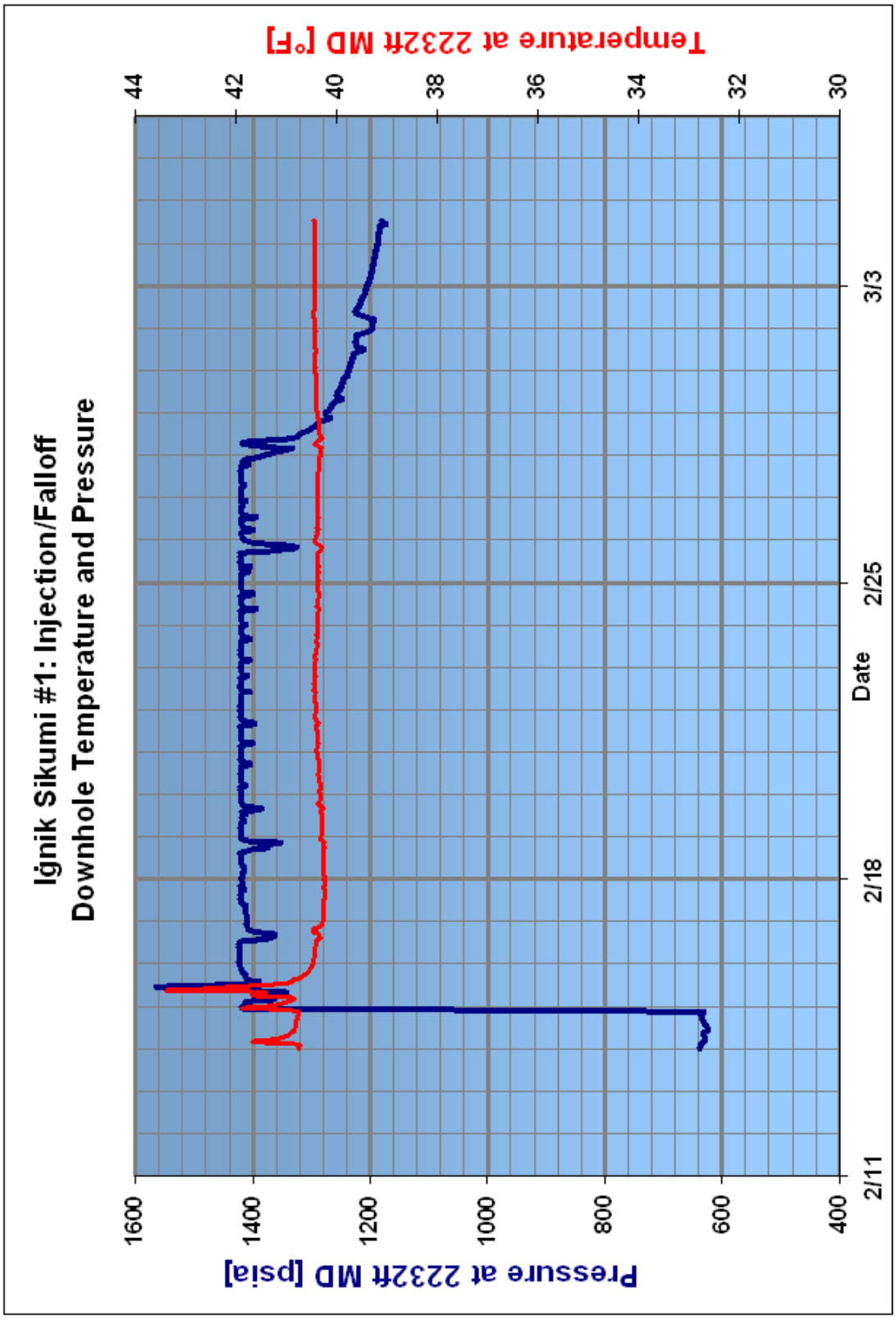

Figure 2: Pressure & Temperature: Iğnik Sikumi #1 Injection and Falloff

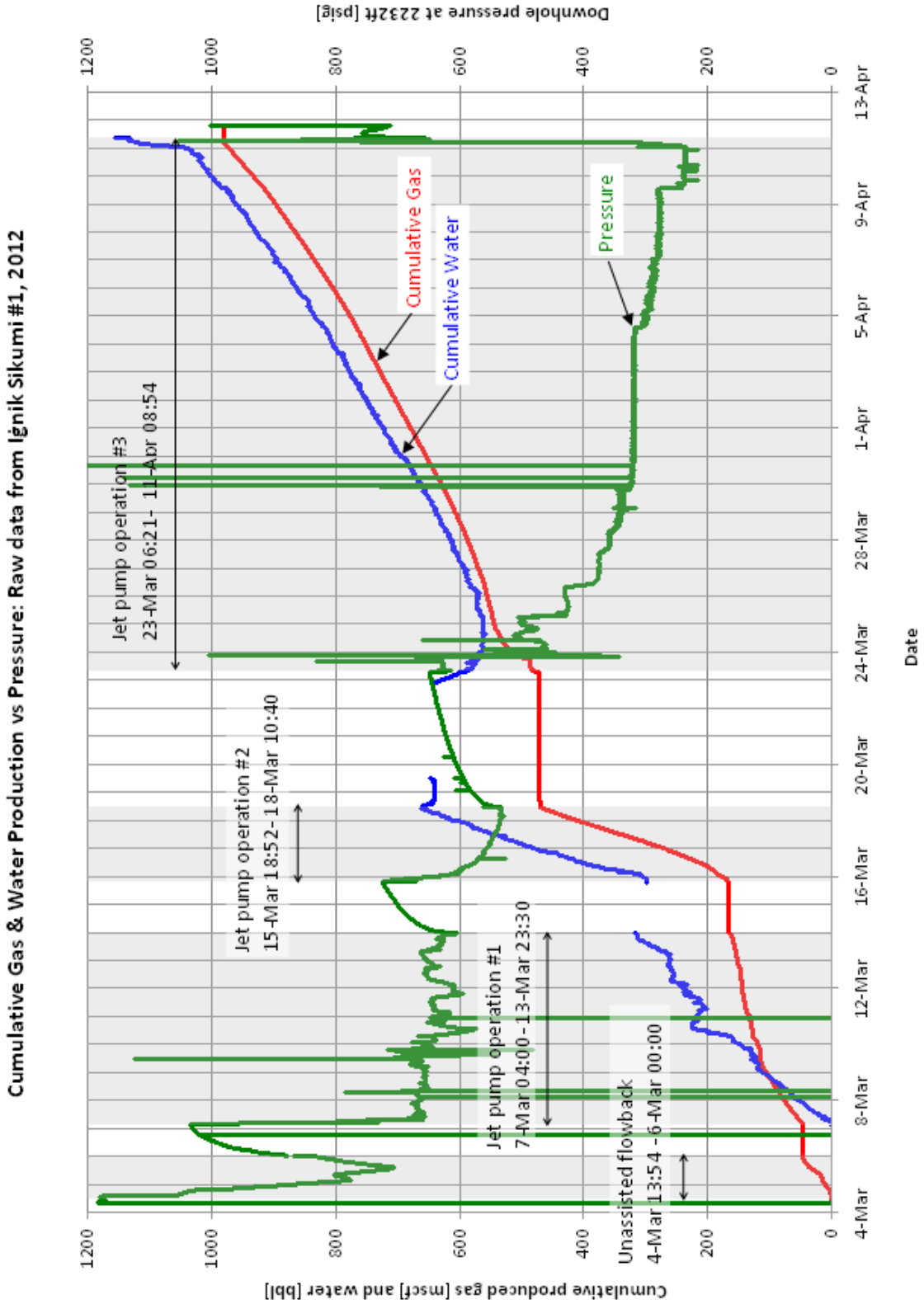

Figure 3: Iğnik Sikumi #1 Flowback/Drawdown (raw, uncorrected data)

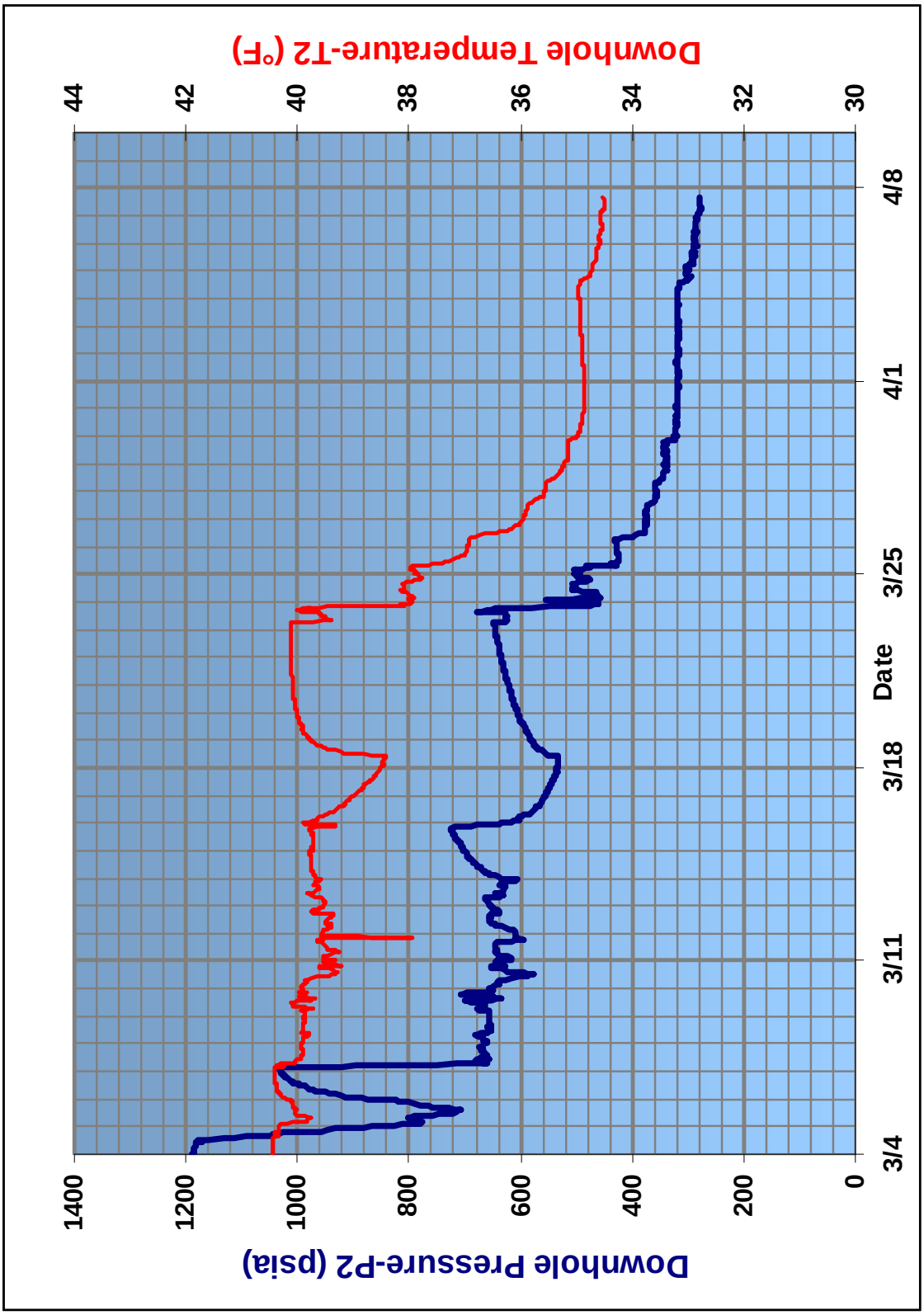

Figure 4: Pressure & Temperature: Iġnik Sikumi #1 Flowback and Drawdown

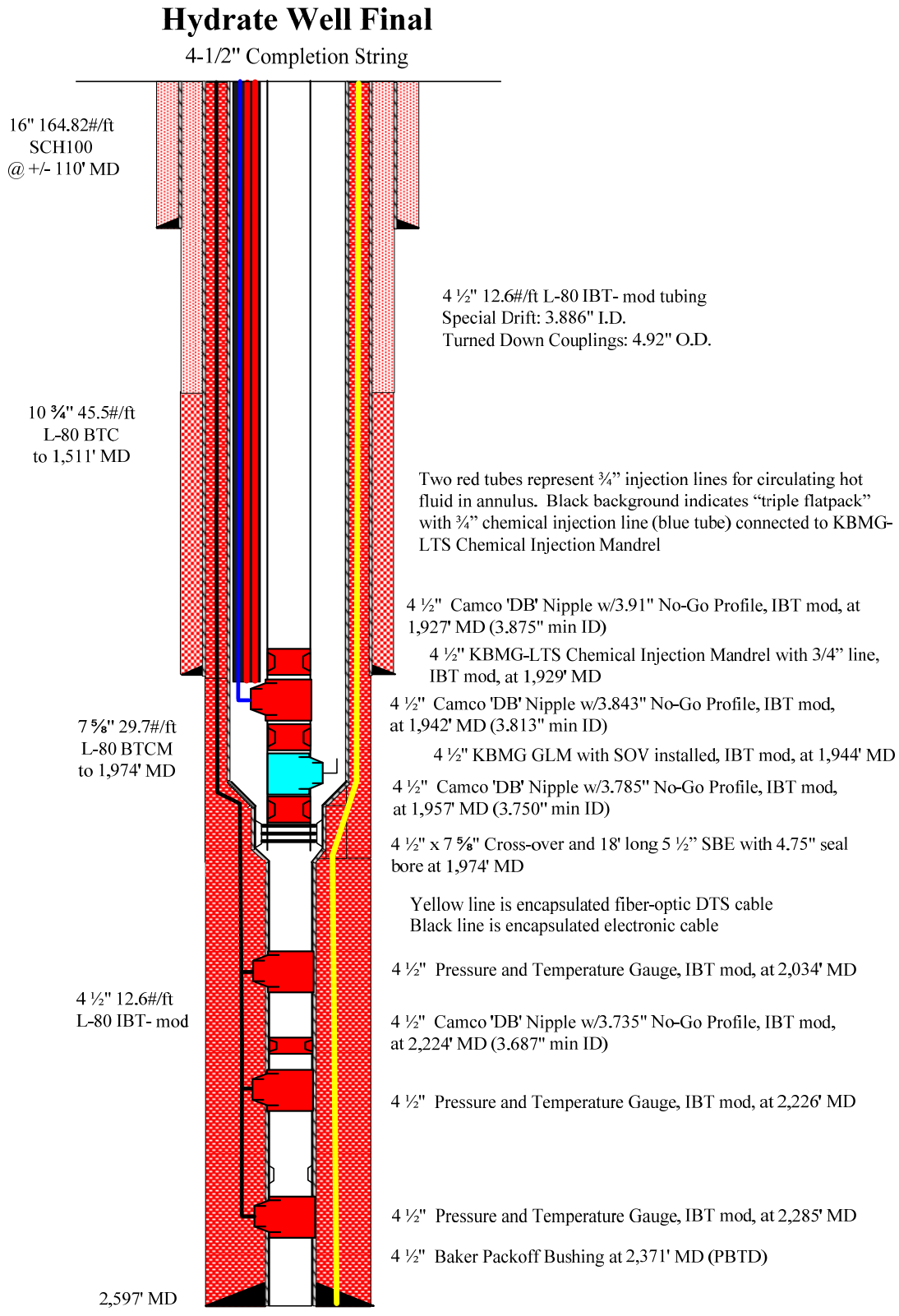

Figure 5: Iġnik Sikumi #1 Wellbore Schematic: Small scale

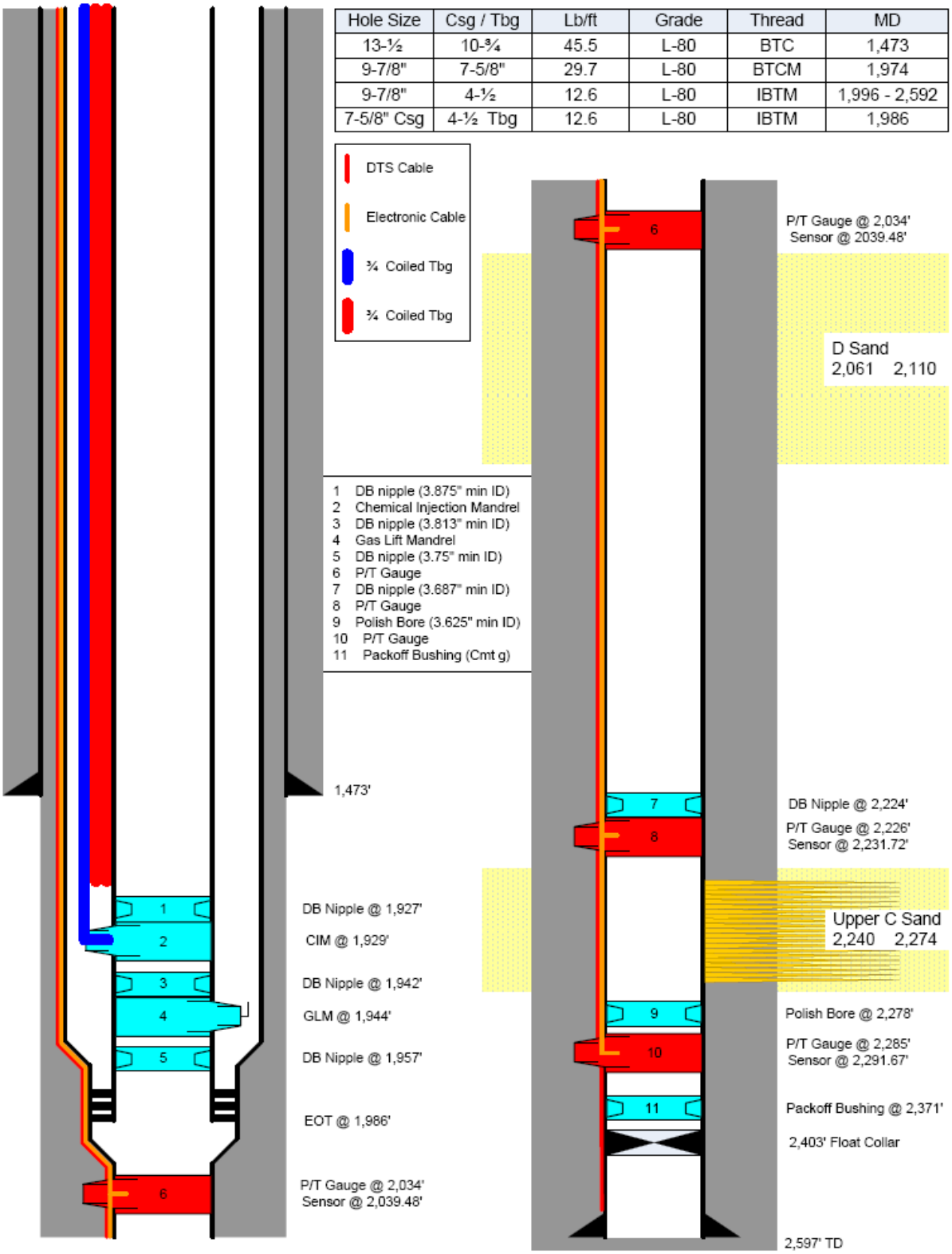

Figure 6: Wellbore Schematic: Large scale

Well Information

Wellbore Details

Sand Screen

Delta Elite 200 micron screens for downhole sand control were built and shipped to Unique Machine in Anchorage, where an assembly including seals and a DB-6 lock was built for space-out across the Sagavanirktok "Upper C" sand. Screens were configured for running and setting inside the 4½"monobore. The assembly and contingency screens were transported to the North Slope and run February 16, 2012.

Table 1 Sand Screen Assembly Detail

OAL	Top Depth	Length	Description	Item	Est. Lbs
1.17	2,224.46	1.17	DB-6 Lock, 3.687" min ID DB Nipple	1	20
1.98	2,225.63	0.81	Upper Cross-Over	2	10
12.06	2,226.44	10.08	Upper Space-out pup	3	70
14.31	2,236.52	2.25	2-7/8" D Nipple (2.188" ID) + X/over	4	10
52.64	2,238.77	38.33	Screen sections (coupled length)	5	391
55.24	2,277.10	2.60	Lower X-over & space-out pup	6	20
56.66	2,279.70	1.42	Baker Seal assembly	7	20
		56.66			541

Heater/Chemical Injection String

FlatPak Tube Specifications, 3 each ¾" Tubes:

- 2 each, Glycol / Water Heat Circulation Tubes (open-ended at bottom ~1,927' MD)
- 1 each, Chemical Injection Tube connected to Chemical Injection Mandrel

OD (inches)	ID (inches)	Drift (inches)	Wt #/ ft	Grade	Thread Connection	Burst (psi)	Collapse (psi)	Tensile Body (1000 lbs)	Tensile Conn. (1000 lbs)
¾"	.576	NA	.618	HS-70	Coiled Tubing	15,000	14,356	12.7	NA

Chemical Injection Valve

A chemical injection valve with 1,500 psi set pressure, for placement in the chemical injection mandrel, was ordered and transported to the North Slope. The Chemical Injection Tube was not used during 2012 Operations, as it was in communication with the 7⅝" x 4½" annulus. It is suspected that the tube failed as a consequence of sub-freezing temperatures in the wellbore and incomplete removal of water from the tube prior to

temporary suspension. Below freezing temperatures (for water) existed in the wellbore between April 2011 and February 2012.

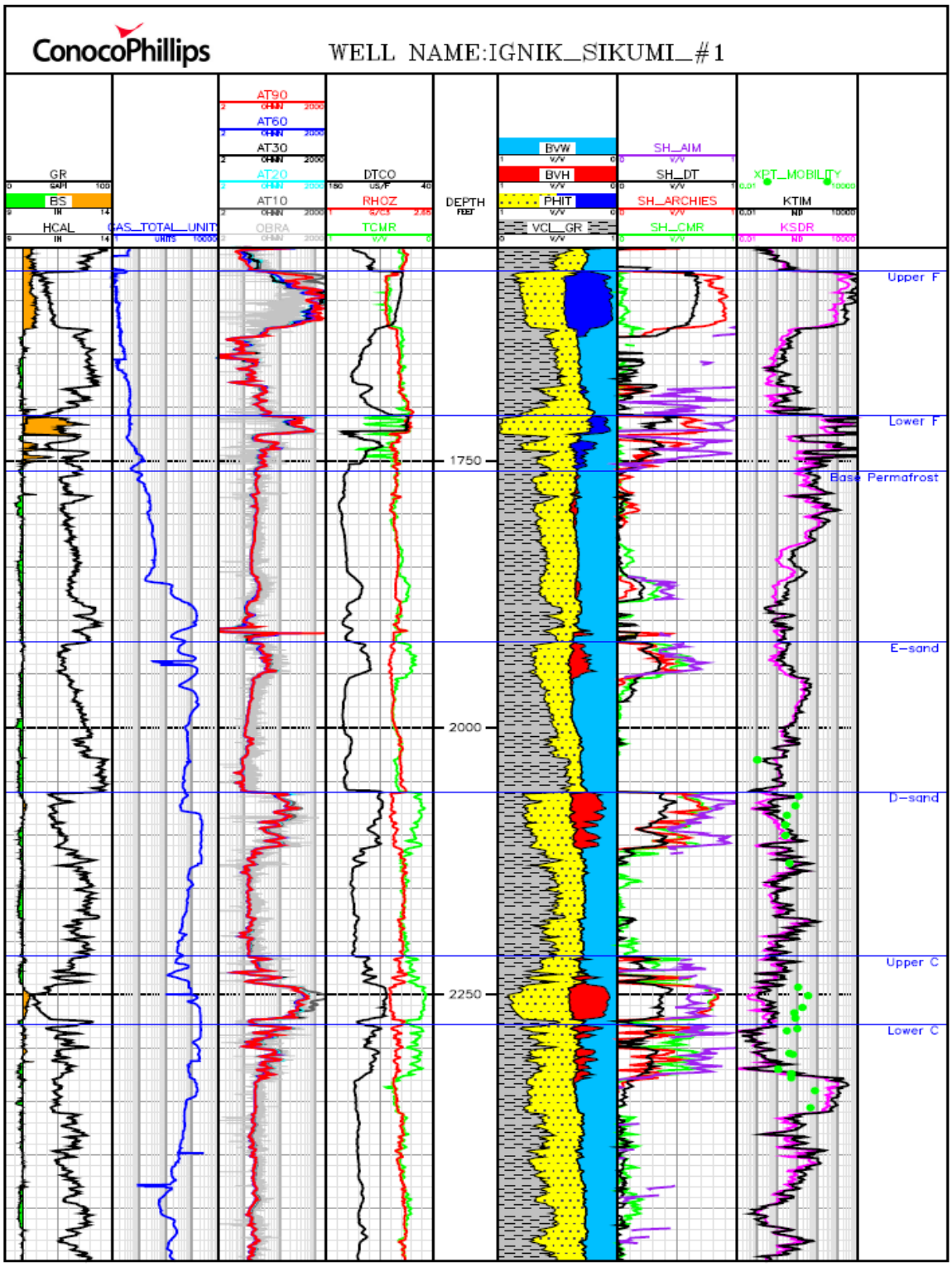

Figure 7: Iġnik Sikumi #1 Hydrate/Water Saturation Log: Small scale

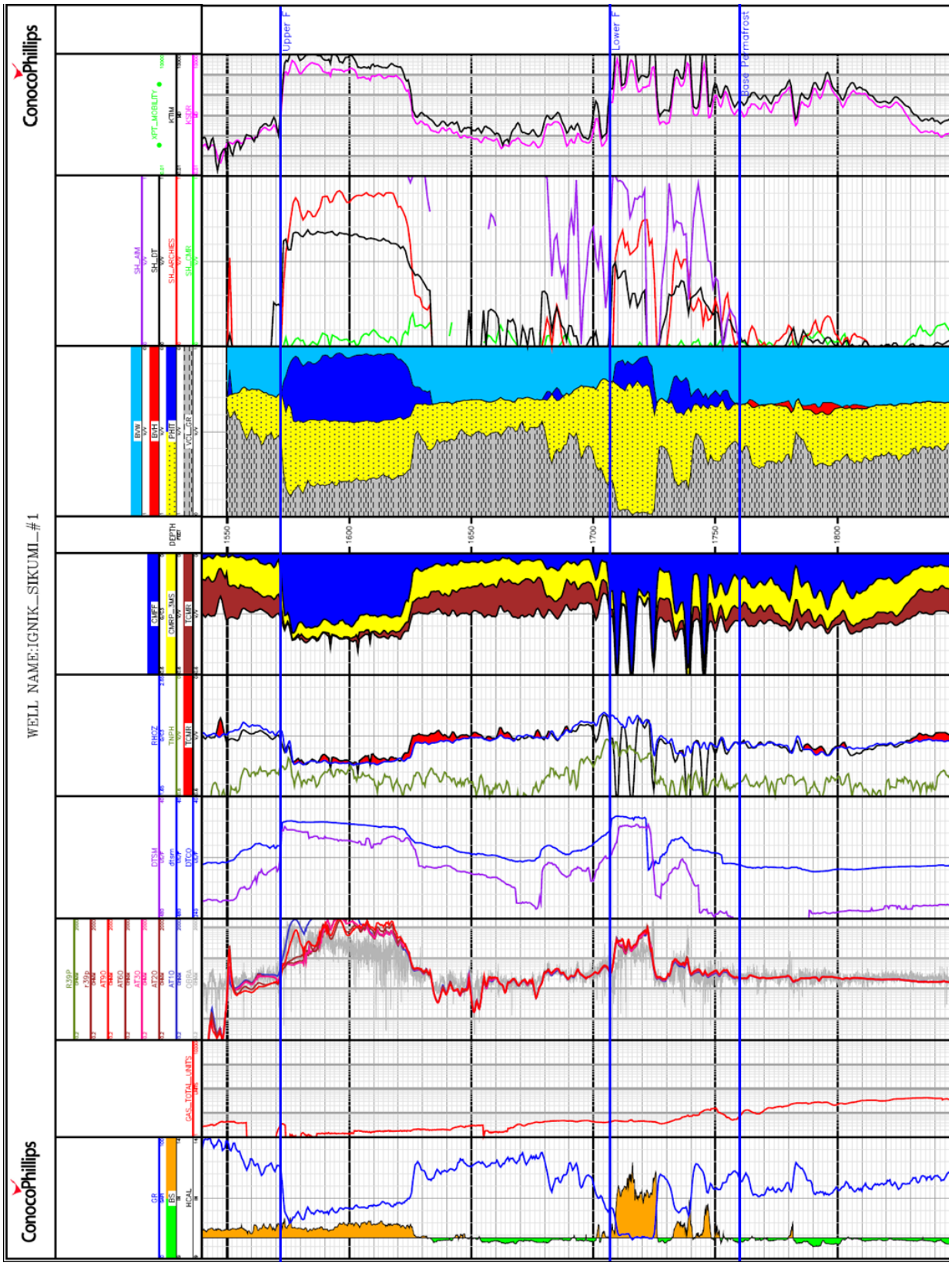

Figure 8: Iġnik Sikumi #1 Log Montage: Ice-bearing Sagavanirktok F Sandstones

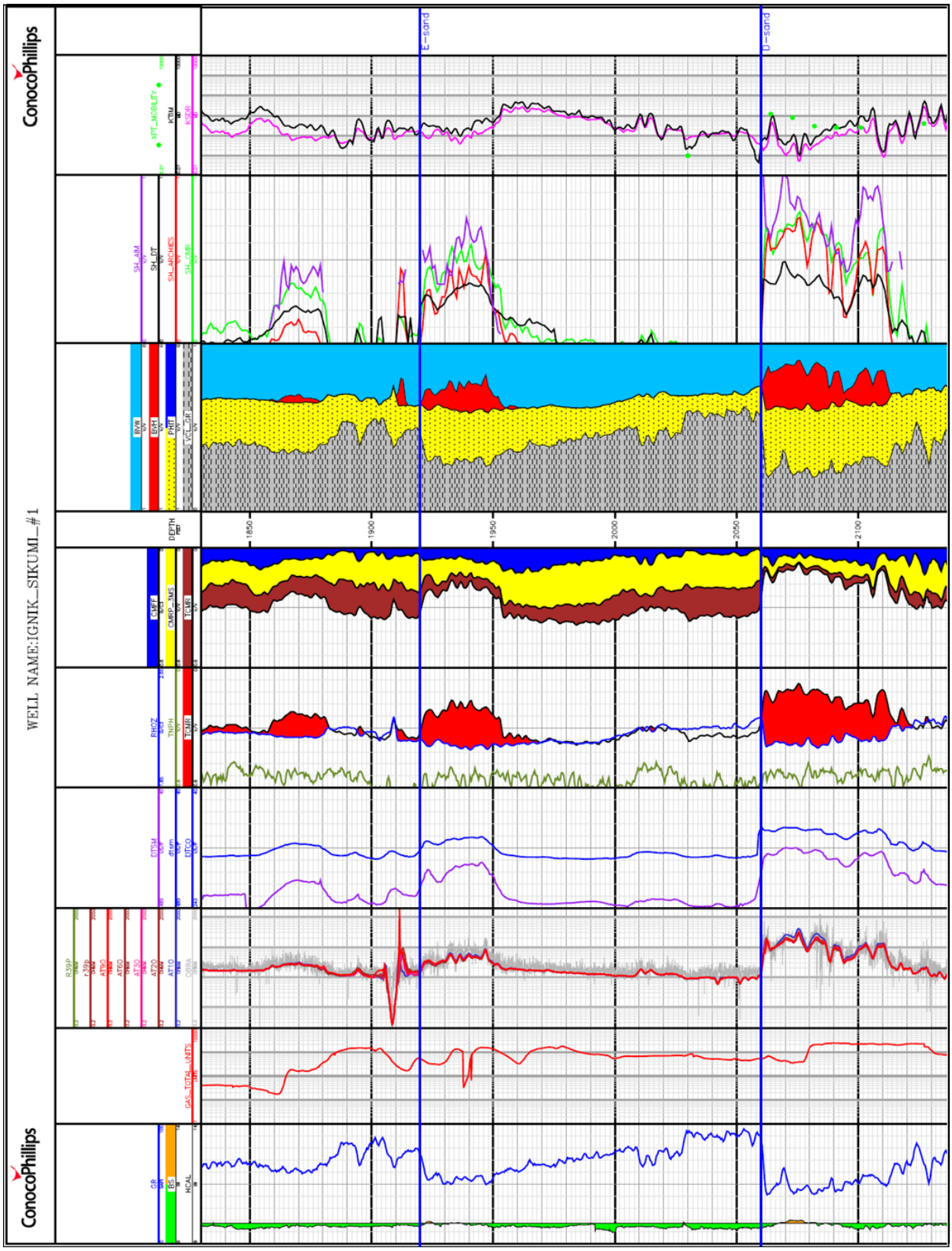

Figure 9: Iġnik Sikumi #1 Montage: Hydrate-bearing Sagavanirktok E & D Sandstones

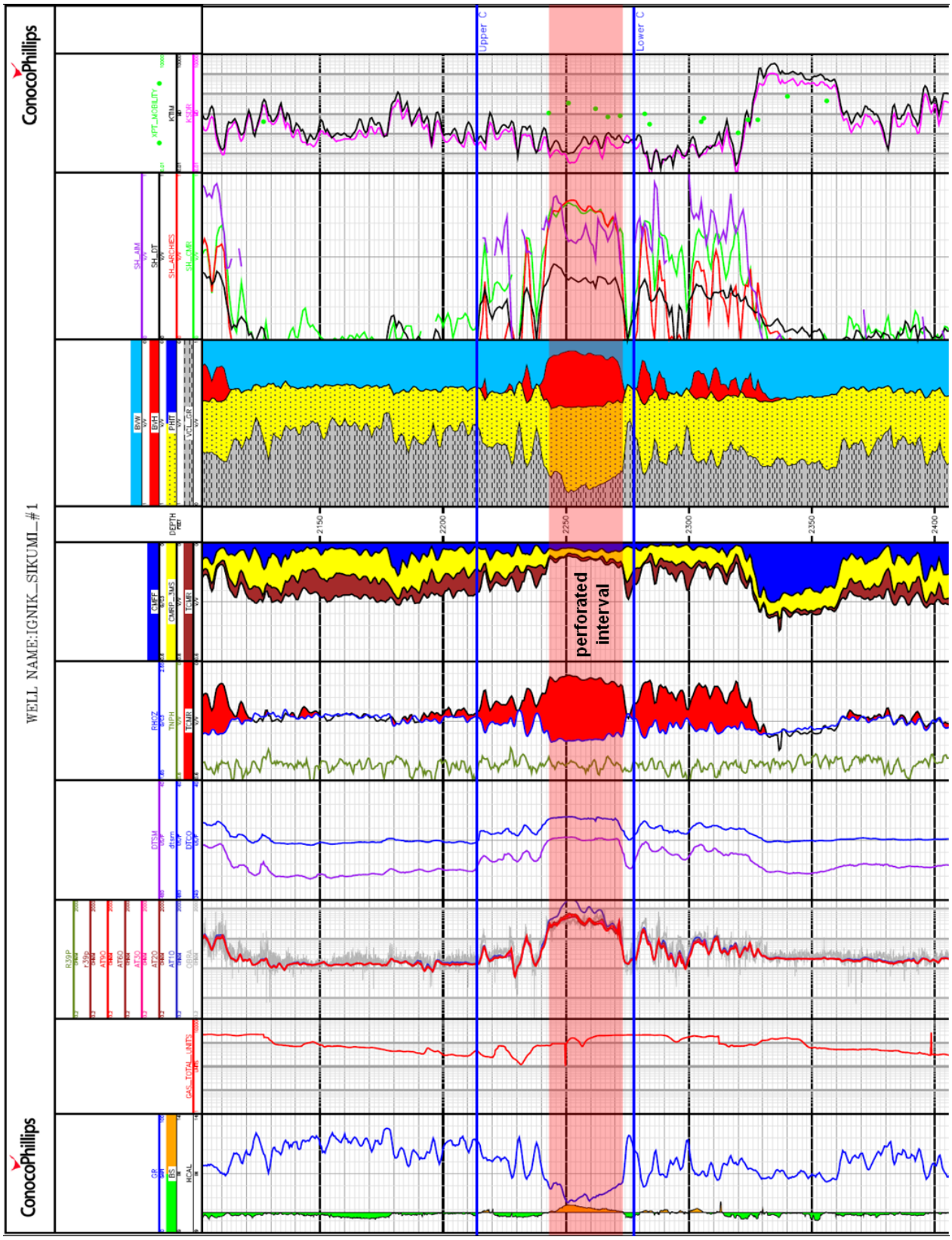

Figure 10: Iġnik Sikumi #1 Log Montage: Hydrate-Saturated Sagavanirktok C Sandstone

PERFS	DEPTH FEET	total porosity PHIT_2 V/V	hydrate saturation from CMR SH_CMR_1 V/V	water saturation from CMR SW_CMR_1 V/V	Clay Volume VCL_GR_2 V/V	GammaRay GR_1 GAPI	Temperature last DTS trace, 5/30 °F	Temperature AVG of 5/30 readings °F	Temperature last DTS trace, 9/08 °F	Temperature AVG of 9/08 readings °F	Fracture Closure Pressure per Dave Cramer, 6/3 "reservoir" psi	Fracture Closure Pressure "seal" psi	Reservoir Pressure Reservoir Pressure from XPT (per Dave Cramer, 6/3 Latifzai/SLB) Avg gradient psi	Reservoir Pressure C Sd gradient psi	Reservoir Pressure Actual XPT measurment psi	CMR Saturations (Howard/Klein) "capillary + clay-bound water" BFV_1 V/V	CMR Saturations (Howard/Klein) "clay-bound water" CBF2_1 V/V	CMR Saturations (Howard/Klein) "movable water" CMFF_1 V/V	CMR Saturations (Howard/Klein) "total water-filled porosity" TCMR_1 F3/F3	"Water-filled porosity" fraction DAS clay-bound water %	"Water-filled porosity" fraction DAS capillary-bound water %	"Water-filled porosity" fraction DAS movable water %
	2234	0.377061	0.613156	0.386844	0.237248	45.501	40.59	40.59	40.39	40.25	1412	1542	1034	1072		0.0781137	0.0212058	0.0608266	0.13884			
	2235	0.36643	0.608362	0.391638	0.261158	48.5958	40.6	40.59	40.26	40.26	1413	1542	1035	1072		0.104868	0.0340508	0.0518991	0.156766			
	2236	0.340358	0.526221	0.473779	0.299577	53.5686	40.61	40.60	40.29	40.28	1414	1543	1035	1073		0.177083	0.0765328	0.0242302	0.201313			
	2237	0.294642	0.305374	0.694626	0.396601	66.1271	40.61	40.61	40.47	40.29	1414	1544	1036	1073		0.210874	0.100432	0.0141487	0.225022			
	2238	0.263994	0.140836	0.859164	0.471055	75.7642	40.56	40.64	40.37	40.31	1415	1544	1036	1074		0.17576	0.0831418	0.0233187	0.199079			
	2239	0.27503	0.26572	0.73428	0.419223	69.0552	40.55	40.66	40.30	40.32	1416	1545	1037	1074		0.127178	0.0631521	0.0408665	0.168035	0.32	0.44	0.24
	2240	0.322915	0.46622	0.53378	0.316374	55.7428	40.64	40.68	40.37	40.33	1416	1546	1037	1075		0.10477	0.0317679	0.0563572	0.161128	0.20	0.45	0.35
	2241	0.362891	0.542835	0.457165	0.246237	46.6845	40.67	40.70	40.42	40.35	1417	1547	1038	1075		0.0957086	0.0289622	0.0475756	0.142285	0.20	0.47	0.33
	2242	0.352673	0.581074	0.418926	0.231595	44.7692	40.66	40.72	40.45	40.38	1418	1547	1038	1076		0.0596246	0.0158921	0.0322984	0.091923	0.17	0.48	0.35
perf	2243	0.3752	0.744824	0.255176	0.189487	39.3189	40.67	40.75	40.42	40.39	1418	1548	1039	1076	1077	0.0496859	0.0122132	0.0319334	0.0816193	0.15	0.46	0.39
perf	2244	0.409261	0.791653	0.208347	0.173443	37.2422	40.66	40.77	40.41	40.40	1419	1549	1039	1077		0.0594877	0.0162107	0.0368681	0.0963457	0.17	0.44	0.39
perf	2245	0.406564	0.755788	0.244212	0.209842	41.9536	40.68	40.79	40.46	40.42	1419	1549	1039	1077		0.0607997	0.0166005	0.0400686	0.100888	0.16	0.44	0.40
perf	2246	0.40223	0.739011	0.260989	0.213226	42.3916	40.73	40.81	40.53	40.43	1420	1550	1040	1078		0.0500946	0.0107282	0.0372062	0.0879008	0.12	0.45	0.43
perf	2247	0.3932	0.768643	0.231357	0.203428	41.1234	40.79	40.83	40.63	40.45	1421	1551	1040	1078		0.0478018	0.0063433	0.030482	0.0782839	0.08	0.53	0.39
perf	2248	0.392448	0.791851	0.208149	0.191194	39.5398	40.8	40.84	40.62	40.45	1421	1551	1041	1078		0.0479679	0.0034079	0.0286886	0.0766564	0.05	0.58	0.37
perf	2249	0.40003	0.799916	0.200084	0.135598	32.3437	40.75	40.84	40.60	40.46	1422	1552	1041	1079		0.0430961	0.0069578	0.0288934	0.0719894	0.10	0.50	0.40
perf	2250	0.405236	0.814497	0.185513	0.0967856	27.3199	40.73	40.84	40.56	40.47	1423	1553	1042	1079		0.0401702	0.0137494	0.0274972	0.0676673	0.20	0.39	0.41
perf	2251	0.402424	0.824383	0.175617	0.0834363	25.592	40.76	40.86	40.55	40.49	1423	1553	1042	1080		0.0426361	0.0140413	0.0281119	0.070748	0.20	0.40	0.40
perf	2252	0.403509	0.816872	0.183128	0.100362	27.7828	40.78	40.90	40.57	40.53	1424	1554	1043	1080		0.0458755	0.014651	0.0283021	0.0741777	0.20	0.42	0.38
perf	2253	0.403206	0.807867	0.192133	0.0931144	26.8447	40.88	40.91	40.64	40.54	1424	1555	1043	1081		0.0431567	0.0141312	0.0312754	0.0744321	0.19	0.39	0.42
perf	2254	0.401042	0.806226	0.193774	0.0963507	27.2636	40.96	40.92	40.70	40.55	1425	1555	1044	1081		0.0463946	0.0145269	0.0344967	0.0808913	0.18	0.39	0.43
perf	2255	0.39703	0.787499	0.212501	0.11142	29.2141	40.95	40.94	40.66	40.57	1426	1556	1044	1082		0.053341	0.0150028	0.0376048	0.0909458	0.16	0.42	0.41
perf	2256	0.401873	0.7642	0.2358	0.121131	30.4711	40.95	40.95	40.63	40.58	1426	1557	1045	1082		0.0487623	0.0146244	0.0443903	0.0931526	0.16	0.37	0.48
perf	2257	0.403533	0.759571	0.240429	0.128729	31.4545	40.91	40.96	40.61	40.57	1427	1558	1045	1083		0.0475363	0.0162231	0.0441136	0.0916498	0.18	0.34	0.48
perf	2258	0.400327	0.761612	0.238388	0.135451	32.3246	40.93	40.97	40.65	40.60	1428	1558	1045	1083		0.0490216	0.014455	0.0377671	0.0867888	0.17	0.40	0.44
perf	2259	0.398109	0.772852	0.227148	0.105252	28.4158	40.97	40.98	40.69	40.62	1428	1559	1046	1084		0.0447164	0.0064813	0.0379777	0.0826941	0.08	0.46	0.46
perf	2260	0.397012	0.782811	0.217189	0.10351	28.1903	41.03	40.99	40.75	40.62	1429	1560	1046	1084		0.0418772	0.0035621	0.0442301	0.0861074	0.04	0.44	0.51
perf	2261	0.397733	0.774404	0.225596	0.117604	30.0146	41.07	41.01	40.73	40.63	1430	1560	1047	1085		0.0436701	0.0057066	0.0452096	0.0898797	0.06	0.42	0.51
perf	2262	0.3944	0.762645	0.237355	0.11663	29.8885	41.05	41.01	40.63	40.65	1430	1561	1047	1085	1092	0.0452442	0.0063129	0.0414256	0.0866699	0.04	0.48	0.48
perf	2263	0.396321	0.77204	0.22796	0.127144	31.2494	41.05	41.02	40.70	40.66	1431	1562	1048	1086		0.049414	0.0092803	0.0329691	0.0824032	0.11	0.49	0.40
perf	2264	0.396939	0.783584	0.216416	0.135587	32.3397	41.06	41.03	40.78	40.68	1431	1562	1048	1086		0.0622468	0.0232247	0.0337752	0.0960217	0.24	0.41	0.35
perf	2265	0.399752	0.749924	0.250076	0.138681	32.7427	41.06	41.04	40.85	40.70	1432	1563	1049	1087		0.0661496	0.0159439	0.045421	0.111571	0.14	0.45	0.41
perf	2266	0.396333	0.699909	0.300091	0.14671	33.7819	41.06	41.05	40.91	40.71	1433	1564	1049	1087		0.061911	0.0147614	0.0505238	0.112435	0.13	0.42	0.45
perf	2267	0.398515	0.683428	0.316572	0.154487	34.918	41.07	41.06	40.87	40.70	1433	1564	1050	1088	1082	0.0569285	0.0217814	0.0485922	0.105521	0.21	0.33	0.46
perf	2268	0.393048	0.703035	0.296965	0.162518	35.8231	41.09	41.08	40.88	40.73	1434	1565	1050	1088		0.0560736	0.0174721	0.0449302	0.101006	0.17	0.38	0.44
perf	2269	0.390909	0.724266	0.275734	0.176271	37.6082	41.12	41.10	40.92	40.77	1435	1566	1051	1089		0.0673501	0.0136947	0.0410437	0.108393	0.13	0.50	0.38
perf	2270	0.371648	0.697154	0.302846	0.179191	37.9862	41.11	41.11	40.91	40.77	1435	1567	1051	1089		0.0808854	0.023331	0.0443812	0.125267	0.19	0.46	0.35
perf	2271	0.361248	0.640941	0.359059	0.195886	40.1472	41.07	41.12	40.89	40.78	1436	1567	1051	1090		0.0760181	0.0230715	0.0442642	0.120282	0.19	0.44	0.37
perf	2272	0.375485	0.668104	0.331896	0.202259	40.9721	41.02	41.13	40.89	40.79	1436	1568	1052	1090	1088	0.0952361	0.0143062	0.0364327	0.131659	0.11	0.61	0.28
perf	2273	0.376218	0.637938	0.362062	0.216212	42.7781	40.97	41.15	40.97	40.81	1437	1569	1052	1090		0.18998	0.0406196	0.0253147	0.215295	0.19	0.69	0.12
	2274	0.313576	0.301934	0.698066	0.349246	59.9976	40.95	41.15	41.04	40.83	1438	1569	1053	1091		0.259009	0.0808287	0.0195688	0.278579	0.29	0.64	0.07
	2275	0.267139	0	1	0.502193	79.7947	40.9	41.16	40.98	40.84	1438	1570	1053			0.244544	0.0904397	0.022492	0.267035	0.34	0.58	0.08
	2276	0.276406	0.0325745	0.967426	0.517048	81.7174	40.94	41.17	40.93	40.85	1439	1571	1054			0.199134	0.0744931	0.0275285	0.226663	0.33	0.55	0.12
	2277	0.293352	0.218226	0.781774	0.468851	75.479	41.2	41.21	40.93	40.87	1440	1571	1054			0.179629	0.0747257	0.029471	0.209099	0.36	0.50	0.14
	2278	0.289588	0.267741	0.732259	0.420346	69.2006	41.26	41.22	40.97	40.90	1440	1572	1055			0.170225	0.0765782	0.0343493	0.204575	0.37	0.46	0.17
	2279	0.303109	0.313807	0.686193	0.40308	66.9658	41.19	41.23	41.04	40.92	1441	1573	1055			0.128809	0.041218	0.0401644	0.168973			
	2280	0.344739	0.4966	0.5034	0.308486	54.4629	41.2	41.25	41.10	40.95	1442	1573	1056			0.0910881	0.0083496	0.0302713	0.121359			
	2281	0.378436	0.667946	0.332054	0.210762	42.0727	41.2	41.26	41.10	40.96	1442	1574	1056			0.0831081	0.0092537	0.0231706	0.106278			
	2282	0.388473	0.715869	0.284131	0.188517	39.1933	41.18	41.25	41.02	40.98	1443	1575	1057			0.0791429	0.0200834	0.0239418	0.103085			
	2283	0.370042	0.71067	0.28933	0.219065	43.1474	41.22	41.26	40.99	40.98	1443	1575	1057			0.0824107	0.0374331	0.0134943	0.0959051			
	2284	0.334406	0.702505	0.297495	0.268678	49.5692	41.29	41.28	41.00	40.98	1444	1576	1057			0.119248	0.0600407	0.0108274	0.130075			

Table 2: Iğnik Sikumi #1 Petrophysical Reservoir Characterization

2012 Well Test Operations

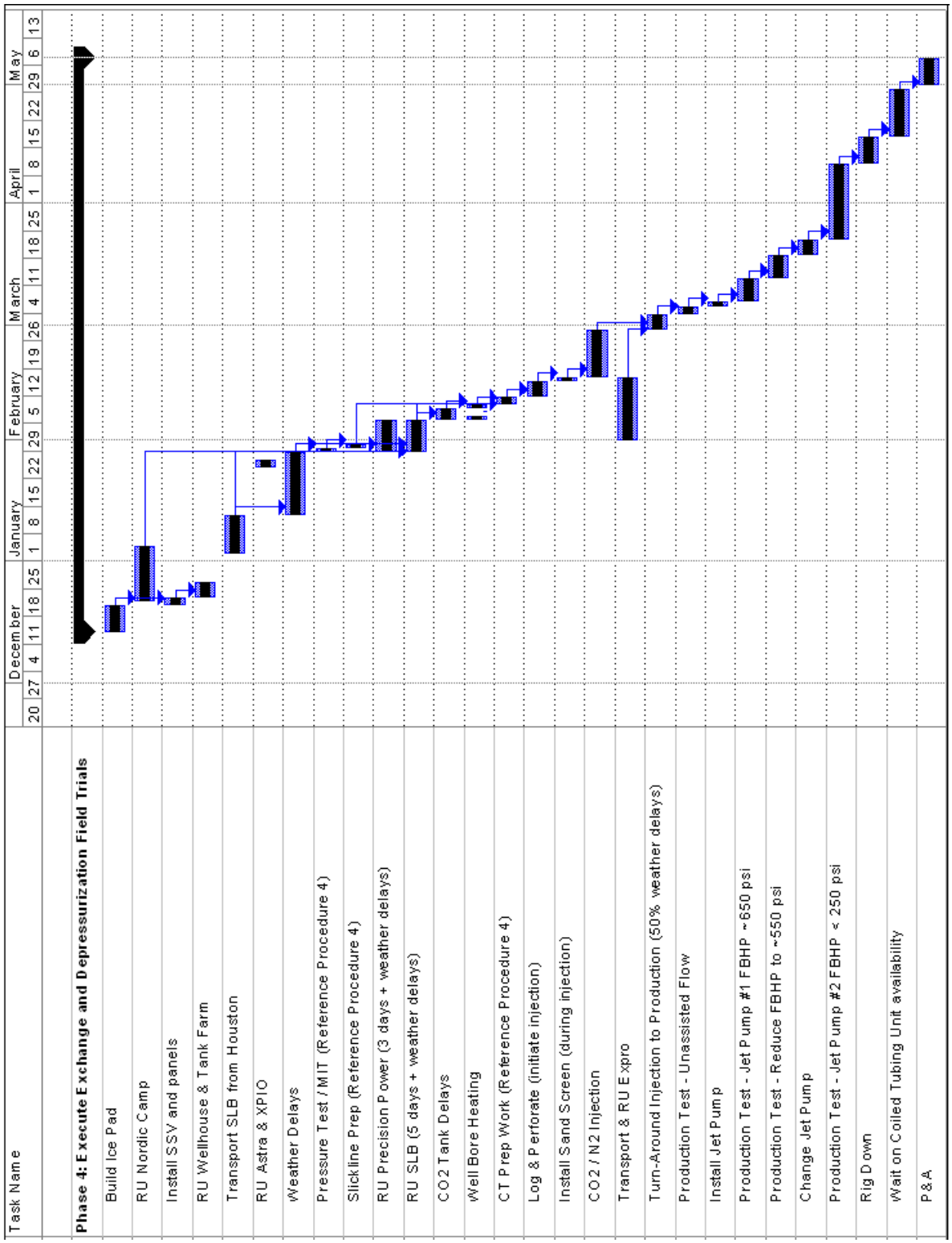

Figure 11: Operations Timeline

Daily Reports from WellView

Detailed daily reports follow this heading for sixty-four pages

ConocoPhillips
Wellview Web Reporting

Time Log & Summary Report

Well Name: IGNIK SIKUMI 1
Job Type: TEST-LOG-PROFILE

Rig Name: CPAI IGNIK WELL TEST
Rig Accept: 1/12/2012 12:00:00 AM
Rig Release: 5/4/2012 10:00:00 PM

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
01/12/2012	**24 hr Summary** Attended morning PJSM at Ignik Camp with camp personell and Prec. Power Electrician, Simplex Grannell. Spot Precision Power equipment (2 gen sets, 2 fuel tanks, switch shack, equip. shed) in containment area. Applied heat to warm up equip. Set Wellhouse and applied heat to warm up tree. Continued working on camp. Wiring up alarm system (smoke detectors), telephones and computers. Bullcooks continue to prep rooms and kitchen. Super - chlorinated water has been circulated thru water system, waiting 24 hrs before flushing and testing. Lined up 3rd party services for potable water and waste water. Held pre-planning Gen-set installation duct work meeting.									
	00:00	00:00	24.00			SURPRI	FLOWT	RURD	P	Attended morning PJSM at Ignik Camp with camp personell and Prec. Power Electrician, Simplex Grannell. Spot Precision Power equipment (2 gen sets, 2 fuel tanks, switch shack, equip. shed) in containment area. Applied heat to warm up equip. Set Wellhouse and applied heat to warm up tree. Continued working on camp. Wiring up alarm system (smoke detectors), telephones and computers. Bullcooks continue to prep rooms and kitchen. Super - chlorinated water has been circulated thru water system, waiting 24 hrs before flushing and testing. Lined up 3rd party services for potable water and waste water. Held pre-planning Gen-set installation duct work meeting.
	00:00	00:00	0.00			SURPRI	RPEQPT	PULL	P	1-4-12 Pulled BPV and confirmed no VR plugs in annulus valves. Installed integral flanges and associated jewelry.
01/13/2012	Spot PP GenSets, Fuel Tanks, Switch Shack & apply heaters to warm up. Continue prepping camp.									
	00:00	00:00	24.00			SURPRI	FLOWT	RURD	T	All outside work ceased due to Phase weather conditions. Continued on inside camp work (fire detection system and water). Sent water samples to Lab for potable water. Install fire detection control panel.
01/14/2012	Weather hold Phase II. Continue on camp inside work.									
	00:00	00:00	24.00			SURPRI	FLOWT	RURD	T	Weather day, all outside work on hold for high winds and cold temps.
01/15/2012	Prep WH for Skimpy Panels, Spot rig mats for CO2 tanks. Move snow									

Time Logs

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	00:00	00:00	24.00			SURPRI	FLOWT	RURD	T	Clear snow after blizzard. Set rig mats & cribbing prepping for floats. Start installing duct work on Gen Sets. Precision Power connected fuel tanks to Gen Sets, preped Gen Set and Swich Gear Shear for start up. Continued prepping camp for move in.
01/16/2012	Clear snow from pad from blow. Spot two floats and rig mats for setting CO2 & N2 tanks. Install platform inside wellhouse and install Skimpy Panels for both SSV's. Continued hookups for Prec. Power GenSets. Shut down all outside work because of Phase II weather.									
	00:00	00:00	24.00			SURPRI	FLOWT	RURD	T	Clear snow from pad from blow. Spot two floats and rig mats for setting CO2 & N2 tanks. Install platform inside wellhouse and install Skimpy Panels for both SSV's. Continued hookups for Prec. Power GenSets. Shut down all outside work because of Phase II weather.
01/17/2012	Weather hold, 25-35 MPH winds / Phase I/II. Continued working on Hook ups to Gen sets until weather hold. Civil crew worked on permanent well head platform and hung one Skimpy pannel. Spotted rig mats and floats for cryo tanks.									
	00:00	00:00	24.00			SURPRI	FLOWT	RURD	T	On weather hold, Phase conditions. Plan to perform camp safety inspection pending weather.
01/18/2012	Attempted to reach camp mid day for safety inspection convoy turned around at 1D pad due to poor driving conditions. Winds reduced during the night DTH able to remove snow with dozer and loader.									
	00:00	00:00	24.00			SURPRI	FLOWT	RURD	T	All outside work shut down due to Phase II weather. Camp alarm installation completed and tested.
01/19/2012	CPAI Safety performed camp safety inspection. Camp is approved for occupancy. Civil crew Installed second surface safety valve panel and continued work on permanent well head platform. Spotted SLB N2 tanks, CO2 tank, GMS, Line Heater, and SLB tool house									

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	00:00	00:00	24.00			SURPRI	FLOWT	SFTY	P	Performed camp safety inspection mid morning with Al Bergh - Gary Gauthier CPAI safety and Keith Dukowitz Nordic camp manager. Camp is approved for occupancy. Precision power back up genset (power to block heaters on mains) went down during the blow. Back up has been taken in for servicing. Construction need to build stairs and a cat walk to fuel the Precision power tanks. Ordered out additional snow removal around precision power equipment and SLB staging sites. Two light plants and one heater down, requested service. Lynden delivered SLB equipment standing by for Peak crane. Civil crew continues to work on permanent well head platform. Second skimpy panel mounted. 3:50 pm spot crane to pic N2 tanks, CO2 tank, GMS, Line Heater, and SLB tool house.
01/20/2012	Off loaded remaining palletized SLB equipment from trailers. Installed temporary power the GMS unit for lights and heat. Unloaded GC, GMS computers, and Well Site Data Hub. Installed exhaust louver on Well site Gen set #1.									
	00:00	00:00	24.00			SURPRI	FLOWT	RURD	P	Phase 1 Level 1. Contacted SimOps for scaffolding crew to build stairs and catwalk to access fuel hatch during fueling of well site generators. 9:00 Held prejob safety meeting with Al Bergh CPAI safety, loader operator, SLB crews. Discussed off loading of remaining pallets from Lynden trailers, installation of well site gen set louvers. John Brooks Precision power to investigate temp power to GMS unit and SLB skid until main gen sets can be fueled. SLB crews pulled shipping plywood from GMS and removed snow from revetments around the 400 bbl upright tanks and 125 bbl Glycol tank and begin rigging up fittings. Precision power was able to run a temp power line to the GMS. The lights are on and the unit is warming up. One exhaust louver was successfully installed on Gen set #2. SLB transported the Gas Chromatograph, GMS computers, and the Well Site Data Hub to location. Phase 1 canceled at 5:30 pm Scaffold crew scheduled to walk down job site at 7:00 am.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
01/21/2012	**24 hr Summary** Held pre job safety meeting. Unloaded and staged construction material. Installed exhaust louver on well site generator #2. Scaffold crew walked down job will return to construct stairs to access fuel tanks. Crews installed SLB treating line revetments. GMS unit is warm. Well head platform work ongoing.									
	00:00	00:00	24.00			SURPRI	FLOWT	RURD	P	06:00, held pre job safety meeting in conference room. DTH loader operator stuck behind rig move showed up after 9:00 with trailer of construction material. Unloaded and staged construction material. Installed exhaust louver on well site generator #2 and fuel lines to both generators. Civil crew also stuck behind rig move showed up after 9:00 begin working on permanent well head platform. Platform required extensive modification due to tree design with double SSVs above the deck. Scaffold crew showed up ~10:00 to walk down job and left. Hand-Y-Berm & SLB crews laid out treating line revetment for all SLB lines. Temporary gen set on GMS and Precision Power main generator block heaters failed. Gen set rigged down, removed and replaced. Temp Power to GMS back on entire unit is warm. Civil crew rigged down for the day, platform work ongoing. Held post job safety / planning meeting 19:00.
01/22/2012	Held prejob safety meeting. On weather hold, ambient temp below -35. DTH loader opperated under variance to assist in trenching. installed SLB and HES fiber optic leads from camp to well house and GMS. Terminated SLB leads in camp and at GMS. Terminated HES leads at camp.									

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	00:00	00:00	24.00			SURPRI	FLOWT	RURD	P	0600 pre job safety meeting. Wind chills -50 - conducted safety assessment. 0700 HES crew on location prepping to lay fiber optic cable. 0730 ambient temp dropped to -36 all hydraulic equipment idled, per support groups cold weather operating policy. Canceled trenching operations regrouped and held ops meting. 0800 SLB mechanic and Precision power electrician on site moving forward with burner installation. 0900 cold weather variance signed with DTH allowing loader operations below -35F ambient. DTH dispatched with materials for insulated containment and loader mounted trenching device. 1030 -38 F ambient. HES setting up DAS DTS equipment. 1515 making up 1" jointed conduit to burry SLB and HES lines. Gouged out a 4" trench from camp to the well house. Made up 1" rigid conduit, snaked HES and SLB lines through conduit to well head and GMS unit, lay conduit in trench and packed ice back in the trench. Terminated SLB leads in the GMS and camp. Terminated the HES leads in camp. -42 F.
01/23/2012	Held pre job safety meeting. Wind chills -80, -51F ambient. Found ATF leak on pad after truck backed away from containment. Vehicle secured, Security notified and PIR e-mailed. Scaffold crew installed stairs to fuel tanks. Watered in the trench containing the fiber optic lines to the well. Crews laid out blue board insulation for all SLB surface lines and installed the 1502 high pressure treating iron gas line from the GMS to the well. SLB lost connectivity between their fiber optic line some time between 1100 and 1200. SLB mechanic installed the line heater burner assembly and Peak precision power hooked up temporary power. Attempted to test fire the burner but had issues with the controller.									

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	00:00	00:00	24.00			SURPRI	FLOWT	RURD	P	0600 pre job safety meeting. Wind chills -80, -51F ambient - conducted safety assessment 0844 found ATF leak on pad in front of camp. Found Peak truck # K307 with transmission leak. Truck turned off, containment pool placed under transmission and tow truck called. Security notified and PIR e-mailed out. 0945 scaffolding crew on location setting stairs to fuel tank. 0952 watering in the trench containing the fiber optic runs to the well. SLB crew drove to DTH to cut support blocks for treating iron. 1200 scaffold crew finished stairs and catwalk to fuel tanks. Bulk fuel truck ordered, ETA 0800 1-24 Crews laid out blue board insulation for all SLB surface lines and installed the 1502 high pressure treating iron gas line from the GMS to the well. SLB lost connectivity between their fiber optic line some time between 1100 and 1200. Efforts were made to reestablish connectivity through all 6 pairs but failed. HES aided by measuring the distance of the continuous fiber optic line. It appears as if the break is near the well head. . SLB mechanic installed the line heater burner assembly and Peak precision power hooked up temporary power. Attempted to test fire the burner but had issues with the controller. SLB is scheduled to call burner manufacturer in the am. Temperatures continue to be very cold all outside work is very slow with warm ups.
01/24/2012	Held pre job safety meeting. Wind chills -80, -51F ambient. Discussed continued cold weather and plan forward. All outside labor shut down unless work can be carried out with an enclosure and use of direct fired heaters to provide protection from the elements. SLB safety presented COP cutting policy, foul weather policy, traction policy, impact gloves, and when to go to the medic to the crew. Burner on the line heater fired successfully. No success reestablishing connectivity in the SLB fiber optic lines.									

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	00:00	00:00	24.00			SURPRI	FLOWT	RURD	T	0600 safety / ops meeting. Discussed continued cold weather and plan forward. Well site fuel tank prepped for fuel delivery, wind break set up and nut plug down. 0800 call from town to discuss cold weather operations. All outside labor shut down unless work can be carried out with an enclosure and use of direct fired heaters to provide protection from the elements. Walking traffic allowed between the camp and GMS, work allowed in the GMS, well house, equipment connex, and line heater hooch, with hand tools, no power tools, large hammers or saws. On weather hold. Called CH2Mhill dispatch and canceled bulk fuel delivery until the weather breaks. Non mobile fuel continues as well as trucking of potable and waste water. 1328 SLB established connectivity to the Well Site Data Hub through the COP network. 1517 Peak wrecker leaving location with peak box van # K307. 1530 SLB safety held safety presentation covering COP cutting policy, foul weather policy, traction policy, impact gloves, and when to go to the medic. Burner on the line heater fired successfully. No success reestablishing connectivity in the SLB fiber optic lines. Water found in the conduit may have expanded and damaged the cable.
01/25/2012	Held pre job safety meeting. Wind chills -80, -51F ambient. Found ice free conduit 70' back from the well head but unable to move cable. Mounted Isco syringe pump in GMS. Crew change. Extreme cold weather hold.									
	00:00	00:00	24.00			SURPRI	FLOWT	RURD	P	Held pre job safety meeting. Wind chills -80, -51F ambient. 0729 found ice free conduit pipe 70' back from the well head attempting to move wire. It wiggles freely but will not pull by hand. Took 100' of 3" soft hose to KIC to warm it up in the shop. Mounted Isco syringe pump in GMS. Precision Power electrician checked fluids on the temp power gen set. Crew change.
01/26/2012	Continue to wait on weather. Reviewed site control/safe work area with crews. Fiber optic line pulled free in conduit. Held pre job meeting to discuss reinstalling cable then pulled additional cable to well head through new conduit. Reestablished connectivity to the GMS skid though the SLB fiber optic line. Established connectivity with XPIO, Gauge #1 937.602 psi Temp 41.004F, Gauge #2 909.061 psi Temp 40.236F, Gauge #3 816.561 psi Temp 36.557F While fueling temp generator riser burped spilling1/2 gal diesel into secondary containment. Diesel cleaned from containment with adsorbent and bagged for disposal.									

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	00:00	00:00	24.00			SURPRI	FLOWT	RURD	P	0600 ops / safety meeting, new crew orientation. 0630 engineering ops call in. 0700 site control/safe work are review with crews. 0824 GMS temp gen set went down ½ tank of fuel, GMS still warm. 0900 lost three heaters. 0930 water truck attempting delivery frozen off, returning to shop to thaw. Fill in camp manager and staff alerted. Comm with crews to conserve water. 1100 attached cable clamp and com along to SLB fiber optic bundle. Applied a small amount of tension and cable popped loose, entire string is moving freely. Crews in for lunch and warm up. 1247 pre job meeting to discuss reinstalling cable. replacement heaters on location. Performed Visible fault locator (VFL) check of SLB cable, checked ok. Cleared trough of drifted snow and residual ice. Lay out replacement conduit. 1500 temp gen set back online. water delivered to camp. 1530 pulled additional cable to well head trough new conduit. 1545 new fiber pulled to GMS and well house. Checked SLB with VFL, checked ok. Pulled HES line into well house and SLB cable into GMS break for warm up. Spliced connectors onto the end of SLB fiber. 1900 connectivity to the GMS skid though the SLB fiber optic line. Temp gen set to GMS back down. Called electrician to replace GMS generator. No spare gen set at this time. Bringing new alternator. Established connectivity with XPIO, Gauge #1 937.602 psi Temp 41.004F, Gauge #2 909.061 psi Temp 40.236F, Gauge #3 816.561 psi Temp 36.557F. 2100 electrician on site fueler on site. While fueling temp generator riser burped spilling1/2 gal diesel into secondary containment. Diesel cleaned from containment with adsorbent and bagged for disposal. Well Supt, notified, security notified, PIR emailed.
01/27/2012	HES acquiring data with DTS and DAS. Optimation established conection from GMS through Well Site data Hub to Interact server and transferred data. Modified Precision power temp gen set fuel fill riser. Had safety / ops meeting with CH2M Hill fuelers Filled temp gen set with no issues.									

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	00:00	00:00	24.00			SURPRI	FLOWT	RURD	P	0600 ops / safety meeting, new crew orientation. 0630 engineering ops call in. Water truck and fuel truck on location. Filling camp and non mobile equipment then bulk generator fuel tank. Additional safety/ spill discussion outlining fill procedure and spill mitigations regarding temp generator and bulk well site fuel tank. 0900 HES at well head terminating DTS and DAS lines. Optimation established connectivity from GMS through Well Site Data Hub (WSDH) to SLB interact server in Sedalia. Precision power on location, installed shorter fuel riser ~ 4", stood by for fueling procedure, flagged and attached long fuel riser to generator for reinstallation before temp gen set is moved. Gen set fueled with no issues, elevated the front end, installed 4" riser. Discussed fueling the generator bulk tank. This is not the bulk hose, they have no connection to dry lock. Abort attempt until proper hose with dry lock can be used. Held safety ops meeting with CH2M Hill fuelers regarding 5000 gal bulk tanks fill procedure. 2" dry lock male to be installed on ULSD generator tank. 3" male dry lock to be installed on LEPD tank for line heater. Small fuel truck to be used for filling camp, non mobile equipment, and well site generators. Large bulk truck will be used to fill SLB line heater. 1425 HES terminating their fiber optic cable at the camp. 1500 acquiring DAS data. 1600 acquiring DTS data. 1800 SLB crew performed walk around. Temp GMS gen set still operating.
01/28/2012	Valve crew serviced tree valves and filled flow back SSV with hydraulic fluid. Rigged iron from GMS to edge of well house on fluid side and from well house to 125 bbl tank on flow back side. Hooched and heated main power spools									

Time Logs

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	00:00	00:00	24.00			SURPRI	FLOWT	RURD	P	0600 ops / safety meeting. 0630 engineering ops call in. Phase 1 driving conditions due to slick roads, drifting snow, and lack of maintenance. Scheduled Down Hole Diagnostics (DHD) crew to perform MITT / MITIA on 1/22/12. Contacted valve shop re service tree valves. Discussion over wind chill as it relates to equipment. Scheduled to service tree as soon as reasonably possible. Lost 3 heaters during the night. 0900 day mechanic on location to start loader. Requested Peak Precision power bring grinder and ground plates for bonding. 1320 loader up and running waiting on DTH operator. 1400 valve crew on location to service tree. 1420 loader operator on location spotting power cables. 1530 valve crew serviced tree valves and filled flow back SSV with hydraulic fluid. Attempted to fill injection side SSV with hydraulic fluid, exterior mounted dump valve failed and was leaking by to dump reservoir. Rigged iron from GMS to edge of well house on fluid side and from well house to 125 bbl tank on flow back side. Hooched and heated main power spools. Loader operator smelling fumes in cab suspects heater core leak. No drips apparent. Stopped loader, attached drip pan to loader with sash cord and returned the loader to KOC shop for PM / repair.
01/29/2012	Pulled wire to all SLB equipment, ongoing. Lay out and rigged up hard hose, ongoing. Performed MIT-T - Passed, MIT-IA, passed. IA shows communication with the chemical injection line. Drift well to 3.58" to 2350'									

Time Logs

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	00:00	00:00	24.00			SURPRI	FLOWT	RURD		0600 ops / safety meeting. 0630 engineering ops call in. 0800 DHD on location, held pre job, issues with wellbore sync, reviewed well bore schematic and procedure with crew.0926 DTH on location delivering cut plywood for revetment base. Peak Precision power on location running small gauge wire. 0930 DTH update on loader approximately 1 hr out. 1030 DHD on location to perform MITT / MITIA. Fluid levels at surface, T/I/O = 0/0/40 CI=0 Heater =0 Pumped IA to 400 and tubing to 3000 psi. Start T/I/O = 3000/440/40 CI = 420, Heater 510. 15 min T/I/O=2900/400/40 CI =445 Heater 500. 30 min T/I/O = 2850/400/40 CI=440 Heater 400. 45 min T/I/O = 2850/400/40 CI=325 Heater = 390. Tubing passed. Bleed CI line, IA tracked. Bleed Tubing. MITIA initial T/I/O = 600/75/40/ CI = 0 Heater = 50. Start T/I/O = 100/3000/40 CI 2950 Heater = 2950. 15 min T/I/O = 1050/2800/40 CI=2800 Heater= 2810. Bumped pressure, T/I/O = 1100/3000/40 CI=3000 Heater= 3000. 15 min T/I/O= 1100/2960/40 CI=2960 Heater = 2950. 30 min T/I/O = 1100/2950/40 CI=2940 Heater = 2950 Passes IA to T but CI in communication with the IA. Bleed CI line, T/I/O 1080/2525/40 CI=2500 Heater =2500. Bleed CI line second time T/I/O 980/1950/40 CI=1925 Heater 1960. Shut down stung into test port with test tool, void at 0 psi, clean test fluid. Tried to bleed CI again will not bleed down, frozen line at bleed tank. Thaw lines and pump 10 gal diesel down CI line. Rig down DHD. Run power lines to all electrical. SLB equipment and begin to terminate lines. Lay hard hose from 125 bbl tank to GMS continue to build insulated boxes. Slick line on location, RU, drift W 3.58" to 2350' RDMO
01/30/2012	Temps dropped to -40 F. Filled well site generator tank. Installed discharge hoses from GMS to SLB line heater and GMS to 125 bbl tank. Staged tree iron in well house. Terminated GMS power lead at switch shack and both leads of SLB connex.									

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	00:00	00:00	24.00			SURPRI	FLOWT	RURD	P	0600 ops / safety meeting. 0630 engineering ops call in. 0700 walked through possible wellview reporting issues with support. Can't find a problem. Note, some time log entries on second page of report because they are too long and not broken out. 0745 -35F winds calm. 0859 cold weather alert -36F all hydraulic driven equipment need Supt variance to operate. 0915 alerted that the camp has no water service. Water back up, then down, then up again. Fueled the well site generator main tank 3700gal. Constructed and installed all discharge hose from SLB line heater to GMS and GMS to 125 bbl open top tank. Valves and T's placed to tie into Expro treating lines once on location. Heated all high pressure valves on SLB heater, shut in bypass, opened suction and discharge valves. Staged tree iron in well house. 1245 -40 F ambient crews traveled to KOC for CPA Supt orientation meeting and to construct hard hoses in KOC shop. Precision power terminated GMS power leads at switch shack and both leads of SLB connex.
01/31/2012	Unloaded 3700 gals. USLD fuel for Glycol Heater. Continue building blue board boxes for hoses. Accepted dilivery of 4000 gals N2 and loaded into N2 tanks. . Hardwire CO2 tank electrical plug. Optimation worked on Inter-Act channels for data transfer.									
	00:00	12:00	12.00			SURPRI	FLOWT	OTHR	T	Cold weather alert -36F all hydraulic driven equipment need Supt variance to operate.Current conditions -44F Winds SW 6 mph. Unloaded 3700 gals. USLD fuel for Glycol Heater. Continue building blue board boxes for hoses.
	12:00	00:00	12.00			SURPRI	FLOWT	RURD	P	Accepted dilivery of 4000 gals N2 and loaded into N2 tanks. Discovered that CO2 tank plug is incorrect. Made dicission to hardwire CO2 tank (original plan). Optimazation worked on Inter-Act straightening out channels.
02/01/2012	Attend morning PJSM. Continue SLB hookup as much as possible under weather conditions. Peak ordered disconnects for transfer house.									
	00:00	12:00	12.00			SURPRI	FLOWT	OTHR	T	Cold weather alert -36F all hydraulic driven equipment need Supt variance to operate.Current conditions @ 0600 hrs -46F Winds SW 6 mph, temps dropped to -51 F.

Time Logs

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	12:00	00:00	12.00			SURPRI	FLOWT	OTHR	P	Continued blue board construction. Change out day for SLB. Built blanking caps for PT lines w/N2. Hang fall retractable harness on line heater. Put double thread 206 on suction and discharge of 125 bbl tank for Expro hookup. Worked on connex. Work on N2 guages. Made supply and return hoses for N2 and CO2. Peak ordered disconnects for transfer house. Waiting on parts for finishing electrical.
02/02/2012	Electricians pulled wire, relocate and reconnect transformer. Ground all equipment present on location . SLB continued blue board boxes. Pressure test all lines. Pressure test all lines and work on blue board.									
	00:00	12:00	12.00			SURPRI	FLOWT	RURD	P	Temps warmed up this morning -29 F. Resumed work. Electricians pulled out 500 MCM cable from GMS skid. Relocaated 50 amp fuse disconnect. C/O transformer to SLB tool house. Reconnect heaters to 50 amp disconnect to SLB tool house power feeder. Everything on site except Expro equipment (not arrived) has been grounded. Mounted 100 amp disconnect to CO2 tank. Parts have been Goldstreeked today. ETA = Friday.
	12:00	00:00	12.00			SURPRI	FLOWT	RURD	P	SLB, pressure test hoses & secure to hard line. Work on blue board. Expro crew arrived, set in on Kuparuk Orientation and issued badges.
02/03/2012	Filled line heater w/Tritherm 42 bbls. Tested chem. inj. line to 1100 psi (ice plug?). Performed PPOPT test on uper seal seal of W.H. Pressure test hoses with air. Installed knife for connex heat and CO2 tank.									

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	00:00	12:00	12.00			SURPRI	FLOWT	RURD	P	PJSM & opts meeting w/ SLB & Expro & Pinnacle. Covered all orientations, site control, Kuparuk and the 2012 Denali Ascent. Load SLB line heater w/42 bbls TriTherm. Performed PPPOT Test on top seal of wellhead. Set rack of N2 bottles near wellhouse. Installed a high pressure hose from the IA to the open top tank w/needle valves to control bleed to the bleed tank. Install high pressure hose from the N2 bottles to the Chemical injection valve on the wellhead. Opened N2 bottles to the needle valve on the chem. inj. line (1100 psi bottle pressure) Open needle valve to the chem inj. line and it pressured up immediately to 1100 psi. Held pressure for 10 min. No movement. Closed needle valve, bled press from hoses and disconneted. Bled pressure down from chem. inj. line from 1100 psi to 0. Closed needle valves. RD.
	12:00	00:00	12.00			SURPRI	FLOWT	OTHR	P	Pressure test discharge hoses. Attempt to run line heater and adjust burners but unable to get fuel from Precision fuel tanks. Applied heater to suction lines. Hooked up pressure sensor cords from GMS to tanks. Pressure test hoses from N2 & CO2 tanks. Knife swithch installed for the CO2 tank. Knife switch for the connex heat installed.
02/04/2012	Finish Blue board, work on Fuel Tanks, dial in Heater, install SSV Control in GMS, mounted all disconnet & wired, terminate to GMS & bring Gen on line.									
	00:00	12:00	12.00			SURPRI	FLOWT	RURD	P	PJSM w/ both crews (SLB & Expro). SLB clear fuel lines and get fuel flowing from tank to line heater and generators. Start up line heater and adjust burner. Install SSV control in opts cab of GMS. Installed battery covers on valves on N2 & CO2 tanks & electric cords. Finished blue board boxes.
	12:00	00:00	12.00			SURPRI	FLOWT	RURD	P	Mounted and wired 4 disconnects. Terminate to GMS and bring Generators on line. Expro cleaning out tank farm containment removing snow and prepping for arrival of equipment.

Time Logs

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02/05/2012	**24 hr Summary** Received and unloaded Atigun House and two other loads for Expro. Rig up to well for warming ops. Double check that we are able to pump down the flatpack, or the annulus. Also verified we can circulate as planned. PT Hardline for Glycol system Wire in AC to CO2 Tank, Test¿ Peak CO2 Tank Power Umbilical for CO2 Transport Pressure test HP Glycol lines. Ensure we have valves to circulate through the heating coils. Displace Diesel into 125 BBL Tank									
	00:00	12:00	12.00			SURPRI	FLOWT	OTHR	P	Received and unloaded Atigun House and two other loads for Expro. Rig up to well for warming ops. Double check that we are able to pump down the flatpack, or the annulus. Also verified we can circulate as planned. PT Hardline for Glycol system Wire in AC to CO2 Tank, Test¿ Peak CO2 Tank Power Umbilical for CO2 Transport
	12:00	00:00	12.00			SURPRI	FLOWT	OTHR	P	Pressure test HP Glycol lines. Ensure we have valves to circulate through the heating coils. Displace Diesel into 125 BBL Tank
02/06/2012	Transfer load of CO2 to tank. Continue to circulate warming wellbore. Trouble shoot main generator, and connect up Expro. Expro continue to rig up.									
	00:00	12:00	12.00			SURPRI	FLOWT	OTHR	P	Continue circulating Glycol/water adjusting the circulation temps & rate through the line heater to manage the wellbore temperature. Brought temps up at 60' to 32 F, 61F at the turn around 1968'.
	12:00	19:00	7.00			SURPRI	FLOWT	OTHR	P	Expro continue rig up and waiting delivery of last two loads of equip. CO2 arrived, purged tank and loaded 22 tons into our tank. PP electrician trouble shoot generator and hard wire power from the gen-set to the heater for the CO2.
	19:00	00:00	5.00			SURPRI	FLOWT	OTHR	T	Ceased operations to work on CO2 tank. Wait on CO2 transport to return and empty tank. Contacted BP L&V Pad Operator and advised of small CO2 leak and will keep him advised.
02/07/2012	Install guard rails around CO2 tank upwind. Wait on Air Liq. CO2 transport to come back and empty CO2 tank.									
	00:00	00:00	24.00			SURPRI	FLOWT	OTHR	T	Install guard rails around CO2 tank upwind. Wait on Air Liq. CO2 transport to come back and empty CO2 tank. Monitor and keep pressure on CO2 tank above 200 psi. All work on pad on hold until problem is remedied.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
02/08/2012	**24 hr Summary** Offloaded CO2 onto truck. Depressurized tank. Repaired tank. Started filling CO2 tankw/N2 for PT Built Hootch over CO2 tank to keep warm. Expro cont'd rig up. Electrician trouble shooting generator.									
	00:00	12:00	12.00			SURPRI	FLOWT	OTHR	P	0300 Air Liquide CO2 truck arrived on location. Off load CO2 from tank to truck. Depressurize CO2 storage tank. Inspected tank in area of leak and found 1 1/2" nipple not screwed into coupling tight enough and nipple was broken in the thread section. Chased threads on collar, replaced 1 1/2' nipple, secured all fittings with proper torque.
	12:00	00:00	12.00			SURPRI	FLOWT	RURD	P	Re-start circulating Glycol, warming up wellbore. Start filling CO2 tank with N2 for pressure test. Sent CO2 truck to KIC shop to warm up. Built a hootch over the CO2 tank and applied heat to keep tank temp above 0 °F. Expro continued rig up. Electrician trouble shooting generator problem. Rig up prep for Coil Tubing.
02/09/2012	Continue warming well bore. Plumb GC unit. Terminate the electrical on the GC unit. Continue to trouble shoot the Primary Generator.									
	00:00	12:00	12.00			SURPRI	FLOWT	OTHR	P	Continue pumping glycol warm the well bore. Plumb in the GC unit and terminate the electrical.
	12:00	00:00	12.00			SURPRI	FLOWT	OTHR	P	Precision Power (Peak) continue to trouble shoot the Primary Generator. Expro continue rigging up for flowback. 12:00 Reversed Glycol flow to down the annulus and return up the Flat pack. Shut down heating of well bore, temps were over 40°F thru-out the annulus.
02/10/2012	Inspect CO2 Tank. Trouble shoot Generator. CT clean out of well bore. CT lost gear box. Start repair.									
	00:00	07:00	7.00			SURPRI	FLOWT	RURD	P	MIRU, PJSM WITH SLB N2 PUMPERS, LRS, CTS, WELL ENGINEER, WELL SITE SUPERVISOR. COMPLETE RIGGING UP CT, LRS, N2 UNIT AND GMS SKID. PRE- JOB ON PT. PT HARDLINE AND LUBRICATOR WITH LRS TO 350/4000 PSI. PT N2 LINES AND GMS UNIT WITH N2 TO 500/3800 PSI.
	07:00	09:00	2.00			SURPRI	FLOWT	OTHR	P	DISPLACE CT WITH 30 BBLS, 104 DEGREE SEAWATER. MU SOL ONLINE FOR 8 BBLS 1.1 BPM CIRC PRESS = 3000 PSI.
	09:00	09:30	0.50			SURPRI	FLOWT	OTHR	P	OPEN WELL. ZERO AT TBG HANGER, PUH TO BUMP AT STRIPPER. RIH PUMPING AT 1 BPM. CIRC PRESS = 2750 PSI. MU-SOL AT NOZZLE AT 2000 FEET.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	09:30	10:15	0.75			SURPRI	FLOWT	OTHR	P	INCREASE RATE TO 1.2 BPM PUH AT 60 FT/MIN TAG STRIPPER.
	10:15	11:00	0.75			SURPRI	FLOWT	OTHR	P	ONLINE WITH SEA WATER RIH TO 2039' CTMD COLD WATER ONLINE AT 140.7 MM TOT. CIRC PRESS = 3850 PSI. WAIT AT 2039' FOR COLD WATER TO EXIT NOZZLE.
	11:00	11:30	0.50			SURPRI	FLOWT	OTHR	P	RIH TO 2139' AT 30 FPM PER K.L.M. WAIT AND MONITOR TEMPERATURES.
	11:30	11:45	0.25			SURPRI	FLOWT	OTHR	P	DECREASE RATE TO .8 BPM CIRC PRESS = 2037 PSI. DECREASE RATE TO .5 BPM. CIRC PRESS = 1116 PSI.
	11:45	12:45	1.00			SURPRI	FLOWT	OTHR	P	LINE UP SLB N2 DOWN THE CT TAKING RETURNS UP THE CT ANN. AT 350 SCF. RIH AT 30 FPM. TAG AT 2353.6' PUH 10 FEET AND WAIT ON N2 TO EXIT NOZZLE. PUH DISPLACING H2O FROM TBG AT 35 FPM.
	12:45	14:15	1.50			SURPRI	FLOWT	OTHR	T	LOST ALL HYDRAULIC PRESSURE TO UNIT.CLOSED PIPE RAMS. AND MANUALLY LOCKED. INCREASED N2 TO 1500 SCF BLOW DOWN CT AND CT ANNULUS.MECHANIC ON LOCATION. DIANOSED PROBLEM UNIT SHUT DOWN PENDING REPAIRS.
	14:15	00:00	9.75			SURPRI	FLOWT	OTHR	T	Expro continue rig up 90% complete. SLB work on GC w/Keith. Prec. Power trouble shoot Generator. Alaska State Boiler & Vessel Inspector on location and inspected SLB's CO2 Tank with no problems.
02/11/2012	Finished repairs on gearbox of Coil Tubing Unit. Completed wellbore clean out. Purge coil tubing with Nitrogen. Displace 4 1/2" tubing w/traced N2: CO2 blend.									
	00:00	05:00	5.00			SURPRI	FLOWT	RURD	T	Precision Power Electrician waiting on Cummins Technician and parts to repair Primary Generator. SLB repair software delay. Practice, set up for testing. flowed mixed gas out Bruce valve w/tracer, tested with GC. Opened CO2 tank to make sure lines are clear. Expro and Scaffolding crew constructed Hootch over end of Atigun Building. Waiting on crane for setting up flare and adjusting upright tanks. Will share crane with perforators.
	05:00	08:30	3.50			SURPRI	FLOWT	OTHR	T	WAIT FOR MECHANICS TO COMPLETE REPAIRS TO UNIT.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	08:30	09:00	0.50			SURPRI	FLOWT	OTHR	P	PJSM AND OPS MEETING, FUNCTION OPEN BOPE, OPEN CHOKE. PUH , RIH ADJUSTING RIH SPEEDS TO FUNCTION CHECK HYDRAULICS. N2 PUMP COOLING DOWN. RIH TAG PO BUSHING CORRECT DEPTH TO 2371'. PUH TO 2361'
	09:00	09:45	0.75			SURPRI	FLOWT	OTHR	P	PT N2 PUMP TO 500/4000 POUNDS. ONLINE N2 DOWN CT AT 500 SCF. INCREASE RATE TO 1500 SCF.
	09:45	10:45	1.00			SURPRI	FLOWT	OTHR	P	WHP = 150 PSI PUH AT 15 FT/MIN. CIRC PRESS = 1475 PSI. PARK CT AT 1994' CIRCULATE N2 DOWN THE CT AND UP THE CT ANN.
	10:45	12:00	1.25			SURPRI	FLOWT	OTHR	P	SHUT DOWN N2, LINE UP TO REVERSE CIRC DOWN THE CT ANN AND UP THE CT. RIH TAG AT 2371' REVERSE CIRCULATE. WATER AT SURFACE H/L AT TANKS FREEZING HOOKED UP HEATERS HAD METH. DELIVERED. SLIPSTREAM DOWN STREAM OF CHOKE .
	12:00	14:30	2.50			SURPRI	FLOWT	OTHR	P	POOH TO SURFACE BLEEDING DOWN WELLHEAD AND CT. H/L CONTINUING TO FREEZE OFF. WORK TO BLEED DOWN. CT FROZEN.
	14:30	16:30	2.00			SURPRI	FLOWT	OTHR	P	PUMP 1 BBL MEOH TO CT. COOL DOWN N2 PUMPERS ONLINE WITH N2 CIRC PRESS = 200 PSI INITIAL. PRESS INCREASED TO 2200 PSI. PRESS BROKE OVER TO 1000 PSI. PRESS. INCREASED TO 2100 PSI BROKE OVER TO 1400 PSI. PRESSURE INCREASED TO 2400 PSI.
	16:30	17:45	1.25			SURPRI	FLOWT	OTHR	P	PRESS. BROKE OVER. GETTING N2 BACK AT TANKS.
	17:45	18:15	0.50			SURPRI	FLOWT	OTHR	P	PURGE CT. 750 SCF INCREASE RATE TO 1000 SCF
	18:15	19:00	0.75			SURPRI	FLOWT	OTHR	P	CONTINUE PURGING CT CIRC = 1230 PSI. SHUT DOWN N2 FOR PRE JOB
	19:00	19:45	0.75			SURPRI	FLOWT	SFTY	P	PJSM TO PUMP N2/CO2 BLEND. ON LINE N2 DOWN THE CT AT MIN RATE RIH TAG AT 2364' PU TO 2360'
	19:45	20:15	0.50			SURPRI	FLOWT	OTHR	P	ONLINE WITH N2/CO2 DOWN THE COIL WHP = 500 PSI. DHP AT 2292' MD = 555 PSI. RATE = 220 KG/HR
	20:15	20:45	0.50			SURPRI	FLOWT	OTHR	P	WHP = 540 PSI, DHP = 560 PSI, RATE = 220 KG/HR TRACER GAS STILL MONITORING LOW.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	20:45	21:15	0.50			SURPRI	FLOWT	PULL	P	POOH AT 75 FPM RATE = 220 KG/HR, BHP = 565 PSI, WHP = 540 PSI.
	21:15	22:15	1.00			SURPRI	FLOWT	OTHR	P	ON SURFACE CLOSE IN CHOKE. INCREASE WHP TO 600 PSI. SHUT IN SWAB. ONLINE WITH N2 DOWN THE CT.
	22:15	00:00	1.75			SURPRI	FLOWT	RURD	P	RDMO LOCATION STAGE ON PAD
02/12/2012	MIRU E-line and crane. Run tie-in Log & Map cables. Adjust BHP. MU Perforating assy. RIH and Tie-in Perforate.									
	00:00	04:00	4.00			SURPRI	FLOWT	RURD	P	SLB. Bled down CO2 and N2 tanks. Found and repaired leak in the Tracer line. Continued rig up of hoses for Heater string for the upright tanks. BHP = 625 psi.
	04:00	08:30	4.50			SURPRI	FLOWT	SFTY	P	Depart Deadhorse WL shop to Gun Shop and secure 2 ea. 30' guns.Travel to Ignik Sikumi.Arrive on location and obtain clearance to access Ignik Sikumi Pad. Meet SPOC. Tailgate PJSMN and wait on final ramoval of coil tubing set-up equipment. Spot up e-line unit and spot-up third party crane.
	08:30	13:30	5.00			SURPRI	FLOWT	PULD	P	Make up lubricator; test lift to confirm crane and grease hoses will reach. Finish picking up pressure equipment. Make up tools (completion mapper, WPPT and Gyrodata gyro tool) and perform tool checks. Move to well. Stab on well and line up for pressure testing using field triplex and diesel. PT 500-psi low; 1400-psi high.
	13:30	15:00	1.50			SURPRI	FLOWT		P	Bleed/blow down. Break off stack at quick connect. Stab off at quick connect and pump out all excess PT fluid below pump in sub and above swab valve.
	15:00	22:30	7.50			SURPRI	FLOWT		P	Open well and RIH WPPT with gyro. Performed completion mapping to 2350' using completion mapper with WPPT and Gyrodata tools. Determined clockwise tool spin (both RIH & PUH) at one full rotation per approximately 210' travelled or 1.7-deg/ft. Confirmed good signature from metal blast protectors on cable outside tubing, but rotation change from centralizer drift requires additional interpretation/investigation.
	22:30	00:00	1.50			SURPRI	FLOWT		P	POOH and rig back for night.
02/13/2012	Continued completion mapping logging to confirm toolface orientation for Perforating.									

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	00:00	12:00	12.00			SURPRI	EVALWE	ELOG	P	Continue completion mapping logging to confirm toolface orientation for perforating.
	12:00	00:00	12.00			SURPRI	FLOWT	PULD	P	Change out AES crane and replaced w/Peak crane for possible 24 hr coverage. Used AES crane for setting up flare stack and putting steps on upright tanks. Set up containment around truck loading area.
02/14/2012	Added 30' section to crane to lubricate long perforating tool string. Replaced primary well site generator control module and started same. Pressure tested SLB GMS to 2000 psi and loaded tubing with traced 77% N2 : 23%CO2 to 1400 psi.									
	00:00	12:00	12.00			SURPRI	FLOWT	OTHR	P	Changed out at F-wing and drove to location. Peak crane crew added a 30' extension section of lattice.
	12:00	00:00	12.00			SURPRI	FLOWT	OTHR	T	Peak Precision Power on site with Cummins mechanic to change out the engine control module of the primary well site generator. Generator successfully started and allowed to run. 20:40 SLB E-line arrived on location, performed safety / SimOps meeting. E-line crew MIRU and surface tested tools. 21:00 performed pre job safety and SimOps meeting with SLB wells services crew. Pressure tested SLB GMS and treating iron to the wing valve to 2020 psi. Walked pressure up to 1100 psi shut down and walked treating lines. Pressured up GMS and treating iron to wing valve to 2020 psi and shut in. Test good. Bled tubing to 1000 psi. 21:30 lined up to the tubing and began to load well with mixture of traced 77% N2 : 23%CO2. 22:37 slowed rate to 200 kg/ hr @ 1403 psi. 22:45 down on the pump T = 1425 psi.
02/15/2012	Perforated 2243'-2273' with 2.88" PJ Omega gun loaded 2 SPF 0/180 phased. Shots oriented 90 deg from blast protectors. Established injection of SF6 traced gas mixture 77% N2:23%CO2 into zone.									
	00:00	00:30	0.50			SURPRI	PERF	PERF	P	E-line PT'd lubricator to 3000 psi
	00:30	02:30	2.00			SURPRI	PERF	PERF	P	Bled and drained lubricator. Re shot through tools to confirm communication. Pick up perf guns. Perforating charges 2- 7/8" OD Power Jet Omega, 2906, 0&180 phase, 2 spf.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	02:30	05:00	2.50			SURPRI	PERF	PERF	P	RIH tied in and oriented guns in preparation to fire. Encountered electrical issue with GMS unit. N2 soft start relay is tripping. Replacement parts located and Peak electrician dispatched from Deadhorse.
	05:00	08:00	3.00			SURPRI	PERF	PERF	T	Wait on electrician. 0700 electrician on pad with replacement parts. 0755 Soft start repaired pumps back on line.
	08:00	08:30	0.50			SURPRI	PERF	PERF	P	0803 Come on line with SF6 traced N2:CO2 blend venting out the Bruce valve 2" valve closed to well. Tubing pressure 1342 psi at the second gauge. 0815 fired guns, indication of fire noted. CCL to top shot 25.8' CCL stop depth 2217.2' Shot 2243-2273' with 2.88" PJ Omega gun loaded 2 SPF 0/180 phased. Shots oriented 90 deg from blast protectors. Open 2" to well close Bruce valve. E-Line pulling out of hole.
	08:30	08:45	0.25			SURPRI	CHEMTI	OTHR	P	Down on pumps. Shut in pressure 1390 psi. 2" valved closed.
	08:45	09:45	1.00			SURPRI	CHEMTI	OPNW	P	Observe pressure fall off to 1351 adn 43 F at gauge #2. WHP 1110 psi. SLB E-line rigged off the well. All shots fired. Released crew.
	09:45	10:45	1.00			SURPRI	CHEMTI	OPNW	P	Start pumping 1354 psi and 43 F, mass flow 200 Kg/Hr (1 Kg/hr is approx 710 SCF/day). Shut down pumps at 1552 psi and 43 F at second gauge. Monitor pressure and temp @ 10:45 1507 psi and 42F.
	10:45	11:15	0.50			SURPRI	CHEMTI	OTHR	P	Start pumping at 200 kg/hr with 2" open. At 1598 psi stop pumping 2" closed.
	11:15	14:00	2.75			SURPRI	CHEMTI	OTHR	P	Monitor pressure fall off to 1391 psi
	14:00	16:00	2.00			SURPRI	CHEMTI	OTHR	P	start pumping at 50 Kg/hr 1383 psi at gauge # 2. Gauge #2 pressure slowly increasing to 1417 psi. at 20:00
	16:00	00:00	8.00			SURPRI	CHEMTI	OTHR	P	Continue to inject mixed traced gas reducing rate to maintain 1420 psi at gauge #2
02/16/2012	Set sand screen and loaded Nitrogen storage tank # 2 with 1900 gal product. Started primary wellsite generator and switched to same.									
	00:00	05:30	5.50			SURPRI	CHEMTI	OTHR	P	Pumping traced, mixed N2:CO2 into formation.
	05:30	07:00	1.50			SURPRI	CHEMTI	OTHR	P	SLB / Expro morning Safety / Ops meeting and Morning call in

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	07:00	10:30	3.50			SURPRI	CHEMTF	OTHR	P	Slickline on location with sand screen assembly. Hold pre job with crew and third party crane operator. Walk down well head, SLB & Expro equipment with HES slickline crew. Valve crew on location, service swab and injection side wing. Slickline assembling lubricator and screen.
	10:30	11:30	1.00			SURPRI	CHEMTF	OTHR	P	Problem Wells Supervisor on location to inspect location and prep for Alaska Oil and Gas Commission witnessed Mechanical integrity test of the Inner annulus. Walked down side and discussed procedure.
	11:30	13:30	2.00			SURPRI	CHEMTF	OTHR	P	Continue to pump traced, mixed N2:CO2 into formation. Start to lift lubricator. Shut down pick due to excessive flex in lubricator. Discuss plan forward. SL crew to source additional 5.5" lubricator.
	13:30	15:30	2.00			SURPRI	CHEMTF	OTHR	P	Shut down GMS @ 13:16 to swap to primary well site generator and install updated GMS software.
	15:30	16:30	1.00			SURPRI	CHEMTF	OTHR	P	Primary well site generator on line. GMS well bore heater string circulation back on line 15:01. GMS cryogenic pumps cooled down, pressure up, and operating 15:15. HES Nitrogen tanker on location 16:00. Off loaded 1900 gal liquid N2 into Nitrogen tank # 2.
	16:30	17:30	1.00			SURPRI	CHEMTF	OTHR	P	Picked up SL lubricator and rigged up to the well. Shut in upper master and opened the swab. Pressure tested the lubricator with traced mixed N2:CO2 to 1400 psi. Bled lubricator to 1240 and opened up to well. Drift and tag with 3.60" gauge ring. Tagged at 2371' POOH. Shut swab and bled off lubricator to bleed tank. Lubricator plus surface equipment is 22' of 41/2 (ID 3.958") and 60' of 5 1/2 (ID 5.00"). Pumping traced mixed N2:CO2 to formation at 20 kg/hr.
	17:30	19:30	2.00			SURPRI	CHEMTF	OTHR	P	Out of hole, lay down lubricator, make up sand screen, OL 56' 8.5", load in lubricator. Third party crane crew changed out from day to night operator.
	19:30	21:30	2.00			SURPRI	CHEMTF	OTHR	P	19:15 picking lubricator with sand screen. Pressure tested lubricator to 1310 psi with traced, mixed N2:CO2. 20:06 RIH, set down, hand spang sand screen into seal assembly, pull to establish latch, sheared off 20:38. POOH. 21:07 slickline off the well and rigging down surface equipment.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	21:30	02:30	5.00			SURPRI	CHEMTI	OTHR	P	Continue pumping traced, mixed N2:CO2 into formation @ 1410 psi middle down hole gauge and 20 Kg/ hr.
02/17/2012	Continued pumping traced mixed gas (77% N2:23%CO2) at 17-24 kg/hr to maintain 1420 psi on XPIO gauge @ 2226' MD. Performed Mechanical Integrity Test of the Inner Annulus (MITIA) - failed. Suspect thermal contraction of fluid not a leak. - ongoing									
	00:00	02:30	2.50			SURPRI	CHEMTI	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at 18 Kg/hr 1410 psi on XPIO gauge @ 2226' MD
	02:30	06:00	3.50			SURPRI	CHEMTI	OTHR	P	Bled gas from top of N2 pump. Pumping traced mixed gas (77% N2:23%CO2) at 18 Kg/hr 1411 psi on XPIO gauge @ 2226' MD.
	06:00	09:00	3.00			SURPRI	CHEMTI	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at 18 Kg/hr 1412 psi on XPIO gauge @ 2226' MD. Increased pump rate to 21 KG/hr to hit target bottom hole pressure of 1420 psi at 0900.
	09:00	09:30	0.50			SURPRI	CHEMTI	OTHR	P	Walking up pressure to 1420 psi max. Pumping traced mixed gas (77% N2:23%CO2) at 23 Kg/hr 1415 psi on XPIO gauge @ 2226' MD.
	09:30	10:00	0.50			SURPRI	CHEMTI	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at 23 Kg/hr 1418 psi on XPIO gauge @ 2226' MD.
	10:00	10:30	0.50			SURPRI	CHEMTI	OTHR	P	Slow rate to 22 Kg/hr. Pumping traced mixed gas (77% N2:23%CO2) at 22 Kg/hr 1420 psi on XPIO gauge @ 2226' MD.
	10:30	11:30	1.00			SURPRI	CHEMTI	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at 20 Kg/hr 1421 psi on XPIO gauge @ 2226' MD. Reduce rate to 19 Kg/hr to maintain pressure at 1420.
	11:30	14:30	3.00			SURPRI	CHEMTI	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at 19 Kg/hr 1420 psi on XPIO gauge @ 2226' MD. 1421 psi @ 14:45. Reduce rate to 18 Kg/hr to maintain pressure at 1420.
	14:30	17:30	3.00			SURPRI	CHEMTI	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at 17 Kg/hr 1420 psi on XPIO gauge @ 2226' MD. 1421 psi @ 14:45. Pre job for MITIA at 17:10. Open swab to monitor Tubing pressure for MITIA. Tubing pressure at middle gauge dropped to 1418 then 1415 psi. Increased rate to 24 kg/hr to raise tubing pressure.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	17:30	18:30	1.00			SURPRI	CHEMTF	OTHR	P	Performed pre witnessed MITIA - failed. Shut down glycol circulating pump. Double blocked returns to the 125 bbl glycol open top tank at the wellhead. Begin o pressure up IA. Mechanical gauge on IA companion valve not reading correctly. Decision made to continue test with GMS pressure gauge. Pressured the IA up to 1919 psi and blocked in at the pump. Pressure dropped 145 psi in the first 15 minutes and 98 psi in the second 15 minutes for a total of 243 psi. Max pressure loss may not exceed 10% in 30 minutes or 5% in the first 15 minutes. Will reatempt the test in the morning with new gauges.
	18:30	00:00	5.50			SURPRI	CHEMTF	OTHR	P	Continue pumping traced mixed gas (77% N2:23%CO2) at 16 Kg/hr 1420 psi on XPIO gauge @ 2226' MD.
02/18/2012	Continued pumping traced mixed gas (77% N2:23%CO2) at approx 20 kg/hr to maintain 1420 psi on XPIO gauge @ 2226' MD. Performed Mechanical Integrity Test of the Inner Annulus (MITIA) - Passed. Had to shut down GMS du to poor pump control. Adjusted the proportion portion of the Proportion, Integral, Derivative (PID) controller. Gas mixing / pumping issues solved.									
	00:00	05:00	5.00			SURPRI	CHEMTF	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at 17 kg/hr and 1415 psi on XPIO gauge @ 2226' MD.
	05:00	10:00	5.00			SURPRI	CHEMTF	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at 20 kg/hr and 1419 psi on XPIO gauge @ 2226' MD.
	10:00	15:30	5.50			SURPRI	CHEMTF	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at 19 kg/hr and 1420 psi on XPIO gauge @ 2226' MD. Starting to pump rougher.
	15:30	16:00	0.50			SURPRI	CHEMTF	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at 19 kg/hr and 1420 psi on XPIO gauge @ 2226' MD. Discussing shutting down to condition tanks when well site generator accidentally taken off line. Down on the cryogenic pumps. Secondary generator started in 2 minutes and transferred power. Conditioned tanks (N2 and CO2) Transferred liquid N2 from storage tank to working tank and ordered out N2.
	16:00	16:30	0.50			SURPRI	CHEMTF	OTHR	P	Start pumping mixed gas. Fighting the pumps unable to mix the product on spec. Shut down cryogenic pumps.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	16:30	18:00	1.50			SURPRI	CHEMTF	OTHR	P	Conditioning tanks and priming pumps in attempt to bring pumps back on line with in spec blend.Started heating well and started pumping traced mixed gas (77% N2:23%CO2) at 15 kg/hr and 1379 psi on XPIO gauge @ 2226' MD.
	18:00	19:30	1.50			SURPRI	CHEMTF	OTHR	P	Increased rate to 25 kg/hr pressure 1391 at on XPIO gauge @ 2226' MD. Nitrogen transport arrived on location. Need to fill both tanks. Shut down N2 pumping and closed 2" to well. stopped circulation of the IA in preparation for MITIA.
	19:30	20:30	1.00			SURPRI	CHEMTF	OTHR	P	While transferring N2, perform MITIA - Passed. Pre T/I/O=1200/0/NA. Pumped up IA to 1900 lbs and double blocked in at well head. Initial T/I/O = 1200/1900/NA, 15 min 1200/1800/NA, aborted test. Repressure to 1900 psi. Initial T/I/O = 1200/1950/NA, 15 minute T/I/O = 1200/1870/NA, 30 minute T/I/O = 1200/1795/NA. Total loss of 155 psi
	20:30	21:30	1.00			SURPRI	CHEMTF	OTHR	P	Restart circulating heated glycol through the inner annulus and restart injecting traced mixed gas (77% N2:23%CO2) at 100- 75 kg/hr and 1347 psi on XPIO gauge @ 2226' MD.
	21:30	00:00	2.50			SURPRI	CHEMTF	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at 30-20 kg/hr and 1420 psi on XPIO gauge @ 2226' MD. Starting to pump very rough again. Large spikes in the N2 and CO2 rates. GC samples indicate N2 concentrations are high at ~81%.
	00:00	00:30	0.50			SURPRI	CHEMTF	OTHR	P	Adjust GMS blend setting to 72% N2 : 28% CO to achieve 77% : 23% respectively on GC results.
	00:30	01:00	0.50			SURPRI	CHEMTF	OTHR	P	Continue to fight blending issues. Discuss options. Investigation of pump rate charts suggest that the N2 pump is leading the CO2 pump. As the CO2 pump falls behind the N2 pump drops off to zero output followed by the CO2 dropping to zero creating a saw tooth pattern. Wake up Optimation operator and discuss problem. P in PID changed from 0.25 to 0.01. Rate instantly stabilizes.
	01:00	01:30	0.50			SURPRI	CHEMTF	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at 20 kg/hr and 1420 psi on XPIO gauge @ 2226' MD. Rate response is very smooth with the noise at approx +- 5kg/hr.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
02/19/2012	**24 hr Summary** Continued pumping traced mixed gas (77% N2:23%CO2) to maintain 1420 psi on XPIO gauge @ 2226' MD. Performed Mechanical Integrity Test of the Inner Annulus (MITIA) - inconclusive. Continue to pump. All Expro less three put on standby and left the slope. Scheduled to return Feb 29 th for initiation of flow back.									
	00:00	08:15	8.25			SURPRI	CHEMTF	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at 18-20 kg/hr and 1418-1420 psi on XPIO gauge @ 2226' MD.
	08:15	08:30	0.25			SURPRI	CHEMTF	OTHR	P	Shut down glycol pumping. Casing and 2" valves to 125 bbl tank shut in.
	08:30	09:00	0.50			SURPRI	CHEMTF	OTHR	P	Tubing pressure fell from 1420 to 1412 psi because of thermal contraction. Increased rate to maintain pressure.
	09:00	10:00	1.00			SURPRI	CHEMTF	OTHR	P	Increased rate to maintain pressure at 1420 psi on XPIO gauge @ 2226' MD.
	10:00	11:00	1.00			SURPRI	CHEMTF	OTHR	P	Perform AOGCC witnessed MITIA with Chuck Scheve. Passed with regard to total pressure loss but failed to stabilize. State man recorded a Fail Pre T/I/O=1268/0/NA. Pumped up IA to 1910 lbs and double blocked in at well head. Initial T/I/O = 1269/1910/NA, 15 min 1265/1828/NA, 30 min T/I/O = 1264/1770/NA, 45 minute T/I/O = 121264/1716/NA, Total loss of 140 psi in 30 minutes however pressure drop was nearly linear. Bled IA and resumed well bore heating.
	11:00	12:00	1.00			SURPRI	CHEMTF	OTHR	P	Reduced pump rate to 15 kg/hr. Tubing pressure rising because of thermal expansion. decreased rate to maintain pressure. Pumps erratic.
	12:00	13:00	1.00			SURPRI	CHEMTF	OTHR	P	S/D pumps, heat well bore, condition tanks.
	13:00	14:30	1.50			SURPRI	CHEMTF	OTHR	P	Bring pumps online at 28 kg/hr and 1409 psi. Adjust rate to achieve 1420 psi. Control screen turned full green. manually shutdown pumps. Screen reverted to normal.
	14:30	16:30	2.00			SURPRI	CHEMTF	OTHR	P	Transfer liquid N2 from storage tank to working tank. Cool down pumps. start pumping at 44 kg/hr and 1375 psi.
	16:30	18:30	2.00			SURPRI	CHEMTF	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at 44-22 kg/hr and 1420 psi on XPIO gauge @ 2226' MD.
	18:30	19:00	0.50			SURPRI	CHEMTF	OTHR	P	HES N2 transport on location.
	19:00	19:30	0.50			SURPRI	CHEMTF	OTHR	P	N2 transport contained 2040 gal. Off loaded and left with 7.5" or 534 gal on board. Off loaded 1506 gal into N2 storage tank.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	19:30	22:00	2.50			SURPRI	CHEMTF	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at 20 kg/hr and 1420 psi on XPIO gauge @ 2226' MD.
	22:00	00:00	2.00			SURPRI	CHEMTF	OTHR	P	Continue pumping traced mixed gas (77% N2:23%CO2) to maintain 1420 psi on XPIO gauge @ 2226' MD.
02/20/2012	Instituted proactive shut down to transfer fluids and condition tanks. Pumps running extremely well under new SOP. N2 pump appears to gas out and loose prime after approximately 8hrs continuous pumping. Initiation of event was anticipated today and successfully mitigated by bleeding gas from the top of the pump chamber. Pumped approx 10.2 MSCF product by 6 pm 77.2 MSCF total. Contacted Jim Regg - AOGCC regarding failed MITIA. Permission to continue injection granted. AOGCC requires a report of operations (pressures and rates) to confirm integrity of IA.									
	00:00	00:15	0.25			SURPRI	CHEMTF	OTHR	P	Experienced a short upset while pumping. Bled the back side of the N2 pumps slowly nad let the GMS PID controlers pump through the upset.
	00:15	04:45	4.50			SURPRI	CHEMTF	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at ~21 kg/hr and 1420 psi on XPIO gauge @ 2226' MD.
	04:45	05:30	0.75			SURPRI	CHEMTF	OTHR	P	Shut down pumping to condition N2 tanks & transfer N2. Greased N2 and CO2 pumps. Transfered 160 gal N2 from storage to working. 1730 gal remaining in storage.
	05:30	16:30	11.00			SURPRI	CHEMTF	OTHR	P	Bring pumps back on line at 1395. Increase rate to 51 kg/hr to reach target of 1420 psi. Pumping traced mixed gas (77% N2:23%CO2) at ~20 kg/hr and 1420 psi on XPIO gauge @ 2226' MD.
	16:30	17:30	1.00			SURPRI	CHEMTF	OTHR	P	Shut down pumping to condition N2 tanks & transfer N2. Transferred 101 gal N2 from storage to working. 1629 gal remaining in storage. Cool down pumps. Restart pumps
	17:30	00:00	6.50			SURPRI	CHEMTF	OTHR	P	Bring pumps back on line at 1395. Increase rate to reach target of 1420 psi. Pumping traced mixed gas (77% N2:23%CO2) at ~20 kg/hr and 1420 psi on XPIO gauge @ 2226' MD.
02/21/2012	N2 pump still appears to gas out and loose prime after approximately 8hrs continuous pumping. Initiation of event was anticipated again today @ apporx 1330. Pumping continued for a few hrs after the event. Shut down and conditioned tanks to mitigate. Pumped approx 12.2 MSCF product by 7 pm for a total of 92 MSCF. Injection rate has increased slowly today from 22 kg/hr to 25 kg/hr									
	00:00	01:15	1.25			SURPRI	CHEMTF	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at 22 kg/hr and 1420 psi on XPIO gauge @ 2226' MD.
	01:15	01:30	0.25			SURPRI	CHEMTF	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at ~22 kg/hr and 1420 psi on XPIO gauge @ 2226' MD. Forced to bleed off the back side of the pump, fighting the N2 pump.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	01:30	04:30	3.00			SURPRI	CHEMTI	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at 22-24 kg/hr and 1420 psi on XPIO gauge @ 2226' MD.
	04:30	05:00	0.50			SURPRI	CHEMTI	OTHR	P	Shut down pumping to condition N2 tanks & transfer N2. Transferred 238 gal N2 from storage to working. 1500 gal remaining in storage.
	05:00	06:15	1.25			SURPRI	CHEMTI	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at 1420 psi on XPIO gauge @ 2226' MD.
	06:15	07:00	0.75			SURPRI	CHEMTI	OTHR	P	GMS lost communication to the well site data hub. Optimation crew worked with SLB Interact support to reestablish communication.
	07:00	13:00	6.00			SURPRI	CHEMTI	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at 25 kg/hr and 1420 psi on XPIO gauge @ 2226' MD. Removed Tioga heater from CO2 tank @ 09:08
	13:00	14:00	1.00			SURPRI	CHEMTI	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at 1420 psi on XPIO gauge @ 2226' MD. Forced to bleed off the back side of the pump, fighting the N2 pump.
	14:00	15:30	1.50			SURPRI	CHEMTI	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at 25 kg/hr and 1420 psi on XPIO gauge @ 2226' MD. Removed Tioga heater from CO2 tank @ 09:08
	15:30	16:30	1.00			SURPRI	CHEMTI	OTHR	P	Shut down pumping to condition N2 tanks & transfer N2. Added 20 bbls of potable water to glycol tank to compensate for evaporation. 125 bbl tank level 70 bbls.
	16:30	00:00	7.50			SURPRI	CHEMTI	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at 28 kg/hr and 1420 psi on XPIO gauge @ 2226' MD.
02/22/2012	Pumping traced mixed gas (77% N2:23%CO2) at 24-26 kg/hr and 1420 psi on XPIO gauge @ 2226' MD. Replaced SF6 tracer with R-114 tracer. Received 20,000 lbs CO2, transferred on the fly while pumping down hole. Pumped approx 12.9 MSCF product by 20:30 for a total of 109 MSCF. Injection rate today was 24 kg/hr to 26 kg/hr.									
	00:00	05:30	5.50			SURPRI	CHEMTI	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at 24-26 kg/hr and 1420 psi on XPIO gauge @ 2226' MD.
	05:30	05:45	0.25			SURPRI	CHEMTI	OTHR	P	Forced to bleed off the back side of the pump, fighting the N2 pump.
	05:45	06:00	0.25			SURPRI	CHEMTI	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at 24-26 kg/hr and 1420 psi on XPIO gauge @ 2226' MD.
	06:00	06:15	0.25			SURPRI	CHEMTI	OTHR	P	Forced to bleed off the back side of the pump, fighting the N2 pump.
	06:15	08:30	2.25			SURPRI	CHEMTI	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at ~ 25 kg/hr and 1420 psi on XPIO gauge @ 2226' MD.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	08:30	09:15	0.75			SURPRI	CHEMTI	OTHR	P	Shut down pumping to condition N2 tanks & transfer N2. Purged ISCO tracer pump of SF6 Tracer. Replaced SF6 tracer bottle with R-114 tracer. Flushed ISCO pump with R-114 tracer. Loaded both colunms A and B to 103 ml each. Set pump rate at 0.01 ml/min.
	09:15	18:30	9.25			SURPRI	CHEMTI	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at ~ 25 kg/hr and 1420 psi on XPIO gauge @ 2226' MD. Transport of CO2 on location, Pre job safety meeting, transfer from tanker to working tank on the fly, complete 13:00.
	18:30	19:15	0.75			SURPRI	CHEMTI	OTHR	P	Shut down pumping to condition N2 tanks & transfer N2.
	19:15	00:00	4.75			SURPRI	CHEMTI	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at 24-26 kg/hr and 1420 psi on XPIO gauge @ 2226' MD.
02/23/2012	Pumping traced mixed gas (77% N2:23%CO2) at 24-26 kg/hr and 1420 psi on XPIO gauge @ 2226' MD. Pumped approx 12.4 MSCF product by 19:00 for a total of 124.7 MSCF. Injection rate today was 24 kg/hr to 26 kg/hr.									
	00:00	03:30	3.50			SURPRI	CHEMTI	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at 27-28 kg/hr and 1420 psi on XPIO gauge @ 2226' MD.
	03:30	04:00	0.50			SURPRI	CHEMTI	OTHR	P	Shut down pumping to condition N2 tanks & transfer N2.
	04:00	15:30	11.50			SURPRI	CHEMTI	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at ~26 kg/hr and 1420 psi on XPIO gauge @ 2226' MD.
	15:30	16:15	0.75			SURPRI	CHEMTI	OTHR	P	Shut down pumping to condition N2 tanks & transfer N2.
	16:15	00:00	7.75			SURPRI	CHEMTI	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at ~26 kg/hr and 1420 psi on XPIO gauge @ 2226' MD.
02/24/2012	Pumping traced mixed gas (77% N2:23%CO2) at 29-30 kg/hr and 1420 psi on XPIO gauge @ 2226' MD. Pumped approx 14.5 MSCF product by 20:00 for a total of 143.9 MSCF.									
	00:00	00:30	0.50			SURPRI	CHEMTI	OTHR	P	Shut down pumping to condition N2 tanks & transfer N2.
	00:30	03:30	3.00			SURPRI	CHEMTI	OTHR	P	Pumps Acting Erratically. Pumping traced mixed gas (77% N2:23%CO2) at ~29-30 kg/hr and 1420 psi on XPIO gauge @ 2226' MD.
	03:30	08:00	4.50			SURPRI	CHEMTI	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at ~29-30 kg/hr and 1420 psi on XPIO gauge @ 2226' MD.
	08:00	09:15	1.25			SURPRI	CHEMTI	OTHR	P	Shut down pumping to condition N2 tanks & transfer N2.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	09:15	16:30	7.25			SURPRI	CHEMTI	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at ~29-30 kg/hr and 1420 psi on XPIO gauge @ 2226' MD. Refilled ISCO Pump A with R-114.
	16:30	17:45	1.25			SURPRI	CHEMTI	OTHR	P	Shut down pumping to condition N2 tanks & transfer N2.
	17:45	00:00	6.25			SURPRI	CHEMTI	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at ~29-30 kg/hr and 1420 psi on XPIO gauge @ 2226' MD.
02/25/2012	Pumping traced mixed gas (77% N2:23%CO2) at 31-33 kg/hr and 1420 psi on XPIO gauge @ 2226' MD. Shuttled power from primary well site generator to secondary and back for oil change. Attempted unsuccessfully to update GMS and InterAct software- ongoing. Pumped approx 13.7 MSCF product by 17:00 for a total of 161.3 MSCF.									
	00:00	05:15	5.25			SURPRI	CHEMTI	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at ~31-32 kg/hr and 1420 psi on XPIO gauge @ 2226' MD.
	05:15	05:45	0.50			SURPRI	CHEMTI	OTHR	P	Shut down pumping to condition N2 tanks & transfer N2.
	05:45	08:00	2.25			SURPRI	CHEMTI	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at ~31-32 kg/hr and 1420 psi on XPIO gauge @ 2226' MD.
	08:00	08:07	0.13			SURPRI	CHEMTI	OTHR	P	Shut down pumping briefly to swap power from primary generator to secondary well site generator for scheduled oil change.
	08:07	08:37	0.50			SURPRI	CHEMTI	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at ~32-44 kg/hr and 1420 psi on XPIO gauge @ 2226' MD.
	08:37	08:52	0.25			SURPRI	CHEMTI	OTHR	P	Shut down pumping briefly to swap power from secondary generator to primary well site generator for scheduled oil change.
	08:52	16:59	8.12			SURPRI	CHEMTI	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at ~32-44 kg/hr and 1420 psi on XPIO gauge @ 2226' MD.
	16:59	19:59	3.00			SURPRI	CHEMTI	OTHR	P	Shut down pumping to condition N2 tanks & transfer N2. Installed new software in GMS unit, coordinated changes with SLB Interact. Unable to effect change. Reloaded original software.
	19:59	20:29	0.50			SURPRI	CHEMTI	OTHR	P	Glycol pumps on line. Resume well bore heating. Cool down cryogenic pumps. Bring pumps online.
	20:29	23:02	2.55			SURPRI	CHEMTI	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at 1420 psi on XPIO gauge @ 2226' MD.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	23:02	23:59	0.95			SURPRI	CHEMTF	OTHR	P	Surface Safety valve tripped inadvertenetly. Reset and resumed pumping traced mixed gas (77% N2:23%CO2) at 1420 psi on XPIO gauge @ 2226' MD.
02/26/2012	Pumping traced mixed gas (77% N2:23%CO2) at 31-33 kg/hr and 1420 psi on XPIO gauge @ 2226' MD. Swapped inlet/outlet on heater string with IA. Pumped approx 14.7 MSCF product by 21:00 for a total of 176.0 MSCF.									
	00:00	05:00	5.00			SURPRI	CHEMTF	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at ~33 kg/hr and 1420 psi on XPIO gauge @ 2226' MD.
	05:00	05:30	0.50			SURPRI	CHEMTF	OTHR	P	Shut down pumping to condition N2 tanks & transfer N2.
	05:30	12:30	7.00			SURPRI	CHEMTF	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at ~33 kg/hr and 1420 psi on XPIO gauge @ 2226' MD. Raised SLB line heater from 100 F to 120 F in 10 deg F increments over a 2 hour peroid from 06:45 to 08:45.
	12:30	13:00	0.50			SURPRI	CHEMTF	OTHR	P	Shut down pumping to condition N2 tanks & transfer N2.
	13:00	19:15	6.25			SURPRI	CHEMTF	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at ~33 kg/hr and 1420 psi on XPIO gauge @ 2226' MD.
	19:15	19:45	0.50			SURPRI	CHEMTF	OTHR	P	Swapped inlet/outlet on heater strings while contining mixed gas injection.
	19:45	00:00	4.25			SURPRI	CHEMTF	OTHR	P	Pumping traced mixed gas (77% N2:23%CO2) at ~33 kg/hr and 1420 psi on XPIO gauge @ 2226' MD.
02/27/2012	Pumping traced mixed gas (77% N2:23%CO2) at 33-35 kg/hr and 1420 psi on XPIO gauge @ 2226' MD. Pumped approx 21 MSCF product by 23:00 for a total of 205 MSCF Hall Plot volume.									
	00:00	06:00	6.00			SURPRI			P	Pumping traced mixed gas (77% N2:23%CO2) at ~33 to 34 kg/hr and 1420 psi on XPIO gauge @ 2226' MD.
	06:00	06:30	0.50			SURPRI			P	Shut down pumping to condition N2 tanks & transfer N2.
	06:30	18:30	12.00			SURPRI			P	Pumping traced mixed gas (77% N2:23%CO2) at ~34 to 35 kg/hr and 1420 psi on XPIO gauge @ 2226' MD. Raised SLB line heater to 135 F at 08:00. Raised glycol circ rate to 15 gpm.
	18:30	19:00	0.50			SURPRI			P	Shut down pumping to condition N2 tanks & transfer N2.
	19:00	22:09	3.15			SURPRI	CHEMTF	OTHR		Pumping traced mixed gas (77% N2:23%CO2) at ~35 kg/hr and 1420 psi on XPIO gauge @ 2226' MD. Pumped up both SSV hydralic panels to 4000 psi at 20:00 hrs. Investigating an error that is creating a time delay in the data storge.
	22:09	22:45	0.60			SURPRI	CHEMTF	OTHR		Took the GMS offline and attempted to restart the computer to correct the data latency problem.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	22:45	00:00	1.25			SURPRI	CHEMTI	OTHR		Resumed pumping traced mixed gas (77% N2:23%CO2) at ~35 kg/hr and 1420 psi on XPIO gauge @ 2226' MD. The data latency problem has not been fixed
02/28/2012	Shut in injection, begin pressure fall off. Stand by for weather (currently -44)									
	00:00	02:00	2.00			SURPRI	CHEMTI	OTHR	P	Continued pumping traced mixed gas (77% N2:23%CO2) at ~35 kg/hr and 1420 psi on XPIO gauge @ 2226' MD. The data latency problem has not been fixed and is continuing to worsen
	02:00	04:00	2.00			SURPRI	CHEMTI	OTHR	T	HMI system crashed, injection offline. Optimation troubleshooting and attempt to restart.
	04:00	07:45	3.75			SURPRI	CHEMTI	OTHR	P	Continued pumping traced mixed gas (77% N2:23%CO2) at ~35 kg/hr and 1420 psi on XPIO gauge @ 2226' MD. The data latency problem continuing. Met with project team, decided to halt injection. Minimum injection volume has been met.
	07:45	00:00	16.25			SURPRI	CHEMTI	OTHR	T	Shut-in iinjection, begin pressure falloff. Stand-by for Weather - current temperature (-44 F, -75 F windchill) below minimum.
02/29/2012	Monitor data and standby for weather warming trend. Optimization working on computer/data issues.									
	00:00	05:27	5.45			SURPRI	CHEMTI	OTHR	T	Monitor data and standby during Cold Weather Shut Down (-42)
	05:27	05:57	0.50			SURPRI	CHEMTI	SFTY	P	Morning Pre-Job Safety Meeting with SLB and Expro.
	05:57	17:27	11.50			SURPRI	CHEMTI	OTHR	T	Monitor data and standby during Cold Weather Shut Down
	17:27	17:57	0.50			SURPRI	CHEMTI	SFTY	P	Evening Pre-Job Safety Meeting with SLB and Expro
	17:57	00:00	6.06			SURPRI	CHEMTI	OTHR	T	Monitor data and standby during Cold Weather Shut Down
03/01/2012	Data was monitored and on standby until Cold Weather Shut Down was lifted around 1300hrs.. Began completing Procedure #11 .									
	00:00	13:00	13.00			SURPRI	CHEMTI	OTHR	T	Monitor data and standby during Cold Weather Shut Down (-42). #1 glycol pump was shut down due to bad beaing and/or shaft. Parts on order.
	13:00	00:00	11.00			SURPRI	CHEMTI	PRTS	P	Cold Weather restrictions lifted (-31) and work commenced towrads completing Procedure 11. Expro's hardline and the GC lines were pressure tested successfully. 290 bbls of 140 dgree water was off loaded into uprights. Expro Stack Pac lines were connect3ed and PT'ed and glycol circulated.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
03/02/2012	**24 hr Summary** Finish Procedure #11, specifically validating the gas flow meters and GC as well as setting the back pressure valves on the Expro separator.									
	00:00	13:00	13.00			SURPRI	CHEMTI	PRTS	P	Continue making progress in completing Procedure #11. Finish pressure testing lines, setting the back flow valves on the Expro separator, validate the gas flow meters and GC. Increase glycol pump rate to warm wellbore back up.
	13:00	00:00	11.00			SURPRI	CHEMTI	PRTS	T	Lost Prime on pumps had to recondition Nitrogen tanks and transferr N2. Flow readings on small gas meter match GMS MicroMotion readings. Began testing larger gas meter wirth N2. Large gas meter showing difference of 10 to 7 % from GMS MicroMotion.
03/03/2012	Continue working gas metering issues. Moved meter FM 201 from GMS to gas outlet leg of Expro separator and tie in to automation system.									
	00:00	13:00	13.00			SURPRI	FLOWT	PRDT	T	Continue working gas metering issues.
	13:00	00:00	11.00			SURPRI	FLOWT	PRDT	T	Testing meters with CO2 and still finding offset between thermal conductivity and the MicroMotion in the GMS. While testing still, lost prime and basically emptied the CO2 tank. Had 3,000 gal of N2 delivered and offloaded. Moved MicroMotion meter FM 201 from the GMS to the gas outlet of the Expro separator and tied into the automation system. Began testing with N2 with the new meter in place.
03/04/2012	CompleteTesting of Micro Motion meter rigged up in the Atigun House and evaluate data. Started flowing well back.									
	00:00	06:00	6.00			SURPRI	FLOWT	PRDT	P	Start testing of Micro Motion meter rigged up in Expro Spearator skid. Testing with N2 at four different rates.
	06:00	09:30	3.50			SURPRI	FLOWT	PRDT	P	Finished testing of the four varying rates and added a fifth rate test which is actually a re-test of the lowest rate test performed previously in order to validate/compare data.
	09:30	13:24	3.90			SURPRI	FLOWT	PRDT	P	Finished the re-test of the lowest rate and determined this data was acceptable. Shut down testing and lined the Expro separator up for flow. Optimization person was requested to make several changes in software.
	13:24	13:54	0.50			SURPRI	FLOWT	SFTY	P	Hold Pre-Flow Back Safety Meeting with SLB, Expro, Halliburton hands in the Atigun House.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	13:54	00:00	10.10			SURPRI	FLOWT	PRDT		Open well to commence flow back As of 2005 hrs approximately 4,100 cf of gas has been flowed back.
03/05/2012	Continue with flowback operations and monitor data.									
	00:00	00:00	24.00			SURPRI				Continue with flow back operation. Have flowed back approximately 42mscf gas. BHP started at 1080psi and as of 2030 hrs is around 750psi. Well is loading up. Decision made to start prepping for Procedure #13 ("Jet Pump Running and Pulling) after 2300hrs. Pump truck and tanker with F/W ordered for after midnight. Slickline tentatively scheduled for am start setting jet pump.
03/06/2012	Continue implementing Procedure #13 (Jet Pump Running & Pulling). Flush glycol out of well with N2. After bleeding down N2, pump heated F/W down annulus. Slickline drift & tag, set standing valve, set catcher, pull dummy valve, pull catcher, and run jet pump.									
	00:00	12:00	12.00			SURPRI				Start implementing Procedure #13 (Jet Pump Running & Pulling) by displacing glycol from the IA with N2. Re-rig piping in wellhouse to facilitate this operation. Begin displacing the glycol by taking returns up the hearter string. Bleed down N2 after all gycol out of well.
	12:00	16:30	4.50			SURPRI				MIRU pump truck and tanker loaded with 200bbls F/W. Begin heating F/W to 175 degrees and pump down annulus in order to equlize pressure at the GLM.
	16:30	17:30	1.00			SURPRI				RDMO Pump Truck and tanker.
	17:30	19:00	1.50			SURPRI				MIRU Slickline.
	19:00	19:45	0.75			SURPRI				PJSM with Halliburton Slickline crew and SLB Night Supervisor.
	19:45	00:00	4.25			SURPRI				PT Lubricator to 500psi with N2. Bleed down to 250 psi, open well and RIH. Commence slickline operations as per Procedure #13.
03/07/2012	Finish Procedure #13 by setting jet pump and began Procedure #14 (Jet Pump Operations). Commence flow back to Upright #1 by starting the jet pump. Monitored BHP and took BS&W samples every 30min. BS&W samples started around 8% and as of 2100hrs samples were reading about .9% and at this time the total amount of produced fluids was 42bbls.									
	00:00	01:30	1.50			SURPRI				Finish Procedure #13 by setting the "5-C" Jet Pump @1919' SLM.
	01:30	02:00	0.50			SURPRI				RDMO location with the slickline unit.
	02:00	02:24	0.40			SURPRI				Line up well to flowback through Expro separator and into upright tank #1. Start up jet pump and begin taking returns.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	02:24	03:24	1.00			SURPRI				Begin taking samples for the GKBU Lab and the USGS. Samples were moderately "silty".
	03:24	06:24	3.00			SURPRI				Continue flowing back well and monitoring data. First slug of solids enter separator around 0530hrs. Heavy silt samples taken from separator.
	06:24	20:55	14.52			SURPRI				Continue flowing back into upright #1. Begin taking BS&W samples. First sample was about 8% solids. Subsequent solids were 7%, 5%, 3.5% 2.8%, 1.5%, .5% and eventually went back up around .9% by 2100hrs. Total bbls of fluid produced by 2100hrs is about 42bbls.
	20:55	23:59	3.08			SURPRI				Continue flowing back well, monitoring data, strapping flowback tank and take samples
03/08/2012	Continue Jet Pump operations, monitoring data, and taking BS&W samples.									
	00:00	06:27	6.46			SURPRI				Continue Jet Pump operations.
	06:27	06:46	0.33			SURPRI				Air line to air/hydraulic SSV froze off ca suing the SSV to slowly shut in. Clear air line, open SSV and resume flow back operations. Air line was eventually placed inside heated "blue board troughs" and a second air compressor was installed to allow for the compressors to be shut down and the Tanner Gas air dryer re-filled.
	06:46	07:01	0.25			SURPRI				Flow back was switched to upright #2.
	07:01	23:58	16.96			SURPRI				Continue Jet Pump operations. A snapshot of BS&W samples from midnight up to 2100 hhrs were from .8, 2..6, 1.3, 4.5, 1.2, 2.2, .6. Total bbls of produced fluids to uprights since startup is now at 96.07 as of 2100hrs as well as 98mscf gas. BHP at midnight was 663psi and at 2100 hrs was 659psi.
						SURPRI				
03/09/2012	Normal Jet Pump operations until 11:00am when separator pressure was lost. No gas in fluids. Implementing different options to maintain BHP and re-establish separator pressure.									
	00:00	11:00	11.00			SURPRI			P	Continue flowing back well and monitoring data.
	11:00	11:15	0.25			SURPRI			P	Pressure drops in separator and wellhead. Very little gas coming back with fluids causing the separator to lose charge. Close choke to allow for pressure bulid up.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	11:15	11:30	0.25			SURPRI			P	Open choke to minimum flows. No gas. Adjust Jet Pump rate to ensure Jet Pump operating.
	11:30	13:15	1.75			SURPRI			P	Pump N2 across wellhead to Expro separator to re-charge separator up to 125psi approximately. Switch to upright #1 to facilitate tank strapping (too much agitation causing plumb bob strap to give inaccurate readings).
	13:15	13:30	0.25			SURPRI			P	Shut down N2 pump. Continue flowing back well.
	13:30	14:37	1.12			SURPRI			P	Open choke further by two beans. Wellhead pressure dropped off from around 650psi to as low as 545psi and then started to climb towards 700psi resulting in choking back the well.
	14:37	15:22	0.75			SURPRI			P	Pressure slowly falls back. Continue making adjustments with pump and choke to maintain flow.
	15:22	17:31	2.15			SURPRI			P	Well essentially died and failed to produce fluids. Continue making adjustments to regain flow.
	17:31	18:31	1.00			SURPRI			P	Pump started behaving erratically. It was fluctuating between 4 & 18 gpm.
	18:31	19:01	0.50			SURPRI			P	Shut down pump. Flush lines and remove screen on suction line. Screen and line were clogged with sand. Re-route hoses on uprights tanks to facilitate suction from Tank #1 and flow into Tank #2 in order to allow "settling" of solids.
	19:01	23:59	4.98			SURPRI			P	Restart Jet Pump and establish flow. Continue to monitor data and make adjustments to help retain flow. Start removal of 302 fluid pump in GMS and replace with new pump. As of 2100hrs, well has produced 16mscf and 25bbls of fluid. Snapshot of BS&W samples were 2.0, 1.5, .05, .6, .4, 1.2, .25, .15
03/10/2012	Normal jet pump operations until about 1330hrs when well was shut in so a control valve on separator could be replaced. Resumed flow back operation after valve replacement.									
	00:00	00:45	0.75			SURPRI			P	Continue efforts to keep well flowing. Vac arrives and hauls off 110 bbls of returns for disposal.
	00:45	01:00	0.25			SURPRI			P	Shut down power fluid pump 301 in order to remove 302 pump and install new pump.
	01:00	06:00	5.00			SURPRI			P	Resume jet pump operations.
	06:00	06:15	0.25			SURPRI			P	Shut down pumping in order to re-configure pumps 301 & 302 piping. (This modification will facilitate a quicker pump installation next time)

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	06:15	13:30	7.25			SURPRI			P	Resume jet pump operations. Struggle to get well to previous performance level. Make adjustments to improve flow characteristics.
	13:30	18:36	5.10			SURPRI			P	Liquid level control valve on EXPRO separator washes out. Caught early when only a drip. Well shut in and flowline from wellhead to separator blown down with N2. Work commences on swapping out the washed out valve with a similiar valve already bolted in-line, but not being used. This location was blinded off.
	18:36	00:00	5.41			SURPRI			P	Open well and start Jet Pump operations. As of 2100hrs, in the previous 24hrs the well has produced 81bbls of fluid and 15.5 mscf of gas.
03/11/2012	Finally back to normal jet pump operations. Monitoring data and taking BS&W samples.									
	00:00	02:00	2.00			SURPRI			P	Continuing jet pump operations. Gas ceases to flow before midnight. Lower BHP and well begins to flow again with gas around 2:00am
	02:00	00:00	22.00			SURPRI			P	Continue Jet Pump Operations. The well has a tendency to flow for a period of time then lose gas and go to minimum flow or even cease to flow until pressure builds back. Monitor data and continue to flow well. Some of the BS&W samples ranged from .2%, .5%, 2.0%, 4.0%, 1.4%, .6%, .15%, 1.6%. As of 2100hrs, for the previous 24hr period the well produced 18 bbls of fluid and 12 mscf of gas.
03/12/2012	Continue to lower BHP, monitor data, and take BS&W samples. Troubleshoot GMS HPP issues.									
	00:00	00:00	24.00			SURPRI			P	Currently in Jet Pump operations and bringing down BHP. Haul off 175 bbls returns. Snow removal after blow. Shovel out around the buildings and piping. Troubleshoot pump issues. BS&W samples were running from .6, .22, 1.0, .5, 1.6, 3.2, 2.8, .2, .01, .15 as of 2100 hrs for the last 24 hrs, the gas flowed back is 7.2 mscf and the fluid produced are 25 bbls.
03/13/2012	Continue to lower BHP, monitor data, and take BS&W samples.									

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	00:00	23:30	23.50			SURPRI	FLOWT	PRDT	P	Currently in Jet Pump operations and bringing down BHP. Removed the small backpressure control valve in the Expro low rate metering skid. Controlling rate by holding surface separator pressure as low as possible. BS&W samples continue to range from 0.1 to 3.1% with a daily average of 0.9 and a spike of highest concentrations from 0930-1400 hrs. 10 mscf gas and 50 bbls H2O flowed back over the last 24 hrs as of 2030. Walked down location with CPAI environmental in preparation for ADEC visit tomorrow.
	23:30	00:00	0.50			SURPRI	FLOWT	PRDT	T	A dump valve in the flow back separator line cut out assumedly due to sand production. The well was shut in and efforts to blow down surface lines initiated.
03/14/2012	Washed out the water dump valve in the Expro test Separator. Shut in well, Displaced power fluid, (fresh water) from the inner annulus with 60/40 Tritherm (triethylene glycol) and initiated well bore heating by circulating down the heater string and taking returns from the Inner annulus casing valve. Waiting on replacement water dump valve.									
	00:00	04:00	4.00			SURPRI	FLOWT	PRDT	T	Blow down surface lines that contained power fluid (fresh water) One small section of riser found to be frozen at the well house door. Thawed same and cleared lines
	04:00	07:00	3.00			SURPRI	FLOWT	PRDT	T	Pre tower safety / ops meeting to discuss path forward. Drafted procedure to displace inner annulus to 60/40 tritherm (triethylene glycol). Took on 200 gal of liquid N2.
	07:00	11:00	4.00			SURPRI	FLOWT	PRDT	T	Walked lines and gathered necessary equipment. Broke glycol line at Expro stack pack bath. Added T with valves to facilitate blow down. Lined up lines to be able to take suction from the 125 bbl glycol tank deliver high pressure fluid to the heater string and returns from the IA to the 70 bbl sand jet tank. Returns truck on location. Shot tubing fluid level 703' @ 275 psi. Pressure up tubing with N2 to 700 psi IA at 60 psi. Re shot fluid level at 775' and 700 psi. After 10 minutes T=680 psi and IA = 260 psi.
	11:00	14:00	3.00			SURPRI	FLOWT	PRDT	T	Loaded IA with glycol 1585 psi and 15 gpm taking returns to the 70 bbl sand jet tank. Returns truck took load to 1R-18 for disposal.
	14:00	00:00	10.00			SURPRI	FLOWT	PRDT	T	Circulating the IA with heated glycol. 929 psi and 16 gpm inlet temp 105 F

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
03/15/2012	**24 hr Summary** Replaced washed out water dump valve with different style control valve. Displace glycol from inner annulus (IA) with N2. Load IA with power fluid (fresh water). Start jet pumping and flowing the well at 123 MSCF/D.									
	00:00	10:18	10.30			SURPRI	FLOWT	PRDT	T	Circulating the IA with heated glycol.
	10:18	10:30	0.20			SURPRI	FLOWT	PRDT	T	Start cooling down N2 pump in SLB GMS. Expro crew replacing washed out water dump valve.
	10:30	11:48	1.30			SURPRI	FLOWT	PRDT	T	Continue to cool down N2 pump. Shut in high pressure pump. S/I Heater and IA valves. Blow down soft hoses to 125 bbl glycol tank.
	11:48	14:48	3.00			SURPRI	FLOWT	PRDT	T	Pump N2 down the IA taking glycol returns up the heater string to the 125 bbl tank. Shut down trapping 1151 psi N2 on the IA.
	14:48	15:48	1.00			SURPRI	FLOWT	PRDT	T	Line up high pressure pump to load the IA with power fluid pumping down the heater string taking N2 returns to the sand jet tank.
	15:48	18:18	2.50			SURPRI	FLOWT	PRDT	T	load the IA with power fluid while bleeding N2 slowly as fluid rises in the IA to maintain 700 psi hydrostatic pressure at the jet pump / CAT standing valve.
	18:18	18:42	0.40			SURPRI	FLOWT	PRDT	T	Line up to pump power fluid from tank number 2. Expro flowing back through separator to tank #1.
	18:42	20:06	1.40			SURPRI	FLOWT	PRDT	P	Come on line with jet pump at 8 gpm. Gas returns to surface. well head pressure 494 psi. take Iso tube sample of gas (N2 29%, CH4 70%, C02 1%, SF6 0.373 ppm, R114 1.571 ppm). Fluid to surface at 20:00
	20:06	00:00	3.90			SURPRI	FLOWT	PRDT	P	Jet pumping at 11 gpm and 1800 psi at the IA. Well flowing 24 MSCF/D gas. Slowly working well head pressure down. Optimized rate 123 MSCF/D gas at 184 well head pressure.
03/16/2012	Normal jet pump operations with 5C pump in hole. Average rate 90 MSCFD gas and 180 BWD. Off loaded 280 bbls of produced fluid.									
	00:00	06:00	6.00			SURPRI	FLOWT	PRDT	P	Jet pumping at 11 gpm and 1900 psi at the IA. Well flowing 60 MSCFD gas. Slowly working well head pressure down.
	06:00	12:00	6.00			SURPRI	FLOWT	PRDT	P	Jet pumping at 11 gpm and 1890 psi at the IA. Well flowing 110 MSCFD gas. Slowly working well head pressure down.
	12:00	18:00	6.00			SURPRI	FLOWT	PRDT	P	Jet pumping at 11.5 gpm and 1990 psi at the IA. Well flowing 110 MSCFD gas. Slowly working well head pressure down.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	18:00	00:00	6.00			SURPRI	FLOWT	PRDT	P	Jet pumping at 11-12 gpm and 1990 psi at the IA. Well flowing 110 MSCFD gas. Slowly working well head pressure down. Rig up vac truck to take returns from upright number 251. Found broken valve stem on upright. Had to empty tank to break connection. Encountered packed sand in the bottom of the 400 bbl upright. Estimate 20 bbls of sand remains in tank and 10 bbls of sand off loaded with produced fluid. Total volume trucked away 280 bbls.
03/17/2012	Normal jet pump operations with 5C pump in hole. Produced 142 MSCFD gas and 148 BWD from 9 pm to 9pm 3/16-17/12. Rebuilt High Pressure Pump (HPP) #1 HPP #2 has approx 50 hrs. Returns averaged 2.19 % sediment.									
	00:00	06:00	6.00			SURPRI	FLOWT	PRDT	P	Jet pumping at 11 gpm and 1990 psi at the IA. Well flowing ~ 137 MSCFD gas. Slowly working XPIO gauge #2 down from 555 psi.
	06:00	12:00	6.00			SURPRI	FLOWT	PRDT	P	Jet pumping at 11 gpm and 1960 psi at the IA. Well flowing ~140 MSCFD gas. XPIO gauge #2 550 - 543 psi.
	12:00	18:00	6.00			SURPRI	FLOWT	PRDT	P	Jet pumping at 11 gpm and 1640 psi at the IA. Well flowing ~148 MSCFD gas. XPIO gauge #2 543 - 537 psi.
	18:00	00:00	6.00			SURPRI	FLOWT	PRDT	P	Continue jet pumping at 11 gpm and 1740 psi at the IA. Well flowing ~148 MSCFD gas. Working XPIO gauge #2 down slowly from 537 psi. Rebuilt High Pressure Pump (HPP) #1. Expect 300-400 hrs with feed water of 0.05 % solids.
03/18/2012	Normal jet pump operations with 5C pump in hole. Produced 75 MSCFD gas and 57 BWD from 9 pm to 9pm 3/17-18/12. Ice blockage developed in flare line forcing well to be shut in 1 hr to clear the line. Jet pumping in attempt to restart the flowing.									
	00:00	03:00	3.00			SURPRI	FLOWT	PRDT	P	Jet pumping at 11 gpm and 1740 psi at the IA. Well flowing ~140 MSCFD gas. XPIO gauge #2 533 psi.
	03:00	06:00	3.00			SURPRI	FLOWT	PRDT	P	Jet pumping at 11 gpm and 1740 psi at the IA. Well flow decreasing to 100 MSCFD then climbing to 125 MSCFD gas. XPIO gauge #2 dipping some but averaging 533 psi.
	06:00	09:00	3.00			SURPRI	FLOWT	PRDT	P	Jet pumping at 11 gpm and 1740 psi at the IA. Well flowing ~127 MSCFD gas XPIO gauge #2 dipping some but averaging 533-534 psi.
	09:00	11:00	2.00			SURPRI	FLOWT	PRDT	P	Jet pumping at 11 gpm and 1740 psi at the IA. Well flowing ~125 MSCFD gas XPIO gauge #2 steady at 533 psi.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	11:00	12:00	1.00			SURPRI	FLOWT	PRDT	T	Ice blockage issue discovered in the flare line. Forced to come down on the jet pump at 11:00 and shut the well in. SLB S/I and blew down surface suction and discharge lines. SLB pushed air across the tree to blow down Expro lines by passing the separator to the returns tanks. BOth Expro and SLB cleared the blockage, ice, in the flare line.
	12:00	20:00	8.00			SURPRI	FLOWT	PRDT	P	Flood GMS HPP lines and initiate et pumping at ~ 8 gpm. Walk jet pump rate up until a pressure of 1950 at the IA ~11 gpm. Well NOT flowing gas. XPIO gauge #2 climbing slowly from 550 to 570 psi. Spotted Tank O 400 bbl upright tank in secondary containment.
	20:00	00:00	4.00			SURPRI	FLOWT	PRDT	P	Coontinue to pump at ~11 gpm and 1950psi. Well NOT flowing gas. XPIO gauge #2 climbing slowly.
03/19/2012	Unable to restart production by jet pumping. Attempted to pull jet pump. Ongoing.									
	00:00	07:24	7.40			SURPRI	FLOWT	PRDT	P	Continue to pump at ~11 gpm and 1950 psi. Well NOT flowing gas. XPIO gauge #2 climbing slowly.
	07:24	08:09	0.75			SURPRI	FLOWT	PRDT	P	Lower rate from ~ 11 gpm to ~8 gpm and. Well NOT flowing gas. XPIO gauge #2 climbing slowly. Monitor pressure and raise rate back to ~11 gpm.
	08:09	11:09	3.00			SURPRI	FLOWT	PRDT	P	Continue to pump at ~11 gpm and 1950 psi. Well NOT flowing gas. XPIO gauge #2 climbing slowly. Heating well bore while preparing for slick line intervention.
	11:09	12:27	1.30			SURPRI	FLOWT	PRDT	P	Cool down N2 pumps. Shut down High Pressure Pump and S/I well. Blow down surface lines from well head through Expro, by passing the separator to return tanks with N2. Block in Expro. Blow down suction and hard line to 70 bbl sand jet tank with air. Come online with N2 to the tubing taking returns to the 70 bbl sand Jet tank. Slick line on location and spotting up to well.
	12:27	15:03	2.60			SURPRI	FLOWT	PRDT	P	Pump 11932 SCF N2 at 1600 psi to tubing. Shut down with 1600 trapped on the tubing and 400 trapped on the IA. Bleed the tubing to 600 and the IA to zero.
	15:03	16:33	1.50			SURPRI	FLOWT	PRDT	P	Slick line RIH with 3.5 dump bailer. Tag top of pump at 1919' POH and make up fishing tool string.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	16:33	20:03	3.50			SURPRI	FLOWT	PRDT	P	RIH with jet pump fishing tool string and attempt to latch up. After ~10 tries able to latch up and started hitting oil jar licks. Unable to move pump up hole. Attempt to sheer off the jet pump for 60 minutes. Slow oil jar action, spang action not visible. Pumped 155 gal of thritherm down the heater string, taking returns to the tubing. Able to break free, sand and silt found on tools at surface.
	20:03	22:03	2.00			SURPRI	FLOWT	PRDT	P	On surface with tools. Add lubricator and lengthen tool string with longer spangs and more weight bar.
	22:03	00:00	1.95			SURPRI	FLOWT	PRDT	P	Make up tool string with long spangs and thin the oil in the oil jars. RIH. Hard time latching up again, once latched working wire with indication of good hits. Start attempting to sheer off at 23:00. Free at 23:48. POOH and RD for night.
03/20/2012	Pulled 4 1/2" jet pump assy from 1919'. Attempted to shear knockout in standing valve. Pressure response from well indicated a possible shear however tattle tail on prong was not sheared. Continue to circulate hot glycol down the heater string taking returns from the inner annulus.									
	00:00	07:36	7.60			SURPRI	FLOWT	PRDT	P	Returns truck on location to suck down 70 bbl sand jet tank. Vacuum 30 bbls returned power fluid from 70 BBLs sand jet tank. Line up Inner Annulus (IA) to take returns to the sand jet tank. Come online with the GMS High Pressure Pump (HPP) down the heater string with heated glycol. Pumped 50 glycol to IA, shut in returns to the Sand jet tank and initiated circulation of heated glycol through t SLB line heater.
	07:36	08:00	0.40			SURPRI	FLOWT	PRDT	P	Cold weather advisory for Kuparuk notification. Called CPA Wells Supt to discuss. -36 F on location. Called out Slick Line (SL) unit.
	08:00	09:30	1.50			SURPRI	FLOWT	PRDT	P	Continue to circulate IA with heated glycol. Organized resources for potential Coiled Tubing (CT) intervention in case SL intervention failed to retrieve jet pump. SL on location. Pre Job safety discussion. CPAI Cold Weather Equipment Operating Variance reviewed, safety discussion held and document signed. SL crew released to rig up. Expro constructing 20'x20' revetment for sand trap. Sand trap and iron on location.
	09:30	12:30	3.00			SURPRI	FLOWT	PRDT	P	SL R/U, Cut back 200' of wire, 16' 2 5/8" stem, OJ, LSS, and stand by for 2 1/8 jars.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	12:30	13:30	1.00			SURPRI	FLOWT	PRDT	P	Cold weather advisory lifted -34 F. HES delivered 3000 gal N2. 55' lubricator, 33' tool string. PT w N2 to 700 psi RIH to pull jet pump W 4 1/2 PRS, S/D Latch @ 1919' SLM. Jar 1500-1800 for 45 minutes untill pump assy came free. Drilling Tool House delivered timbers and herculite for sand trap revetment.
	13:30	15:00	1.50			SURPRI	FLOWT	PRDT	P	OOH W/ jet pump assy. Lock missing small piece of packing. Lay down assy and cut 200' of wire. Drop 8' of 2 5/8" stem.
	15:00	16:30	1.50			SURPRI	FLOWT	PRDT	P	Pump 42 gal of Glycol from the IA to the tubing (T) Glycol tank has 37-38 bbls. RIH W/ 5'x3" pump bailer W/ Mule shoe ball. S/D @ 1932' SLM stroke bailer a few times. POOH w metal marks on bailer bottom, recovered piece of packing from lock on jet pump assy. No other solids in bailer. Stand by SLU and deliver pump to Y-Pad shop for disassembly. Found 1/2" x 3/8" piece of metal (appears to be shear stock) lodged in the throat of the jet pump.
	16:30	18:30	2.00			SURPRI	FLOWT	PRDT	P	RIH W 3.50 cent, 2' stem, 3.25 cent, 47' x 1" prong. Stop at 1850'. Bleed T to 600 psi. S/D @ 1932' SLM, attempt to tap past but unable to. POOH to inspect tools. OOH small amount of sand on tools and marks on prong.
	18:30	19:30	1.00			SURPRI	FLOWT	PRDT	P	RIH W/ 3.25 cent, 2' stem, 3.50 cent, XO,XO, 37" prong, distance from bottom centralizer to bottom of prong = 44", S/D @ 1933' SLM, jar down attempt to bounce past. Pressure indication on T and down hole XPIO P1 that knockout had sheared. POOH. OOH tattle tail not sheared.
	19:30	20:30	1.00			SURPRI	FLOWT	PRDT	P	RIH W/ 4 1/2" PRS, S/D @ 1932' SLM Tap down lightly. Unable to latch up. One friction bite after hand spanging held to ~ 500 lbs. POOH. OOH tool has silt on it.
	20:30	21:00	0.50			SURPRI	FLOWT	PRDT	P	RIH W/ 3.25" cent, 2' stem, 3.50" LIB, S/D @ 1933' SLM, Tap down POOH. Tool has silt on it and no impression.
	21:00	21:30	0.50			SURPRI	FLOWT	PRDT	P	R/D SL unit
	21:30	00:00	2.50			SURPRI	FLOWT	PRDT	P	Continue to circulate the IA with heated glycol.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
03/21/2012	**24 hr Summary** Spotted sand trap in containment, rigged up same. Bailed down to to lock, seal bore assembly, and sanding valve hung at 1957'. Knocked out KOBE saw XPIO #3 rise from 562 psi to 971 psi									
	00:00	08:00	8.00			SURPRI	FLOWT	PRDT	P	Continue to circulate the IA with heated glycol.
	08:00	08:15	0.25			SURPRI	FLOWT	PRDT	P	Pressure up Tubing with N2 to 700 psi. 40 bbls in glycol tank, S.G. = 1.087 corrected to 60 F
	08:15	09:45	1.50			SURPRI	FLOWT	PRDT	P	Slick line on location, perform prejob, rig up (0.125 wire), 2.125" stem, TS = RS,QC,6',QC,KJ,5',QC,LSS,QC. (OAL 280")
	09:45	10:45	1.00			SURPRI	FLOWT	PRDT	P	PT W N2 to 700 lbs, RIH W/3" x 5' pump bailer, sit down @ 1932' SLM tap down work pump bailer. Work down to 1933' SLM stick bailer tap up to free tools POOH. OOH no marks, recover 1 quart of sand.
	10:45	11:15	0.50			SURPRI	FLOWT	PRDT	P	PT W N2 to 850 psi
	11:15	12:30	1.25			SURPRI	FLOWT	PRDT	P	RIH W 3" x 5' pump bailer, sit down @ 1932 slm. Hit down 5 times work pump bailer for 30 min. Hit down 8 more times POOH. OOH recover 1 quart of sand. Good metal marks from the top of the lock.
	12:30	12:45	0.25			SURPRI	FLOWT	PRDT	P	PT W N2 to 850 psi
	12:45	13:30	0.75			SURPRI	FLOWT	PRDT	P	RIH W 3.48" CEN 3" X 1.875" stem 3.61" cen barbell and 1 3/4" sample bailer (17"), Zero @ bottom of cen, sit down @ 1931' SLM. Beat down very hard. Unable to make hole. Work tools by hand. POOH, OOH sample bailer full no metal marks.
	13:30	13:45	0.25			SURPRI	FLOWT	PRDT	P	PT W N2 to 800 psi
	13:45	14:45	1.00			SURPRI	FLOWT	PRDT	P	RIH W 3.48" CEN 3" X 1.875" stem 3.61" cen barbell and 1 3/4" sample bailer (28"), Zero @ bottom of cen, sit down @ 1931' SLM. Work tools by hand. Make 1' depth. Pull out of lock, sit back down . Work tools. Unable to make hole. POOH, OOH no metal marks very little in bailer.
	14:45	15:00	0.25			SURPRI	FLOWT	PRDT	P	PT W N2 to 800 psi
	15:00	16:00	1.00			SURPRI	FLOWT	PRDT	P	RIH W 3.48" CEN 3" X 1.875" stem 3.61" cen barbell and 1 3/4" sample bailer (17"), Zero @ bottom of cen, sit down @ 1932' SLM. Work tools by hand. Worked tools down 1'. Pulled 400 over to pull free. Set down, tap down, make 1 foot, pull free. POOH, OOH no metal marks. Bailer full.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	16:00	17:00	1.00			SURPRI	FLOWT	PRDT	P	Add 8' 2.125" stem and PT to 800 psi W N2. RIH W 3.48" CEN 3" X 1.875" stem 3.61" cen barbell and 1 3/4" sample bailer (28"), Zero @ bottom of cen, sit down @ 1931' SLM. Work tools by hand to 1932.5' SLM. Tap up to free tools. sit back down at 1931' SLM. Tap down on tools to 1932.5'. POOH, OOH no metal marks. Bailer full.
	17:00	18:15	1.25			SURPRI	FLOWT	PRDT	P	PT to 800 psi W N2. RIH W 3.48" CEN 3" X 1.875" stem 3.61" cen barbell and 1 3/4" sample bailer (28"), Zero @ bottom of cen, sit down @ 1931' SLM. Work tools to 1933' SLM. Tap up to free tools. sit back down at 1931' SLM. Tap down on tools to 1932'. POOH, OOH good metal marks. Bailer full.
	18:15	19:30	1.25			SURPRI	FLOWT	PRDT	P	PT to 800 psi W N2. RIH W 3.48" CEN 3" X 1.875" stem 3.61" cen barbell and 1 3/4" sample bailer (28"), Zero @ bottom of cen, sit down @ 1931' SLM. Work tools by hand to 1933' SLM. Tap up to free tools. POOH, OOH good metal marks. Bailer full.
	19:30	20:45	1.25			SURPRI	FLOWT	PRDT	P	PT to 800 psi W N2. RIH W 5' x 3/4" pump bailer. Sit down at 1931' SLM. Tap down and skip past lock. Sit down@ 1934' SLM tap down and work pump. POOH. OOH with pump blue fluid and 1 quart sand.
	20:45	22:00	1.25			SURPRI	FLOWT	PRDT	P	PT to 800 psi W N2. RIH W 3.48 cent 3' x 1875" stem 3.61" cent and equalizing prong. Sit down @ 1931' SLM. Work to 1934 no pressure change until prong removed from lock and KOBE. See XPIO gauge # 2 clime 200 psi. POOH. OOH with good metal marks on prong centralizer.
	22:00	22:45	0.75			SURPRI	FLOWT	PRDT	P	Watch well, little change in tubing pressure ~800 psi. 965 psi on XPIO gauge # 3. Shut down SLB HPP and shut in IA returns line at 125 bbl glycol tank. Shut down surface glycol circulation. Open IA to open top tank, 48 bbls, check for flow. No flow. Step up to 11 gpm circulating hot glycol down the eater string taking returns up the Ia to the 125 bbl tank. SLU rigged down for the night.
	22:45	00:00	1.25			SURPRI	FLOWT	PRDT	P	Continue to circulate the IA with heated glycol.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
03/22/2012	**24 hr Summary** Pulled Weatherford standing valve with polished bore @ 1957' RKB. Removed ball and both KOBE knockouts, reset at same. Set 3" RC jet pump (S/N: PH-1108) with spacer pipe and stinger assembly on 3.812 DB lock (OAL 200 ") @ 1942' RKB. Pushed 43 bbls glycol back to Expro stack pack. Displaced 50 bbls glycol from inner annulus to 125 bbl glycol tank. Loaded IA with power fluid, commence jet pumping activities pumping to the IA taking production from the tubing through the separator to return tanks.									
	00:00	06:45	6.75			SURPRI	FLOWT	PRDT	P	Continue to circulate the IA with heated glycol.
	06:45	08:45	2.00			SURPRI	FLOWT	PRDT	P	Slick line on location, perform prejob, rig up (0.125 wire), 2.625" TS = RS,8',QC,KJ,LSS,QC. (OAL 210") Cut 150' of wire.
	08:45	09:45	1.00			SURPRI	FLOWT	PRDT	P	PT to 800 psi W N2. RIH W 3.48" CEN 3" X 1.875" stem 3.61" cen barbell and 1 3/4" sample bailer (28"), sit down @ 1932' SLM. Work tools by hand, work down to 1932.5 POOH OOH good metal marks on bailer. Bailer empty.
	09:45	11:00	1.25			SURPRI	FLOWT	PRDT	P	PT to 875 psi W N2. Open up pressure dropped to 850 psi. RIH W 4.5" PRS sit down latch Weatherford SV @ 1931' SLM. Hit 10 OJ licks & 5 spang licks Pulled SV POOH W standing VLV.
	11:00	12:00	1.00			SURPRI	FLOWT	PRDT	P	PT to 860 psi W N2. RIH W 3" drive down bailer, sit down @ 2176' SLM / 2201' RKB tap down once POOH OOH bailer ful of fluid. Expro wrapped sand trap in rino hide (reinforced visqueen).
	12:00	13:15	1.25			SURPRI	FLOWT	PRDT	P	PT to 865 psi W N2. RIH W 4.5" Z-6 & 3.75 DB lock, Weatherford seal bore assembly, and standing valve W ball, seat, and both KOBE knockouts removed. Set lock in DB nipple @ 1913' SLM / 1957' RKB. POOH OOH W/ Z-6, tattle tail indicates good set.
	13:15	14:45	1.50			SURPRI	FLOWT	PRDT	P	PT to 860 psi W N2. RIH W 4.5" Z-6 & 3.812 DB lock & 3" RC jet pump S/N: PH-1108 ratio 6C (OAL 200") Stinger tip 1.73" ID. Sit down on stinger @ 1913' SLM tap down work past and set down at 1917' SLM set jet pump, good pull test, shear off POOH OOH tattle talil indicates lock NOT set.
	14:45	15:45	1.00			SURPRI	FLOWT	PRDT	P	PT to 860 psi W N2. RIH W 4.5" PRS sit down @ 1917' SLM. Hit 5 licks move jet pump up to 1910' SLM beat up on jet pump for 20 min. Pull jet pump free. POOH OOH. Jet pump looks good.
	15:45	16:15	0.50			SURPRI	FLOWT	PRDT	P	Redress lock, stinger looks good.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	16:15	17:45	1.50			SURPRI	FLOWT	PRDT	P	PT to 860 psi W N2. RIH W 4.5" Z-6 & 3.812 DB lock & 3" RC jet pump S/N: PH-1108 ratio 6C (OAL 200") Stinger tip 1.73" ID. Sit down on stinger @ 1913' SLM tap down work tools down and set down at 1919' SLM Beat down Z-6, good pull test, shear off, POOH OOH tattle tail indicates lock good set.
	17:45	19:15	1.50			SURPRI	FLOWT	PRDT	P	SL Rig down.
	19:15	20:00	0.75			SURPRI	FLOWT	PRDT	P	Pushed 33 bbls glycol to Expro stack pack tank to replentich Glycol used when loading the IA. 15 bbls glycol remain in the 125 bbl tank.
	20:00	23:24	3.40			SURPRI	FLOWT	PRDT	P	Line up N2 pump to displace the inner annulus with N@ taking glycol returns to the 125 bbls tank. Returned 39 bbls of glycol to the 125 bbl tank. Estimate 11 bbls of glycol left in the tubing.
	23:24	00:00	0.60			SURPRI	FLOWT	PRDT	P	Line up to pump N2 across the tree to Expro. Pressure test through sand trap to 1000 psi. Pressure test good.
03/23/2012	Unable to remove hydrate plug in production casing via dissociation. Bull head 250 gal140 F glycol down tubing via heater string and open pocket at 1944'. Bull head N2 down tubing to open pocket at 1944' taking returns to the 70 bbl sand jet tank. Bring well online under jet pump production.									
	00:00	03:45	3.75			SURPRI	FLOWT	PRDT	P	Blow air through surface lines in direction of supply and back through suction to tanks. Attempt to flood suction lines to HPP. Troubleshoot blockage. Flood lines, prime pumps.
	03:45	05:45	2.00			SURPRI	FLOWT	PRDT	P	Fill inner annulus with power fluid via the heater string while bleeding at IA to the 70 bbl sand jet tank. Start 795589 gal at 16 gpm. Raise rate to 22 gpm for 45 minutes. Reduce rate to 10 gpm, catch fluid at sand jet tank. Shut down pump 797513 gal - total 1924 gal.
	05:45	08:15	2.50			SURPRI	FLOWT	PRDT	P	Line up HPP to IA, taking returns & production to Expro. Start HPP. Fluid to surface at 07:21. 28% N2, 70%CH4, 0%CO2,0.423 ppm SF6, 2.144 R114 @ 08:00. Slow HPP rate to 5 gpm for 5 min, increase rate to 10 gpm.
	08:15	14:15	6.00			SURPRI	FLOWT	PRDT	P	Increase rate to 14 gpm 08:35, slow rate to 12 gpm 0846, slow rate to 10 gpm 08:56, increase rate to 12 gpm 09:07, increase rate to 14 gpm 09:28. Hold rate.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	14:15	16:09	1.90			SURPRI	FLOWT	PRDT	P	Start cool down of N2 pump. Come down on the HPP. Blow down all surface lines and line up to pump heated glycol to the tubing via the heater string. Pump 250 gal of heated glycol down the heater string while trapping pressure on the tubing and IA. 46 bbls of glycol in 125 bbl tank.
	16:09	18:09	2.00			SURPRI	FLOWT	PRDT	P	Lined up N2 pump to the tubing taking returns through the open pocket at 1944' to the 70 bbl bleed tank via the inner annulus. Pumped 11277 SCF, small amount of N2 returns observed at the returns tank. Shut down the pump.
	18:09	18:39	0.50			SURPRI	FLOWT	PRDT	P	Line up HHP to IA, taking returns & production to Expro. Start HPP at 13 gpm and 1500 psi. Open up the well to the separator.
	18:39	19:45	1.10			SURPRI	FLOWT	PRDT	P	Draw down well head through separator.
	19:45	20:21	0.60			SURPRI	FLOWT	PRDT	P	Draw well head to 100 psi, gas rate increased to 236 MSCFD, XPIO2 decreased to 350 psi. Shut in choke to build bottom hole pressure.
	20:21	00:00	3.65			SURPRI	FLOWT	PRDT	P	Attempt to stabilize rate at 490 psi. 0-150 MSCFD and slugging water.
03/24/2012	Normal jet pump operations gas flow trending down from 50 to 20 MSCFD. Water and solids production trending to zero. BHP @ XPIO 2 475-510.									
	00:00	03:00	3.00			SURPRI	FLOWT	PRDT	P	Well head 200-300 psi. Flow rates: ~ 50 MSCFD gas. Water consumed 8.3 bbls. BS&W 0.05% to 0.0%. Managing flow by target pressure of 490 psi on XPIO gauge #2, average 460 psi. Jet pumping at 11-12 gpm and 1000-1100 psi at the IA. Trace solids at the High Pressure Pump (HPP) inlet.
	03:00	06:00	3.00			SURPRI	FLOWT	PRDT	P	Well head 250-300 psi. Flow rates: ~ 40 MSCFD gas. Water produced 2.5 bbls. BS&W zero. Managing flow by target pressure of 490 psi on XPIO gauge #2, average 460 psi. Jet pumping at 11-12 gpm and 1000-1100 psi at the IA. Trace solids at the High Pressure Pump (HPP) inlet.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	06:00	09:00	3.00			SURPRI	FLOWT	PRDT	P	Well head 250-260 psi. Flow rates: declining from 35-25 MSCFD gas. Water consumed 1.7 bbl. BS&W zero. Managing flow by target pressure of 490 psi on XPIO gauge #2, increasing 460-477 psi. Jet pumping at 11-12 gpm and 1000-1100 psi at the IA. Trace solids at the High Pressure Pump (HPP) inlet.
	09:00	12:00	3.00			SURPRI	FLOWT	PRDT	P	Well head 175-250 psi. Flow rates: 35-25 MSCFD gas. Water consumed 2.5 bbls. BS&W zero. Managing flow by target pressure of 490 psi on XPIO gauge #2, increasing 450-525 psi. Jet pumping at 11-12 gpm and 1000-1100 psi at the IA. Trace solids after tank swap at the High Pressure Pump (HPP) inlet. Incident at 09:30 while swapping power fluid supply / return tanks the suction line to the HPP was frozen and jet pumping was temporarily down. Crews swapped back to the original configuration, diagnosed and rectified the issue.
	12:00	15:00	3.00			SURPRI	FLOWT	PRDT	P	Well head 250 psi. Flow rates:~25 MSCFD gas. Water produced 3 bbls. BS&W zero. Managing flow by target pressure of 490 psi on XPIO gauge #2, 502-511 psi. Jet pumping at 11-12 gpm and 1000-1100 psi at the IA. trace solids at the HPP suction.
	15:00	18:00	3.00			SURPRI	FLOWT	PRDT	P	Well head 250-225 psi. Flow rates: 20-25 MSCFD gas. Water produced 0 bbls. BS&W zero. Managing flow by target pressure of 490 psi on XPIO gauge #2, 510-485 psi. Jet pumping at 11-12 gpm and 1000-1050 psi at the IA. trace solids at the HPP suction.
	18:00	21:00	3.00			SURPRI	FLOWT	PRDT	P	Well head 225-200 psi. Flow rates: 27-20 MSCFD gas. Water produced 0. BS&W zero. Managing flow by target pressure of 490 psi on XPIO gauge #2, 485-475 psi. Jet pumping at 11-12 gpm and 1010-1000 psi at the IA. trace solids at the HPP suction.
	21:00	00:00	3.00			SURPRI	FLOWT	PRDT	P	Jet pumping at 11 gpm and 1000 psi at the IA. Slowly working BHP down.
03/25/2012	Normal jet pump operations gas flow trending down from 11 to 7.5 MSCFD. Jet pump rate increased to 13 gpm. Gas rates increased then trended lower ~14 -13 MSCFD Total gas produced from midnight to 20:00 9.3 MSCF. Water production 8.3 bbls as of 20:00. BHP @ XPIO 2 420 psi. Solids production zero.									

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	00:00	03:00	3.00			SURPRI	FLOWT	PRDT	P	Well head 175-160 psi. Flow rates: ~ 11-8 MSCFD gas. BS&W 0.0%. Managing flow by target pressure of 490 psi on XPIO gauge #2, average 500 psi. Jet pumping at 11-12 gpm and 1070 psi at the IA. Trace solids at the High Pressure Pump (HPP) inlet.
	03:00	06:00	3.00			SURPRI	FLOWT	PRDT	P	Well head 160-150 psi. Flow rates: ~8 - 7.5 MSCFD gas. BS&W 0.0%. Managing flow by target pressure of 490 psi on XPIO gauge #2, average 500 psi. Jet pumping at 11-12 gpm and 1070 psi at the IA. Trace solids at the High Pressure Pump (HPP) inlet.
	06:00	09:00	3.00			SURPRI	FLOWT	PRDT	P	Well head 150-250 psi. Flow rates: ~8 - 14 MSCFD gas. BS&W 0.0%. Managing flow by target pressure of 440 psi on XPIO gauge #2. Increased rate to drop bottom hole pressure 1300 psi at the IA. Trace solids at the High Pressure Pump (HPP) inlet.
	09:00	12:00	3.00			SURPRI	FLOWT	PRDT	P	Well head 250-220 psi. Flow rates: ~ 15 MSCFD gas. BS&W 0.0%. XPIO gauge #2, average 435 psi. Jet pumping at 1300 psi at the IA. Trace solids at the High Pressure Pump (HPP) inlet.
	12:00	15:00	3.00			SURPRI	FLOWT	PRDT	P	Well head 220 psi. Flow rates: ~ 15 MSCFD gas. BS&W 0.0%. XPIO gauge #2, average 425 psi. Jet pumping at 1317. Trace solids at the High Pressure Pump (HPP) inlet.
	15:00	18:00	3.00			SURPRI	FLOWT	PRDT	P	Well head 215 psi. Flow rates: ~ 13 MSCFD gas. BS&W 0.0%. XPIO gauge #2, average 425 psi. Jet pumping at 1315 psi at the IA. Trace solids at the High Pressure Pump (HPP) inlet.
	18:00	00:00	6.00			SURPRI	FLOWT	PRDT	P	Jet pumping at 1317 psi at the IA. Preassure at XPIO2 420 psi. 12 MSCF gas.
03/26/2012	Normal jet pump operations gas rates increased from ~10 to 17 MSCFD on increase of jet pump rate and lowering of BHP via the choke. Water production is 5 bbls as of 21:00. BHP @ XPIO 2 equals 375 psi. Solids production zero. Temp at the perforation is ~ 35 F at the coolest.									
	00:00	07:30	7.50			SURPRI	FLOWT	PRDT	P	Well head 200 psi. Flow rates: ~ 11-10 MSCFD gas. BS&W 0.0%. XPIO gauge #2 = 430 psi. Jet pumping at 11-12 gpm and 1317 psi at the IA. Trace solids at the High Pressure Pump (HPP) inlet.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	07:30	08:36	1.10			SURPRI			P	Increased jet pumping rate to 54% ~13 gpm. Dropping well head with a target of no less then 34 F at the perforations. Well head ~ 200 psi. BS&W 0.0%. XPIO gauge #2 = 415 psi. Trace solids at the High Pressure Pump (HPP) inlet.
	08:36	12:24	3.80			SURPRI			P	Well head ~200 psi. Flow rates: increasing from 1-18 MSCFD gas. BS&W 0.0%. XPIO gauge #2 dropped gradually to 380 psi. Jet pumping at ~ 13 gpm and 1340 psi at the IA. Trace solids at the High Pressure Pump (HPP) inlet.
	12:24	13:18	0.90			SURPRI			P	Issue with Gaschromatograph supply line freezing off in the Gas Mixing Skid at the regulator. Diagnosed and fixed problem. GC back on line.
	13:18	20:18	7.00			SURPRI			P	Well head ~200 psi. Flow rates: ~ 17 MSCFD gas. BS&W 0.0%. XPIO gauge #2 ~ 376.5 psi. Jet pumping at 13 gpm and 1340 psi at the IA. Trace solids at the High Pressure Pump (HPP) inlet.
	20:18	00:00	3.70			SURPRI			P	Jet pumping at 1340 psi at the IA. Preassure at XPIO2 375-376 psi. 17 MSCF gas.
03/27/2012	Opened choke, gas rate went from 17 mscf/d to 19 mscf/d. WHP from 193 to 190 psig.									
	00:00	12:53	12.89			SURPRI				Well head ~200 psi. Flow rates: ~ 17-16 MSCFD gas. BS&W 0.0%. XPIO gauge #2 375-374 psi. Jet pumping at 13 gpm and 1340-1336 psi at the IA. Trace solids at the High Pressure Pump (HPP) inlet.
	12:53	15:38	2.75			SURPRI				Lowered backpressure enough to bring WHP down from 201 to 192 psig, choke from 16.5 to 16.75, rate didn't change much from 16 mscf/d, FBHP went from 376 to 366 psia.
	15:38	20:03	4.42			SURPRI				Opened choke to 17.25 to drop WHP rate went from 17 mscf/d to 19 mscf/d , WHP from 193 to 190 psig , FHBP at XPIO2 from 365 to 358 psia. Volume cumulatives Midnight: 517 mscf produced, 593 BW 18:38: 530 mscf produced, 610 BW From midnight to 18:40, 13 mscf and 17 bbls of water.
	20:03	00:00	3.95			SURPRI				GC data stopped being updated, stopped the Diablo software and restarted, first good sample completed at 21:01.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
03/28/2012	**24 hr Summary** Normal jet pump operations gas rates increased from 19MSCFD to 21 MSCFD lowering of BHP via the choke. Water production is 18 bbls as of 19:00. BHP @ XPIO 2 equals 342 psi. Solids production zero. Temp at the perforation is ~ 34.4 F at the coolest. Gas 16 mscf.									
	00:00	04:19	4.32			SURPRI	FLOWT	PRDT	P	Spike in water production associated with stoppage in gas flow lasted about 14 minutes. No obvious cause, gas rates rose and accumulated gas rate over the hour appeared normal, but the water volume rose by 4 bbls between tank straps.
	04:19	07:25	3.10			SURPRI	FLOWT	PRDT	P	Opened choke from 17.25 to 17.75, BHP at XPIO2 dropped from 359 to 352 psia, gas rate rose from 19 mscf/d to 20 mscf/d, then over the next couple of hours fell back to 19. Coldest point on DTS trace-34.4°F.
	07:25	10:28	3.05			SURPRI	FLOWT	PRDT	P	Opened choke from 17.75 to 18.25 , BHP at XPIO2 dropped from 351 to 344 psia, WHP dropped from 177 to 167 psig, gas rate rose from 19 mscf/d to 20.5 mscf/d. Coldest point on DTS trace-34.3°F
	10:28	00:00	13.54			SURPRI	FLOWT	PRDT	P	Opened choke from 18.25 to 18.75. BHP at XPIO2 dropped from 345 to 342 psia, WHP dropped from 170 to 163 psig, gas rate initially rose from 22.5 to 23.5 mscf/d but then fell back to 21 mscf/d. Coldest point on DTS trace-34.4°F.
03/29/2012	Continued jet pumping operation and monitor data.									
	00:00	02:28	2.47			SURPRI	FLOWT	PRDT	P	Opened choke from 18.75 to 19.25, BHP at XPIO2 dropped from 343 to 338 psia, WHP dropped from 164 to 156 psig, gas rate went from 22 mscf/d to 23.5 mscf/d for about 25 minute and then declined back to 22. Coldest point on DTS trace-34.2°F.
	02:28	03:29	1.02			SURPRI	FLOWT	PRDT	P	Swapped from one HPP to the other. Temporary dip in BHP pressures of about 35 psi, resulted in a gas surge about 45 minutes later before everything returned to normal.
	03:29	00:00	20.52			SURPRI	FLOWT	PRDT	P	Interval at top of perfs dropped below 34°F, during gas surge to 25 mscf/d. Midnight to 20:00hrs = 18,000 scf and 20 bbls wtr.
03/30/2012	Contilnue jet pumping operation and monitor data.									

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	00:00	00:00	24.00			SURPRI	FLOWT	PRDT	P	No events of note, choke remained at 19.25 all day. BHP stayed between 319 and 325 psia all day. BHT measured at XPIO2 dropped from 35°F to 34.89°F which it has read for the last 6 hours. Most of the day 6 to 10 feet of the DTS string read less than 34°F with occasional periods above 34°F interspersed throughout. Generally rising gas rate from 22 mscf/d to 24.5 mscf/d.
						SURPRI				Total Midnight to 8 pm. 20.6 mscf 20.8 bbls of water
03/31/2012										
	00:00	00:00	24.00			SURPRI	FLOWT	PRDT	P	No events of note, choke remained at 19.25 all day. BHP stayed between 317 and 322 psia all day. BHT measured at XPIO2 remained at 34.9°F all day. For the second day, 6 to 10 feet of the DTS string read less than 34°F with occasional periods above 34°F interspersed throughout. Generally steady gas rate between 24 mscf/d and 25 mscf/d with three short spikes above 26 mscf/d.
						SURPRI				Total Midnight to 8 pm. 20.5 mscf 24.1 bbls of water
04/01/2012	Normal jet pump operations. WHP remained between 153 and 165 psig, and BHP stayed between 316 and 322 psia all day.									
	00:00	00:00	24.00			SURPRI	FLOWT	PRDT	P	No events of note, choke remained at 19.25 all day. WHP remained between 153 and 165 psig, and BHP stayed between 316 and 322 psia all day. BHT measured at XPIO2 rose about 0.03°F during the day, remaining around 34.9°F. For the third day, 6 to 10 feet of the DTS string read less than 34°F with the periods above 34°F increasing in number throughout the day. Generally steady gas rate between 24 mscf/d and 25.5 mscf/d.
						SURPRI				Total Midnight to 8 pm. 20.6 mscf 23 bbls of water
04/02/2012	Choke remained at 19.25 all day.Generally steady gas rate between 23.8 mscf/d and 25.4 mscf/d.									

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	00:00	00:00	24.00			SURPRI				The number of variations in GC total measured percentage (e.g. CH4 swinging between 94 and 101%) continued to rise today, but calibrations continued to match the calibration gas. Higher inlet pressure may be the cause. This causes some error in the computed "corrected" gas rate presented in InterACT (about 2-3%). Gas mass flow rates continued to be very smooth. Choke remained at 19.25 all day. WHP remained between 151 and 164 psig, and BHP stayed between 316 and 321 psia all day. BHT measured at XPIO2 rose about 0.02°F during the day, remaining around 34.9°F. For the fourth day, 6 to 10 feet of the DTS string read less than 34°F in the evening with this interval being slightly above 34 most of the time from midnight to 10 am. Generally steady gas rate between 23.8 mscf/d and 25.4 mscf/d.
						SURPRI				Total Midnight to 8 pm. 20.3 mscf 24 bbls of water
04/03/2012	Choke remained at 19.25 all day. Generally steady gas rate between 23.6 mscf/d and 24.8 mscf/d. WHP remained between 151 and 165 psig, and BHP stayed between 316 and 320 psia all day									
	00:00	00:00	24.00			SURPRI	FLOWT	PRDT	P	Choke remained at 19.25 all day. Generally steady gas rate between 23.6 mscf/d and 24.8 mscf/d with larger variations between 4 am and 10 am with no obvious cause. WHP remained between 151 and 165 psig, and BHP stayed between 316 and 320 psia all day. BHT measured at XPIO2 rose about 0.02°F during the day ending at 34.94°F. For the fourth day, 6 to 10 feet of the DTS string near the top of the perfs read less than 34°F, now down to about once per hour, showing the very slight overall increase in temperature.
						SURPRI				Total Midnight to 8 pm. 20.1 mscf 22 bbls of water
04/04/2012	Opened choke from 19.25 to 19.75 beans, Raise power fluid from 55-56% of pump drive max. in effort to get temp. down to 33°.									
	00:00	08:33	8.55			SURPRI	FLOWT	PRDT	P	Opened choke from 19.25 to 19.75 beans, BHP at P2 dropped from 318 to 315 psia, temperature dropped 0.02°F/
	08:33	14:21	5.81			SURPRI	FLOWT	PRDT	P	Raise power fluid pump drive rate from 54 to 55%, BHP at XPIO2 dropped about 7 psi, but rate was very unstable

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	14:21	20:00	5.65			SURPRI	FLOWT	PRDT	P	Raise power fluid from 55-56% of pump drive max. BHP dropped from 316 psia before the first power fluid rate increase at 14:20 to 300 psia. Temperature dropped from 34.94 to 34.80 in the first two hours. Power fluid flow rate rose from 450 BPD to about 465 BPD, but the rate variation went from +/- 5 BPD to +/- 60 BPD. Power fluid pressure rose from 1301 to 1452 psig.
	20:00	00:00	4.00			SURPRI	FLOWT	PRDT	P	Temperature still declining after increase in jet pump rate and choke opening. Has dropped from about 34.2 to 33.75°F (measured by DTS at coldest point in perfs) since this morning at 8 am. Gas rate rose about 3 mscfd. Total Midnight to 8 pm. 20.2 Mscf 26 bbls of water
04/05/2012	Continued lowering bottom hole pressure to bring BHT down. BHT at XPIO2 dropped 0.2°F and coldest point in perfs now below 34.5°F according to DTS. Gas rate rose from 26 mscf/d to 29 mscf/d.									
	00:00	04:30	4.50			SURPRI	FLOWT	PRDT	P	Raised Jet pump drive rate from 56 to 57%. BHP at XPIO2 dropped 9 psi. Power fluid rate went from 465 to 472 BPD.
	04:30	16:47	12.29			SURPRI	FLOWT	PRDT	P	Raised Jet pump drive rate from 57 to 58%. BHP at XPIO2 dropped 8 psi. Power fluid rate rose from 472 to 479 BPD.
	16:47	23:59	7.21			SURPRI			P	Continued lowering bottom hole pressure to bring BHT down. BHT at XPIO2 dropped 0.2°F and coldest point in perfs now below 34.5°F according to DTS. Gas rate rose from 26 mscf/d to 29 mscf/d.
						SURPRI				Totals Midnight to 8 pm. 23.0 mscf 26 BW
04/06/2012	Continuing to lower the bottomhole pressure to bring BHP down. Gas rate has risen from 29 mscfd to nearly 30 mscfd.									
	00:00	06:06	6.10			SURPRI	FLOWT	PRDT	P	Continuing to lower the bottomhole pressure to bring BHP down. Gas rate has risen from 29 mscfd to nearly 30 mscfd. Raised Jet pump drive rate from 58 to 59%. BHP at XPIO2 dropped 4 psi. Power fluid rate rose from 478 to 486 BPD.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	06:06	00:00	17.90			SURPRI	FLOWT	PRDT	P	Changed from pump number 1 to pump 2, stayed at 59%. PFP dropped from 1675 to 1650psig but the PFR only dropped from 486 to 483 BWPD. BHP at P2 rose from 285 to 287 psia.
						SURPRI				Total production midnight to 8 pm 27 BW 25 mscf
04/07/2012	Continuing to lower the bottomhole pressure to bring BHP down. Contilnue jet pumping operation and monitor data.									
	00:00	00:54	0.91			SURPRI	FLOWT	PRDT	P	Raised jet pump drive rate from 59 to 60%. Power fluid rate rose from 483 to 491 BWPD. BHP started at 286 psia and Power fluid pressure at 1690 psig
	00:54	02:01	1.13			SURPRI			P	Raised power fluid pump drive rate from 60 to 61%. Power fluid rate rose to 497 BWPD. BHP leveled off at 281 psia at a power fluid pressure of 1978 psig
	02:01	09:34	7.55			SURPRI			P	During electrical generator swap, measured power fluid pressure dropped by about 100 psi, but returned to normal over the next 10 minutes.
	09:34	23:58	14.41			SURPRI			P	Raised power fluid pump drive rate from 61 to 62%. Power fluid rate rose from 497 to 503 BWPD and pressure rose from 1796 to 1868 psig
						SURPRI			P	Produced from midnight to 8 pm 25.9 mscf 29 BW Gas chromatograph software performance in selecting Nitrogen separately from Methane improved today, so volumetric estimates were better than previous days.
04/08/2012	Continue jet pumping operation and monitor data. Remained at approximately 504 barrels of power fluid all day. The bottomhole pressure remained near 277 psia and the coolest interval measured by the DTS remained at approximately 34.5°F.									
	00:00	00:00	24.00			SURPRI	FLOWT	PRDT	P	Remained at approximately 504 barrels of power fluid all day. The bottomhole pressure remained near 277 psia and the coolest interval measured by the DTS remained at approximately 34.5°F.
						SURPRI				Midnight to 8 pm production volumes. 26605 scf 27 BW
04/09/2012	Opened choke to wide open, lowered back pressure on separator to 25 psig. Gas flow peaked at 140 mscf/d and dropped back to 40 mscf/d. DTS records temperature at 2446 to be below 33°F. XPIO ROC 2 temperature reading has dropped from 34.5 to 34.2°F.									
	00:00	06:30	6.50			SURPRI	FLOWT	PRDT	P	Objective, go for lowest possible pressure

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	06:30	08:40	2.18			SURPRI	FLOWT	PRDT	P	EXPRO collected triplicate water samples from upstream of choke, water leg of separator and power fluid charge pump of GMS. Atmospheric air samples collected at each location.
	08:40	09:59	1.33			SURPRI	FLOWT	PRDT	P	Delivered sand and ISOTUBE samples to Kuparuk shipping and receiving for distribution.
	09:59	12:50	2.86			SURPRI	FLOWT	PRDT	P	Opened choke to wide open, lowered back pressure on separator to 25 psig. Gas flow peaked at 140 mscf/d and dropped back to 40 mscf/d.
	12:50	16:08	3.30			SURPRI	FLOWT	PRDT	P	DTS records temperature at 2446 to be below 33°F. XPIO ROC 2 temperature reading has dropped from 34.5 to 34.2°F.
	16:08	19:58	3.84			SURPRI	FLOWT	PRDT	P	temperature decrease has levelled off at about 34.1°F on XPIO ROC 2. BHP has dropped from 277 psia prior to choke opening (at 1250 hrs) to 237 psia. Wellhead pressure has dropped from 184 psig to 27 psig. Gas rate has risen from 32 to 39 mscf/d.
	19:58	23:58	4.00			SURPRI	FLOWT	PRDT	P	Midnight to 8 pm production volumes. 29.5 mscf 35 BW
04/10/2012	Produced steadily at 40 MSCFD. Initiated removal of insulation on surface lines and stick build scaffold hooches in preparation for rig down and demob of well test equipment.									
	00:00	01:00	1.00			SURPRI	FLOWT	PRDT	P	Raising outlet gas pressure enough to take ISOTUBE sample caused well flow rate to read zero, then spike as pressure dropped. This is not a formation/tubing change.
	01:00	07:45	6.75			SURPRI	FLOWT	PRDT	P	Produced at 40 MSCFD with the well head pressure at ~31 psi while jet pumping at ~1875 psi.
	07:45	08:30	0.75			SURPRI	FLOWT	PRDT	P	Raising outlet gas pressure enough to take ISOTUBE sample caused well flow rate to read zero, then spike as pressure dropped. This is not a formation/tubing change.
	08:30	13:30	5.00			SURPRI	FLOWT	PRDT	P	Produced at 40 MSCFD with the well head pressure at ~31 psi while jet pumping at ~1875 psi.
	13:30	19:12	5.70			SURPRI	FLOWT	PRDT	P	Started removing blue board insulation from surface lines. Continued to produce at 40 MSCFD with the well head pressure at ~31 psi while jet pumping at ~1875 psi.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	19:12	19:42	0.50			SURPRI	FLOWT	PRDT	P	Changed from using EXPRO heater as the surface storage volume for glycol circulation to the 125 bbl open top in order to heat glycol in open top in preparation for shutdown. Temperature in circulation pumps dropped to 6F, then rose back to 65°F in the first half hour. Scaffold crew on location. Walk down stick built hooches, fuel tank stairs, and well house. Discuss planned work and initiate removal of tank farm hooch, Expro Atigun house hooch and CO2 tank railing.
	19:42	00:00	4.30			SURPRI	FLOWT	PRDT	P	Truck off 290 bbls of returns to 1R-18 for disposal. Continued to produce at 40 MSCFD with the well head pressure at ~31 psi while jet pumping at ~1875 psi. BS&W has been zero for the past 24 hrs. Midnight to 8 pm production volumes. 33 mscf and 29 BW
04/11/2012	Freeze protect IA, tubing, chemical injection line, and heater string from jet pump to surface. Blow down surface lines and equipment. Dispose of returns and initiate rig down procedure.									
	00:00	04:00	4.00			SURPRI	FLOWT	PRDT	P	Swap from pumping produced water "power fluid" down the IA to 60/40 Tritherm glycol to freeze protect well. Displace IA to glycol taking returns up the tubing through the Expro stack pack separator. Drawing glycol from Expro serarator bath, 125 glycol tank, and SLB line heater.
	04:00	06:00	2.00			SURPRI	FLOWT	PRDT	P	Glycol at the jet pump. Increase choke setting to hold 700 psi back pressure in effort to stall jet pump and bull head glycol into tubing / perforations. No indication on DTS temperature trace that any glycol went below the jet pump. Attempt to pump glycol down the chemical injection line. Pressure up to 2200 psi instantly. Bleed line to 70 bbl sand jet tank. Pump 80 gal glycol down the heater string.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	06:00	07:30	1.50			SURPRI	FLOWT	PRDT	P	Reduce choke setting to circulate glycol up the tubing while keeping the jet pump stalled and well killed. Bleed off chemical injection line to 70 bbl sand jet tank while pumping glycol into the IA at 1100 psi . Returns from CI line at 30 gallons away are clear and appear to be water sample caught 07:45. Returns from the CI line at 40 gallons away down the IA appear to be 60/40 glycol. Sample pulled at 07:47. 18 bbls glycol left in the 125 bbl tank.
	07:30	08:18	0.80			SURPRI	FLOWT	PRDT	P	Lost HPP # 2, switch to #1 resume displacing well to glycol at 10 gpm and 1143 psi on the IA taking returns to the Expro separator. Start to cool down N2 pump.
	08:18	08:54	0.60			SURPRI	FLOWT	PRDT	P	Lost prime on pump while drawing down SLB line heater bath. Out of surface glycol. Shut in well. Line up to start blowing down surface lines with N2.
	08:54	11:00	2.10			SURPRI	FLOWT	PRDT	P	Blow down Expro lines, separator, and hoses to tanks. Blow down surface HPP lines. Down on N2. All valves on well head shut and flagged. Begin RD
	11:00	20:00	9.00			DEMOB	PLUG	DMOB	P	Start to rig down all Expro / SLB treating lines. Remove spill containment under all treating lines. Disconnect Gas chromatograph lines. Haul off all remaining returned surface fluid for disposal at 1R-18. Stage portable heaters on pad for release. Scaffolding crew removed large tank farm hooch. Palletize SLB treating iron for storage in connex. Rig down all SLB treating lines from well head.
	20:00	00:00	4.00			DEMOB	PLUG	DMOB	P	Continue to rig down all test equipment.
04/12/2012	Rigged down and inventoried all SLB treating lines and stored in connex. Rigged down and staged all Expro treating lines for shipment. Turned off well site power and removed all power leads. Staged and released non mobile equipment, heaters / light plants/ compressors.									
	00:00	06:00	6.00			DEMOB	PLUG	DMOB	P	Cut all long hoses to ~25' lengths and stack on pallets. Stage all SLB iron and hoses in front of storage connex. Rig down propane tank and prep for transport to Brooks Range.
	06:00	09:00	3.00			DEMOB	PLUG	DMOB	P	load SLB connex with treating lines. Truck propane tank to Brooks Range.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	09:00	12:00	3.00			DEMOB	PLUG	DMOB	P	Drain and remove SSV pannels. return to CPF1. Staged all non mobile equipment for removal. Hand -y-berm removed all revetment supports. Shut off well site power unit. Cut all power leads to well site equipment.
	12:00	15:00	3.00			DEMOB	PLUG	DMOB	P	Rig down Expro treating Iron and stage for loading to back haul. Trucked off 4 heaters, 2 air compressors, one light plant. Spooled up well site electrical lines.
	15:00	18:00	3.00			DEMOB	PLUG	DMOB	P	Banded up lumber, insulation blue board, and returned to DTH. DTH removed Atigun house scaffolding.
	18:00	00:00	6.00			DEMOB	PLUG	DMOB	P	Continue to rig down all test equipment.
04/13/2012	Removed all Expro treating lines and ancillary equipment from location. Notified AOGCC of pending P&A. Crane on hold until tomorrow due to rig 27 broken down in road.									
	00:00	06:00	6.00			DEMOB	PLUG	DMOB	P	Drilling tool house crew removed the scaffolding in front of the Expro Atigun house and picked up all exposed revetment plus plywood. Rig 27 stuck at the kuparuk river west bridge blocking all dead horse traffic.
	06:00	12:00	6.00			DEMOB	PLUG	DMOB	P	Removed Cormorant WMD and choke skid from Atigun house.
	12:00	18:00	6.00			DEMOB	PLUG	DMOB	P	Rig moving and trailers allowed past however BP security unwilling to provide escort for 200 crane travel from dead horse to location. Rebook crane for tomorrow. Load all expro treating equipment on trailers. Notified AOGCC State inspectors of pending P&A activities (John Crisp)
	18:00	00:00	6.00			DEMOB	PLUG	DMOB	P	Lynden spotted 4 trailers on site for tomorrow picks. CH2 slowly removing released heaters from pad.
04/14/2012	Removed all major well test equipment from pad less well site generators. Built temporary well head scaffold for slickline and coiled tubing intervention.									
	00:00	06:00	6.00			DEMOB	PLUG	DMOB	P	sleep!
	06:00	08:00	2.00			DEMOB	PLUG	DMOB	P	Pre job to discuss lift plan. wait on crine and twin steer
	08:00	08:45	0.75			DEMOB	PLUG	DMOB	P	Crane and twin steer on location. Hold pre job and start spotting for fist pick.
	08:45	09:45	1.00			DEMOB	PLUG	DMOB	P	Rig up to well house. Cut DTS fiber optic lines 08:56. Remove well house. HES packed up DTS computers and hauled off.

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	09:45	10:45	1.00			DEMOB	PLUG	DMOB	P	Moved Atigun house with twin steer. Spotted same on trailer and trucked to peak yard for storage until the haul road weight restrictions are lifted. Lay down sand trap with crane. Loaded trap and trucked off. DTH removing 500 bbl tiger tanks and returning to Tanko yard.
	10:45	11:15	0.50			DEMOB	PLUG	DMOB	P	Rig CO2 tank. Pick and set on trailer for back haul to SLB deadhorse.
	11:15	12:15	1.00			DEMOB	PLUG	DMOB	P	Pick N2 tanks and spot on trailers for back haul. COlville fuel tanker and pump truck on location to drain and haul off excess fuel from well site tanks. Credit received for 4964 gal ULSD.
	12:15	13:15	1.00			DEMOB	PLUG	DMOB	P	Pick Schlumberger Gas mixing skid and spot on truck for back haul. Pick Expro stairs and lay down for demob.
	13:15	14:15	1.00			DEMOB	PLUG	DMOB	P	Lay down flare stack. Haul two 400 BBL uprights tanks to wash bay for cleaning. Load SLB work connex and storage connexes on trailers for transport to Deadhorse.
	14:15	15:00	0.75			DEMOB	PLUG	DMOB	P	Pick SLB line heater and spot on trailer for back haul. SLB crews left location.
	15:00	18:00	3.00			DEMOB	PLUG	DMOB	P	DTH removed well platform and SSV wing valves.
	18:00	00:00	6.00			DEMOB	PLUG	DMOB	P	DTH night crew cleaning up plywood and herculite from site. Hauling off all remaining equipment. Scaffold crew on location 20:47 to demo fuel tank stairs and build well platform. Updated BP planners with demob P&A schedule.
04/15/2012	Attempted to fish jet pump. Beat up for a total of two hrs and 30 minutes. Removed AZTAC and CPAI comms from camp. Staged well site generators for back haul. Return in the morning to try to retrieve jet pump assy.									
	00:00	06:00	6.00			DEMOB	PLUG	DMOB	P	no night operations

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	06:00	12:00	6.00			DEMOB	PLUG	DMOB	P	SLick line unit arrived on location 07:00. Found departing crews had removed bleed fittings from sand jet tank. called out wells goup to instal new bleed port. Rig up SLU w/ 0.125 wire, 8' x 2.625" Stem, KJ, LSS. RIH w/QC, 2'x 1.875"STEM, 2.85" GAUGE RING, TAG @ 1919' SLM, POOH, set down in station# 1, bobble past, POOH. Added 5' x 2.625" stem, RIH w/ 4 1/2 PRS,(brass pin), to 1920' SLM, beat up for 50 min, sheer off POOH.; tool sheared. AZTAC and CPAI communications crews removing all comm systems from location.
	12:00	18:00	6.00			DEMOB	PLUG	DMOB	P	Cut 200' wire, had to rebuild PRS to repin and clean. RIH w/ QC, 4 1/2 PRS TO 1920' SLM, latch, beat up for 50 min. Shear off, POOH cut 100' wire. RIH w/ same. Beat for 46 min, POOH SIBD, cut wire. Picked up catcher RIH. Slips catching repeatedly setting down 800'. POOH RD for night. Return with rebuilt PRS (new collets) and catcher W/out slips. DTH assisting Peak Precision power to remove louvers from well site generators and stage same for back haul.
	18:00	00:00	6.00			DEMOB	PLUG	DMOB	P	ASRC Drilling Tool House Loader operating on pad suffered a hydraulic hose failure. Security called. PIR mailed. CPAI Wells SUPT notified.
04/16/2012	Pulled dummy valve @ 1928' RKB, pulled jet pump, S/N: PH-1108 ration 6C (OAL 200") from 1942' RKB, pulled Weatherford seal assembly and gutted CAT SV from 1956' RKB.									
	00:00	06:00	6.00			DEMOB	PLUG	FISH	P	no night operations
	06:00	12:00	6.00			DEMOB	PLUG	FISH	P	SL crew traveled to location, inspected equipment, performed pre-job safety meeting. RU SLU, .125 wire, TS=8' x 2.625" stem, KJ, LSS. RIH w/ 4 1/2"GS (3/16" Brass) 4 1/2 bait sub as catcher sub (12"OAL) set on 3.812 DB-6 lock @ 1918' SLM / 1942' RKB. RIH w/ 4 1/2 OM-K, 1.25"JD to STA# 1 @ locate @ 1908' SLM, latch @ 1910' SLM / 1928' RKB, pulled, POOH, OOH w/ 1"DV on BK latch. RIH w/ 4 1/2 GS, latch 4 1/2 bait sub @ 1942' RKB, POOH, OOH bait sub empty....

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	12:00	18:00	6.00			DEMOB	PLUG	FISH	P	RIH w/ 4 1/2 PRS to 1919' SLM, latch, beat up 1900#s for 1 hour, hit down 3 times, sheared, POOH, OOH w/ sheared PRS, cut 200' wire. RIH w/ 4 1/2 PRS to 3.812 DB lock & 3" RC jet pump (s/N: PH-1108 ratio 6C (OAL 200"), latch @ 1919' SLM, beat up for 1 hour, came free, pulled POOH slow, OOH, carbolite in lowest stinger. Brass marks around top of DB-6 lock mandrel. RIH w/ 4 1/2 PRS latch to 1934' SLM, / 1956' RKB, pulled 3.75" DB-6 lock mandrel w/ weatherford seal bore assembly and gutted CAT SV. RDMO.
	18:00	00:00	6.00			DEMOB	PLUG	FISH	P	DTH load up last remaining Delta Leasing heater and hauled to Kuparuk. Cleaned up oil from loader spill on 4-15-12, loaded into transport tank and trucked to Kuparuk for disposal. Dropped off envirovac for camp demob. Break down deluge system.
04/17/2012	Disconnected XPIO data acquisition box from well.									
	00:00	00:00	24.00			DEMOB	PLUG	OTHR	P	Disconnected the XPIO data collection box from the well. Camp continues to rig down for move.
05/01/2012	Perform Full-Bore Cement Job									
	15:30	16:00	0.50			DEMOB	PLUG	CMNT	P	MIRU Cement Pump unit and cement tankers
	00:30	00:45	0.25			DEMOB	PLUG	CMNT	P	Pre-Job Safety Meeting
	00:45	01:15	0.50			DEMOB	PLUG	CMNT	P	Pressure Test hardline.
	01:15	01:30	0.25			DEMOB	PLUG	CMNT	P	Line up well to pump down tubing and take returns up the IA. Pump approx. 7 bbls of Freshwater down the tubing to establish flow. Commence batching cement to job specs.
	01:30	02:15	0.75			DEMOB	PLUG	CMNT	P	Pump 81 bbls of cement down the tubing and take returns up the IA until at surface.
	02:15	02:30	0.25			DEMOB	PLUG	CMNT	P	Close IA and line tree up to take returns up the flat pack until cement is at surface.
	02:30	02:45	0.25			DEMOB	PLUG	CMNT	P	Close valve to flat pack and line up tree to take cement up the chemical injection line to surface.
	02:45	03:15	0.50			DEMOB	PLUG	CMNT	P	Shut in well and flush surface lines with 35 bbls of fresh water.
	03:15	04:15	1.00			DEMOB	PLUG	CMNT	P	RDMO. Secure Location.
05/03/2012	Begin Plug & Abandon Procedures. Excavate around cellar box and remove; begin excavation to get a minimum of 5' below tundra level.									

Time Logs

Date	From	To	Dur	S. Depth	E. Depth	Phase	Code	Subcode	T	Comment
	06:00	07:00	1.00			DEMOB	PLUG	SFTY	P	Pre-Tower Meeting; PJSM.
	01:00	04:00	3.00			DEMOB	PLUG	MOB	P	Transport equipment to location and stage.
	04:00	05:00	1.00			DEMOB	PLUG	OTHR	P	Obtain Hot Work and Unit Work Permits.
	05:00	07:00	2.00			DEMOB	PLUG	OTHR	P	Begin to excavate around the cellar box to facilitate cutting and removal.
	07:00	11:00	4.00			DEMOB	PLUG	OTHR	P	After cellar box is removed, begin excavating around the wellhead to a depth of 5" below tundar level. Cut in a walking ramp to ease egress.
	11:00	12:00	1.00			DEMOB	PLUG	SISW	P	Set barricades and secure location for the night.
05/04/2012	Continue with Plug & Abandon Procedures. Cut off and remove wellhead, Have AOGCC Inspector sign off, weld on cap and backfill with spolis.									
	06:00	07:00	1.00			DEMOB	PLUG	SFTY	P	Pre-Tour Meeting and PJSM.
	01:00	02:30	1.50			DEMOB	PLUG	OTHR	X	Travel to location and clean up road entrance due to blowing snow. Free stuck vehicle in roadway.
	02:30	03:00	0.50			DEMOB	PLUG	OTHR	P	Obtain How Work and Unit Work Permits.
	03:00	03:30	0.50			DEMOB	PLUG	SFTY	P	Hold PJSM with welder and excavator operator.
	03:30	07:00	3.50			DEMOB	PLUG	RTWH	P	Begin window cutting procedures. Drill and cut windows in casings and tubing. Varify no gas or fluids and good cement to surface.
	07:00	07:30	0.50			DEMOB	PLUG	RTWH	P	Cut conductor until free and set off to the side.
	07:30	08:00	0.50			DEMOB	PLUG	OTHR	P	Verify good cement and obtain pictures with AOGCC Iinspector, John Crisp. Receive confirmation and weld cap to 16" conductor.
	08:00	08:30	0.50			DEMOB	PLUG	RURD	P	Release and rig down GBR Welder and close out Hot Work Permit.
	08:30	10:30	2.00			DEMOB	PLUG	OTHR	P	Backfill hole with existing spoils and observed that more fill was needed.
	10:30	15:00	4.50			DEMOB	PLUG	OTHR	X	Haul 3 loads (25 yds. each) of gravel and 2 loads (25 yds each) of overburden to location. Backfill to 4' above ice level to allow for settling. Total of 150 yards of extra backfill hauled and used on location.
	15:00	16:00	1.00			DEMOB	PLUG	RURD	P	Release equipment and secure location with barricades.

Detailed Operational Narrative

Start Time	Operation
12-Jan-12 00:00	**Started wellsite rig up.**
12-Jan-12 00:00	Attended morning PJSM at Ignik Camp with camp personnel and Precision Power Electrician, Simplex Grinnell. Spot Precision Power equipment (2 gen sets, 2 fuel tanks, switch shack, equip. shed) in containment area. Applied heat to warm up equip. Set wellhouse and applied heat to warm up tree. Continued working on camp. Wiring up alarm system (smoke detectors), telephones and computers. Bull cooks continue to prep rooms and kitchen. Super-chlorinated water has been circulated thru water system, waiting 24 hrs before flushing and testing. Lined up 3rd party services for potable water and waste water. Held pre-planning Gen-set installation duct work meeting.
13-Jan-12 00:00	**Continued wellsite rig up.**
13-Jan-12 00:00	Pulled BPV and confirmed no VR plugs in annulus valves. Installed integral flanges and associated jewelry.
13-Jan-12 00:00	All outside work ceased due to Phase weather conditions. Continued on inside camp work (fire detection system and water). Sent water samples to Lab for potable water. Install fire detection control panel.
14-Jan-12 00:00	**Continued wellsite rig up.**
14-Jan-12 00:00	Weather day, all outside work on hold for high winds and cold temps.
15-Jan-12 00:00	**Continued wellsite rig up.**
15-Jan-12 00:00	Clear snow after blizzard. Set rig mats & cribbing prepping for floats. Start installing duct work on Gen Sets. Precision Power connected fuel tanks to Gen Sets, prepped Gen Set and Switch Gear Shear for start up. Continued prepping camp for move in.
16-Jan-12 00:00	**Continued wellsite rig up.**
16-Jan-12 00:00	Clear snow from pad from blow. Spot two floats and rig mats for setting CO2 & N2 tanks. Install platform inside well house and install Skimpy Panels for both SSV's. Continued hookups for Prec. Power GenSets. Shut down all outside work because of Phase II weather.
17-Jan-12 00:00	**Continued wellsite rig up.**
17-Jan-12 00:00	On weather hold, Phase conditions. Plan to perform camp safety inspection pending weather.
18-Jan-12 00:00	**Continued wellsite rig up.**
18-Jan-12 00:00	All outside work shut down due to Phase II weather. Camp alarm installation completed and tested.
19-Jan-12 00:00	**Continued wellsite rig up.**
19-Jan-12 00:00	Performed camp safety inspection mid morning with Al Bergh & Gary Gauthier CPAI safety and Keith Dukowitz Nordic camp manager. Camp is approved for occupancy. Precision Power back up genset (power to block heaters on mains) went down during the blow. Back up has been taken in for servicing. Construction need to build stairs and a cat-walk to fuel the Precision Power tanks. Ordered out additional snow removal around Precision Power equipment and SLB staging sites. Two light plants and one heater down, requested service. Lynden delivered SLB equipment standing by for Peak crane. Civil crew continues to work on permanent well head platform. Second skimpy panel mounted. 3:50 pm spot crane to pick N2 tanks, CO2 tank, GMS, Line Heater, and SLB tool house.

20-Jan-12 00:00	**Continued wellsite rig up.**
20-Jan-12 00:00	Phase 1 Level 1. Contacted SimOps for scaffolding crew to build stairs and catwalk to access fuel hatch during fueling of well site generators. 9:00 Held pre-job safety meeting with Al Bergh CPAI safety, loader operator, SLB crews. Discussed off-loading of remaining pallets from Lynden trailers, installation of well site gen set louvers. John Brooks Precision Power to investigate temp power to GMS unit and SLB skid until main gen sets can be fueled. SLB crews pulled shipping plywood from GMS and removed snow from revetments around the 400 bbl upright tanks and 125 bbl Glycol tank and begin rigging up fittings. Precision Power was able to run a temp power line to the GMS. The lights are on and the unit is warming up. One exhaust louver was successfully installed on Gen set #2. SLB transported the Gas Chromatograph, GMS computers, and the Well Site Data Hub to location. Phase 1 canceled at 5:30 pm. Scaffold crew scheduled to walk down job site at 7:00 am.
21-Jan-12 00:00	**Continued wellsite rig up.**
21-Jan-12 00:00	06:00, held pre job safety meeting in conference room. DTH loader operator stuck behind rig move showed up after 9:00 with trailer of construction material. Unloaded and staged construction material. Installed exhaust louver on well site generator #2 and fuel lines to both generators. Civil crew also stuck behind rig move showed up after 9:00 begin working on permanent well head platform. Platform required extensive modification due to tree design with double SSVs above the deck. Scaffold crew showed up ~10:00 to walk down job and left. Hand-Y-Berm & SLB crews laid out treating line revetment for all SLB lines. Temporary gen set on GMS and Precision Power main generator block heaters failed. Gen set rigged down, removed and replaced. Temp Power to GMS back on entire unit is warm. Civil crew rigged down for the day, platform work ongoing. Held post job safety / planning meeting 19:00.
22-Jan-12 00:00	**Continued wellsite rig up.**
22-Jan-12 00:00	0600 pre job safety meeting. Wind chills -50°F - conducted safety assessment. 0700 HES crew on location prepping to lay fiber optic cable. 0730 ambient temp dropped to -36°F all hydraulic equipment idled, per support groups cold weather operating policy. Canceled trenching operations regrouped and held ops meting. 0800 SLB mechanic and Precision power electrician on site moving forward with burner installation. 0900 cold weather variance signed with DTH allowing loader operations below -35°F ambient. DTH dispatched with materials for insulated containment and loader mounted trenching device. 1030 -38°F ambient. HES setting up DAS DTS equipment. 1515 making up 1" jointed conduit to burry SLB and HES lines. Gouged out a 4" trench from camp to the well house. Made up 1" rigid conduit, snaked HES and SLB lines through conduit to well head and GMS unit, lay conduit in trench and packed ice back in the trench. Terminated SLB leads in the GMS and camp. Terminated the HES leads in camp. -42°F.
23-Jan-12 00:00	**Continued wellsite rig up.**

23-Jan-12 00:00	0600 pre job safety meeting. Wind chills -80°F, -51°F ambient - conducted safety assessment 0844 found ATF leak on pad in front of camp. Found Peak truck # K307 with transmission leak. Truck turned off, containment pool placed under transmission and tow truck called. Security notified and PIR e-mailed out. 0945 scaffolding crew on location setting stairs to fuel tank. 0952 watering in the trench containing the fiber optic runs to the well. SLB crew drove to DTH to cut support blocks for treating iron. 1200 scaffold crew finished stairs and catwalk to fuel tanks. Bulk fuel truck ordered, ETA 0800 1-24 Crews laid out blue board insulation for all SLB surface lines and installed the 1502 high-pressure treating iron gas line from the GMS to the well. SLB lost connectivity between their fiber optic line some time between 1100 and 1200. Efforts were made to reestablish connectivity through all 6 pairs but failed. HES aided by measuring the distance of the continuous fiber optic line. It appears as if the break is near the well head. SLB mechanic installed the line heater burner assembly and Peak Precision power hooked up temporary power. Attempted to test fire the burner but had issues with the controller. SLB is scheduled to call burner manufacturer in the am. Temperatures continue to be very cold all outside work is very slow with warm ups.
24-Jan-12 00:00	**Continued wellsite rig up.**
24-Jan-12 00:00	0600 safety / ops meeting. Discussed continued cold weather and plan forward. Well site fuel tank prepped for fuel delivery, wind break set up and laid nut plug down. 0800 call from town to discuss cold weather operations. All outside labor shut down unless work can be carried out with an enclosure and use of direct fired heaters to provide protection from the elements. Walking traffic allowed between the camp and GMS, work allowed in the GMS, well house, equipment connex, and line heater hooch, with hand tools, no power tools, large hammers or saws. On weather hold. Called CH2MHill dispatch and canceled bulk fuel delivery until the weather breaks. Non-mobile fuel continues as well as trucking of potable and waste water. 1328 SLB established connectivity to the Well Site Data Hub through the COP network. 1517 Peak wrecker leaving location with peak box van # K307. 1530 SLB safety held safety presentation covering COP cutting policy, foul weather policy, traction policy, impact gloves, and when to go to the medic. Burner on the line heater fired successfully. No success reestablishing connectivity in the SLB fiber optic lines. Water found in the conduit may have expanded and damaged the cable.
25-Jan-12 00:00	**Continued wellsite rig up.**
25-Jan-12 00:00	Held pre job safety meeting. Wind chills -80°F, -51°F ambient. 0729 found ice free conduit pipe 70' back from the well head attempting to move wire. It wiggles freely but will not pull by hand. Took 100' of 3" soft hose to KIC to warm it up in the shop. Mounted Isco syringe pump in GMS. Precision Power electrician checked fluids on the temp power gen set. Crew change.
26-Jan-12 00:00	**Continued wellsite rig up.**

26-Jan-12 00:00	0600 ops / safety meeting, new crew orientation. 0630 engineering ops call in. 0700 site control/safe work are review with crews. 0824 GMS temp gen set went down ½ tank of fuel, GMS still warm. 0900 lost three heaters. 0930 water truck attempting delivery frozen off, returning to shop to thaw. Fill in camp manager and staff alerted. Comm with crews to conserve water. 1100 attached cable clamp and com along to SLB fiber optic bundle. Applied a small amount of tension and cable popped loose, entire string is moving freely. Crews in for lunch and warm up. 1247 pre job meeting to discuss reinstalling cable. replacement heaters on location. Performed Visible fault locator (VFL) check of SLB cable, checked ok. Cleared trough of drifted snow and residual ice. Lay out replacement conduit. 1500 temp gen set back online. Water delivered to camp. 1530 pulled additional cable to well head trough new conduit. 1545 new fiber pulled to GMS and well house. Checked SLB with VFL, checked ok. Pulled HES line into well house and SLB cable into GMS break for warm up. Spliced connectors onto the end of SLB fiber. 1900 connectivity to the GMS skid though the SLB fiber optic line. Temp gen set to GMS back down. Called electrician to replace GMS generator. No spare gen set at this time. Bringing new alternator. Established connectivity with XPIO, Gauge #1 937.602 psi Temp 41.004F, Gauge #2 909.061 psi Temp 40.236F, Gauge #3 816.561 psi Temp 36.557F. 2100 electrician on site fueler on site. While fueling temp generator riser burped spilling 1/2 gal diesel into secondary containment. Diesel cleaned from containment with adsorbent and bagged for disposal. Well Supt, notified, security notified, PIR emailed.
27-Jan-12 00:00	**Continued wellsite rig up.** 0600 ops / safety meeting, new crew orientation. 0630 engineering ops call in. Water truck and fuel truck on location. Filling camp and non mobile equipment then bulk generator fuel tank. Additional safety/ spill discussion outlining fill procedure and spill mitigations regarding temp generator and bulk well site fuel tank. 0900 HES at well head terminating DTS and DAS lines. Optimation established connectivity from GMS through Well Site Data Hub (WSDH) to SLB InterACT* server in Sedalia. Precision Power on location, installed shorter fuel riser ~ 4", stood by for fueling procedure, flagged and attached long fuel riser to generator for reinstallation before temp gen set is moved. Gen set fueled with no issues, elevated the front end, installed 4" riser. Discussed fueling the generator bulk tank. This is not the bulk hose, they have no connection to dry lock. Abort attempt until proper hose with dry lock can be used. Held safety ops meeting with CH2MHill fuelers regarding 5000 gal bulk tanks fill procedure. 2" dry lock male to be installed on ULSD generator tank. 3" male dry lock to be installed on LEPD tank for line heater. Small fuel truck to be used for filling camp, non mobile equipment, and well site generators. Large bulk truck will be used to fill SLB line heater. 1425 HES terminating their fiber optic cable at the camp. 1500 acquiring DAS data. 1600 acquiring DTS data. 1800 SLB crew performed walk around. Temp GMS gen set still operating.
27-Jan-12 00:00	*Mark of Schlumberger
28-Jan-12 00:00	**Continued wellsite rig up.**

28-Jan-12 00:00	0600 ops / safety meeting. 0630 engineering ops call in. Phase 1 driving conditions due to slick roads, drifting snow, and lack of maintenance. Scheduled Down Hole Diagnostics (DHD) crew to perform MITT / MITIA on 1/22/12. Contacted valve shop re service tree valves. Discussion over wind chill as it relates to equipment. Scheduled to service tree as soon as reasonably possible. Lost 3 heaters during the night. 0900 day mechanic on location to start loader. Requested Peak Precision Power bring grinder and ground plates for bonding. 1320 loader up and running waiting on DTH operator. 1400 valve crew on location to service tree. 1420 loader operator on location spotting power cables. 1530 valve crew serviced tree valves and filled flow back SSV with hydraulic fluid. Attempted to fill injection side SSV with hydraulic fluid, exterior mounted dump valve failed and was leaking by to dump reservoir. Rigged iron from GMS to edge of well house on fluid side and from well house to 125 bbl tank on flow back side. Hooched and heated main power spools. Loader operator smelling fumes in cab suspects heater core leak. No drips apparent. Stopped loader, attached drip pan to loader with sash cord and returned the loader to KOC shop for PM / repair.
29-Jan-12 00:00	**Continued wellsite rig up.**
29-Jan-12 00:00	0600 ops / safety meeting. 0630 engineering ops call in. 0800 DHD on location, held pre job, issues with wellbore sync, reviewed well bore schematic and procedure with crew.0926 DTH on location delivering cut plywood for revetment base. Peak Precision Power on location running small gauge wire. 0930 DTH update on loader approximately 1 hr out. 1030 DHD on location to perform MITT / MITIA. Fluid levels at surface, T/I/O = 0/0/40 CI=0 Heater =0 Pumped IA to 400 psi and tubing to 3000 psi. Start T/I/O = 3000/440/40 CI = 420, Heater 510. 15 min T/I/O=2900/400/40 CI =445 Heater 500. 30 min T/I/O = 2850/400/40 CI=440 Heater 400. 45 min T/I/O = 2850/400/40 CI=325 Heater = 390. Tubing passed. Bleed CI line, IA tracked. Bleed Tubing. MITIA initial T/I/O = 600/75/40/ CI = 0 Heater = 50. Start T/I/O = 100/3000/40 CI 2950 Heater = 2950. 15 min T/I/O = 1050/2800/40 CI=2800 Heater= 2810. Bumped pressure, T/I/O = 1100/3000/40 CI=3000 Heater= 3000. 15 min T/I/O= 1100/2960/40 CI=2960 Heater = 2950. 30 min T/I/O = 1100/2950/40 CI=2940 Heater = 2950 Passes IA to T but CI in communication with the IA. Bleed CI line, T/I/O 1080/2525/40 CI=2500 Heater =2500. Bleed CI line second time T/I/O 980/1950/40 CI=1925 Heater 1960. Shut down & stung into test port with test tool, void at 0 psi, clean test fluid. Tried to bleed CI again will not bleed down, frozen line at bleed tank. Thaw lines and pump 10 gal diesel down CI line. Rig down DHD. Run power lines to all electrical. SLB equipment and begin to terminate lines. Lay hard hose from 125 bbl tank to GMS continue to build insulated boxes. Slick line on location, RU, drift W 3.58" to 2350' RDMO
30-Jan-12 00:00	**Continued wellsite rig up.**

	0600 ops / safety meeting. 0630 engineering ops call in. 0700 walked through possible WellView reporting issues with support. Can't find a problem. Note, some time log entries on second page of report because they are too long and not broken out. 0745 -35F winds calm. 0859 cold weather alert -36F all hydraulic driven equipment need Supt variance to operate. 0915 alerted that the camp has no water service. Water back up, then down, then up again. Fueled the well site generator main tank 3700gal. Constructed and installed all discharge hose from SLB line heater to GMS and GMS to 125 bbl open top tank. Valves and T's placed to tie into EXPRO treating lines once on location. Heated all high pressure valves on SLB heater, shut-in bypass, opened suction and discharge valves. Staged tree iron in well house. 1245 -40°F ambient crews traveled to KOC for CPA Supt orientation meeting and to construct hard hoses in KOC shop. Precision power terminated GMS power leads
30-Jan-12 00:00	at switch shack and both leads of SLB connex.
30-Jan-12 00:00	WSDH gateway set to correct time and synced to time.nist.gov.
31-Jan-12 00:00	**Continued wellsite rig up.**
31-Jan-12 00:00	Cold weather alert -36°F all hydraulic driven equipment need Supt variance to operate. Current conditions -44°F Winds SW 6 mph. Unloaded 3700 gals USLD fuel for Glycol Heater. Continue building blue-board boxes for hoses.
31-Jan-12 12:00	Accepted delivery of 4000 gals N2 and loaded into N2 tanks. Discovered that CO2 tank plug is incorrect. Made decision to hardwire CO2 tank (original plan). Optimation worked on InterACT™ straightening out channels.
01-Feb-12 00:00	**Continued wellsite rig up.**
01-Feb-12 00:00	Cold weather alert -36°F. All hydraulic-driven equipment need Supt variance to operate. Current conditions @ 0600 hrs -46°F Winds SW 6 mph, temps dropped to -51°F.
01-Feb-12 12:00	Continued blue-board construction. Change out day for SLB. Built blanking caps for PT lines w/N2. Hang fall-retractable harness on line heater. Put double thread 206 on suction and discharge of 125 bbl tank for EXPRO hookup. Worked on connex. Work on N2 gauges. Made supply and return hoses for N2 and CO2. Peak ordered disconnects for transfer house. Waiting on parts for finishing electrical.
02-Feb-12 00:00	**Continued wellsite rig up.**
02-Feb-12 00:00	Temperatures warmed up this morning to -29°F and work resumed. Electricians pulled out 500 MCM cable from GMS skid. Relocated the 50 amp fuse disconnect. C/O transformer to SLB tool house. Reconnect heaters to 50 amp disconnect to SLB tool house power feeder. Everything on site except EXPRO equipment (not arrived) has been grounded. Mounted 100 amp disconnect to CO2 tank. Parts have been Gold-Streaked today. ETA = Friday.
02-Feb-12 12:00	EXPRO crew arrived at Ignik Sikumi camp
02-Feb-12 12:00	SLB pressure tested hoses & secured to hard line. Worked on blue-board.
02-Feb-12 13:20	HMI change
03-Feb-12 00:00	**Continued wellsite rig up.**

03-Feb-12 00:00	PJSM & opts meeting w/ SLB & EXPRO & Pinnacle. Covered all orientations, site control, Kuparuk and the 2012 Denali Ascent. Load SLB line heater w/42 bbls TriTherm. Performed PPPOT Test on top seal of wellhead. Set rack of N2 bottles near wellhouse. Installed a high pressure hose from the IA to the open top tank w/needle valves to control bleed to the bleed tank. Install high pressure hose from the N2 bottles to the chemical injection valve on the wellhead. Opened N2 bottles to the needle valve on the chem. inj. line (1100 psi bottle pressure) Open needle valve to the chem inj. line and it pressured up immediately to 1100 psi. Held pressure for 10 min. No movement. Closed needle valve, bled press from hoses and disconnected. Bled pressure down from chem. inj. line from 1100 psi to 0. Closed needle valves. RD.
03-Feb-12 12:00	Pressure test discharge hoses. Attempt to run line heater and adjust burners but unable to get fuel from Precision fuel tanks. Applied heater to suction lines. Hooked up pressure sensor cords from GMS to tanks. Pressure test hoses from N2 & CO2 tanks. Knife switch installed for the CO2 tank. Knife switch for the connex heat installed.
04-Feb-12 00:00	**Continued wellsite rig up.**
04-Feb-12 00:00	PJSM w/ both crews (SLB & EXPRO). SLB clear fuel lines and get fuel flowing from tank to line heater and generators. Started up line heater and adjust burner. Installed SSV control in opts cab of GMS. Installed battery covers on valves on N2 & CO2 tanks & electric cords. Finished blue-board boxes.
04-Feb-12 12:00	Mounted and wired 4 disconnects. Terminated to GMS and brought generators on line. EXPRO cleaning out tank farm containment removing snow and prepping for arrival of equipment.
04-Feb-12 12:18	HMI change.
04-Feb-12 18:03	HMI change.
04-Feb-12 20:46	HMI change (Timestamp).
05-Feb-12 00:00	**Continued wellsite rig up.**
05-Feb-12 00:00	Received and unloaded Atigun House and two other loads for EXPRO. Rig up to well for warming ops. Double check that we are able to pump down the flatpack, or the annulus. Also verified we can circulate as planned. PT Hardline for Glycol system. Wired in AC to CO2 Tank, Tested Peak CO2 Tank Power Umbilical for CO2 Transport.
05-Feb-12 10:43	HMI change (Timestamp).
05-Feb-12 11:15	Start unloading Atigun building.
05-Feb-12 12:00	Pressure test HP Glycol lines. Rigged up and HARC for annulus displacement into 125 bbl tank. Ensured we have valves to circulate through the heating coils. Displace diesel into 125 bbl tank. Sucked out the 125 bbl tank.
05-Feb-12 21:35	New HMI build.
05-Feb-12 22:39	HMI change (Timestamp Swapped PT-301 and PT-305, were incorrect before Physically swapped the HPP Pump addresses).
05-Feb-12 22:42	New HMI build.
06-Feb-12 00:00	**Continued wellsite rig up. Work hold (CO2 tank leak).**
06-Feb-12 00:00	Continued circulating Tri-Term adjusting the circulation temperature & rate through the line heater to manage wellbore temperature. Brought the temperature at 60' to 32°F, 61°F at the turn around 1968'.

06-Feb-12 12:00	EXPRO continued rig up, waiting for delivery of the two final equipment loads. CO2 arrived, purged tank, and loaded 22 tons into our tank. PP electrician trouble shot generator and hard wire power from the gen-set to the heater for the CO2.
06-Feb-12 15:00	CO2 arrived and loaded by Air Liquide; completed offloading at 18:00.
06-Feb-12 17:40	Lifted tank stairs into place
06-Feb-12 19:00	Ceased operations to work on the CO2 tank. Waited on the CO2 transport to return and empty tank. Contacted BP L&V Pad Operator and advised of the small CO2 leak and we will keep him advised.
06-Feb-12 20:08	New HMI build.
07-Feb-12 00:00	**Work hold (CO2 tank leak).**
07-Feb-12 00:00	Installed guard rails around CO2 tank upwind. Waited on Air Liquide CO2 transport to come back and empty the CO2 tank. Monitored and kept pressure on CO2 tank above 200 psi. All work on pad on hold until problem is remedied.
08-Feb-12 00:00	**Repaired CO2 tank. Continued wellsite rig up.**
08-Feb-12 03:00	Air Liquide CO2 tanker on location to offload CO2.
08-Feb-12 07:30	CO2 off-load from tank to truck completed. Started bleeding to atmosphere.
08-Feb-12 08:00	Plumbed and turned on GC. One of the capillary columns was damaged. We were not able to contact vendor.
08-Feb-12 09:39	HMI change.
08-Feb-12 12:00	Filled CO2 tank with N2 for pressure test. Sent CO2 truck to KIC shop to warm up. Built a hooch over the CO2 tank and applied heat to keep tank temp above 0°F. Expro continued rig up.
08-Feb-12 12:20	EXPRO SCAN cables ran.
08-Feb-12 19:40	Restarted circulating glycol downhole warming up wellbore.
08-Feb-12 21:40	New HMI Build (cRIO Timestamp Acquisition time cut in half, cRIO Timestamp Flowmeter Dropout Changes).
09-Feb-12 00:00	**Continued wellsite rig up.**
09-Feb-12 00:00	Obtained replacement ferrules for GC and replaced ECD column. Initial testing showed that the GC appeared operational.
09-Feb-12 00:00	Continued pumping glycol to warm the wellbore. Plumbed in the GC unit and terminated the electrical.
09-Feb-12 00:55	CO2 tank pressured up with N2 to 325 psig SI for PT.
09-Feb-12 01:15	CO2 tank at 321.5 psig after 20 minutes (likely due to cooling, pulled one trunk out of "hooch" about 20 minutes before start).
09-Feb-12 01:35	CO2 tank at 321.3 psig after 40 minutes.
09-Feb-12 01:55	CO2 tank at 321.0 psig after 60 minutes.
09-Feb-12 02:22	CO2 tank at 321.2 psig after 1:27 passed, bled off lines.
09-Feb-12 06:30	CO2 tanker arrived back on pad after warm-up and started offloading, completed by 07:35 (tank heaters turned on).
09-Feb-12 07:20	HMI computer failure for 4 minutes.
09-Feb-12 11:52	Reversed glycol flow to down the annulus taking returns up the flat pack.
09-Feb-12 12:00	Precision Power (Peak) continue to trouble shoot the primary generator.
09-Feb-12 12:10	Lowered line heater temp to 100°F.
09-Feb-12 15:45	Line heater turned off due to sufficient heating (temperature was over 40°F throughout the annulus).
09-Feb-12 19:00	Finished rigging in relief line from the separator.
09-Feb-12 20:00	Finished the flow line connection from separator to standpipe.

09-Feb-12 22:30	Finished installing connection from well house to stand pipe.
09-Feb-12 23:38	New HMI Build (cRIO Timestamp InterACT™ Reconnect).
10-Feb-12 00:00	**Started preparing well for perforations (Procedure 4).**
10-Feb-12 00:00	Tracer cylinders do not have dip tubes as indicated in order, verified for both SF6 and R114.
10-Feb-12 00:00	Optimation only able to log data when ISCO is in remote mode, all changes in manual mode will not be recorded.
10-Feb-12 00:00	EXPRO installed data acquisition sensors and wiring. Finished rigging in gas metering skid.
10-Feb-12 00:01	Emergency stop accidently pressed in GMS, reset and restarted.
10-Feb-12 05:00	Turned back on line heater.
10-Feb-12 06:00	CTU: MIRU, PT hardline and lubricator with LRS to 350/4000 psig. PT N2 lines and GMS unit with N2 to 500/3800 psig.
10-Feb-12 07:00	Displaced CT with 30 bbl 104°F seawater. MU SOL online for 8 bbl at 1.1 bbl/min. Circulating pressure=3000 psig.
10-Feb-12 09:00	OPEN WELL. ZERO AT TBG HANGER, PUH TO BUMP AT STRIPPER. RIH PUMPING AT 1 BPM. CIRC PRESS = 2750 PSI. MU-SOL AT NOZZLE AT 2000 FEET.
10-Feb-12 09:30	INCREASE RATE TO 1.2 BPM PUH AT 60 FT/MIN TAG STRIPPER.
10-Feb-12 11:40	Computer fix required again, rigging up N2/CO2 mix line to CTU.
10-Feb-12 11:40	Down on HMI computer.
10-Feb-12 11:45	LINE UP SLB N2 DOWN THE CT TAKING RETURNS UP THE CT ANN. AT 350 SCF. RIH AT 30 FPM. TAG AT 2353.6' PUH 10 FEET AND WAIT ON N2 TO EXIT NOZZLE. PUH DISPLACING H2O FROM TBG AT 35 FPM.
10-Feb-12 12:45	New HMI Build (cRIO Timestamp, DTS cRIO Timestamp). Back on line at 13:05.
10-Feb-12 14:15	CT online with seawater. RIH to 2039' CTMD COLD WATER ONLINE AT 140.7 MM TOT. CIRC PRESS = 3850 PSI. WAIT AT 2039' FOR COLD WATER TO EXIT NOZZLE.
10-Feb-12 15:10	CT: RIH to 2139' at 30 ft/min. Waiting and monitoring temperatures.
10-Feb-12 15:10	CTU: Decreased rate to 0.8 BPM (circulation pressure 2037 psig). Decreased rate to 0.5 BPM (circulation pressure 1116 psig).
10-Feb-12 16:30	Install the high and low pilots on the choke manifold.
10-Feb-12 19:30	CTU: Lost all hydraulic pressure to unit. Closed pipe rams and manually locked. Increased N2 rate to 1500 scfm and blew down CT and CT annulus. Mechanic on location. CTU shut down pending repairs.
10-Feb-12 19:30	Circulating CO2 and N2 back to tanks.
10-Feb-12 19:30	EXPRO continue rig up 90% complete. SLB work on GC w/Keith. Precision Power trouble shoot Generator. Alaska State Boiler & Vessel Inspector on location and inspected SLB's CO2 Tank with no problems.
10-Feb-12 23:30	Begin gas mixing test. Did not go well. Output ratio was not being met.
11-Feb-12 00:00	**Completed preparing well for perforations (Procedure 4).**
11-Feb-12 00:00	Precision Power Electrician waiting on Cummins Technician and parts to repair Primary Generator. SLB repaired software delay. EXPRO and Scaffolding crew constructed hooch over end of Atigun Building. Waiting on crane for setting up flare and adjusting upright tanks. Will share crane with perforators.
11-Feb-12 05:00	CTU: waiting on mechanics to repair unit.

11-Feb-12 08:30	PJSM AND OPS MEETING, FUNCTION OPEN BOPE, OPEN CHOKE. PUH , RIH ADJUSTING RIH SPEEDS TO FUNCTION CHECK HYDRAULICS. N2 PUMP COOLING DOWN. RIH TAG PO BUSHING CORRECT DEPTH TO 2371'. PUH TO 2361'
11-Feb-12 09:00	HMI software update, pumps shut down, oil change on HPP #2.
11-Feb-12 09:00	CTU: PT N2 pump TO 500/4000 psi. Online N2 down CT at 500 scfd. Increased rate to 1500 scfd.
11-Feb-12 09:45	EXPRO pressure testing surface lines with air pressure (120 psig).
11-Feb-12 09:45	WHP = 150 PSI PUH AT 15 FT/MIN. CIRC PRESS = 1475 PSI. PARK CT AT 1994'. Circulating N2 down the CT up the CT annulus.
11-Feb-12 10:30	EXPRO checked the gas meters with air - all good - meter readings were the same.
11-Feb-12 10:30	EXPRO pressure test complete - all good.
11-Feb-12 10:45	Shutdown N2 pumping, lined up to reverse circulate down the CT annulus up the CT. RIH tag AT 2371' Reverse circulate. Water at surface, hardline to tanks freezing. Hooked up heaters and had MeOH delivered (slipstreamed some down the choke).
11-Feb-12 11:30	Brought on HPP#1.
11-Feb-12 12:00	POOH to surface bleeding down wellhead and CT. Hardline continues to freeze off, working to bleed down, CT frozen.
11-Feb-12 12:40	HMI shutdown.
11-Feb-12 12:46	New HMI Build.
11-Feb-12 12:47	HMI change.
11-Feb-12 14:00	Testing mixing and pumping CO2/N2 mix gas with tracer through the Bruce Valve (FM105). Bruce Valve closed at 15:00 (test over).
11-Feb-12 14:30	Pumped 1 bbl of MeOH to the CT. Cooled down N2 pumps and came online at 200 psig with N2. Increased pressure to 2200 psig. Pressure broke over at 1000 psig. Pressure increased to 2100 and broke over to 1400 psig. Pressure increased to 2400 psig.
11-Feb-12 16:30	Getting N2 to tanks.
11-Feb-12 17:45	Purge CT with 750 then 1000 scf of N2.
11-Feb-12 18:15	Continued purging CT at 1230 psig. Shutdown N2.
11-Feb-12 19:00	GC and ISCO not in logs during initial fill of the 4-1/2" tubing. We must go back to GC files for records, ISCO tracer information lost.
11-Feb-12 19:00	Online with N2 down the CT, RIH TAG AT 2364' PU TO 2360'.
11-Feb-12 22:50	Started pumping tracer gas mix downhole - 220 kg/hr
11-Feb-12 22:50	Tracer concentration in injected N2/CO2 blend low.
12-Feb-12 00:00	**Started working on cable detection and orienting perforations (Procedure 5).**
12-Feb-12 00:00	SLB bled down CO2 and N2 tanks. Found and repaired leak in the tracer line. Continued rig up of hoses for heater string for the upright tanks. BHP = 625 psia.
12-Feb-12 00:01	CT going out of hole, still pumping mixture. POOH at 75 ft/min, gas rate = 220 kg/hr, BHP = 565 psia, WHP = 540 psig.
12-Feb-12 00:45	On surface, closed in choke. Increased WHP to 600 psig. Stopped pumping gas mixture. Shut in swab. Online with N2 down CT. RDMO LOCATION STAGE ON PAD.
12-Feb-12 04:00	E-line departed Deadhorse WL shop to Gun Shop and secure 2 ea. 30' guns. Tailgate PJSMN and waited on final removal of coil tubing set-up equipment. Spotted up e-line unit and spotted-up third party crane.

12-Feb-12 05:25	Rigging up PT401 cable. Needs zeroed out.
12-Feb-12 08:30	Made up lubricator; tested lift to confirm crane and grease hoses will reach. Finished picking up pressure equipment. Made up tools (Completion Mapper, WPPT and Gyro data gyro tool) and performed tool checks. Moved to well. Stabbed on well and lined up for pressure testing using field triplex and diesel. PT 500-psi low; 1400-psi high.
12-Feb-12 13:30	Ran cables from EXPRO SCAN lab to the SLB Lab for data transfer (WITS).
12-Feb-12 13:30	Bled/blew down. Broke off stack at quick connect. Stabbed off at quick connect and pumped out all excess PT fluid below pump in sub and above swab valve.
12-Feb-12 14:00	Shutdown HHP #1 due to computer issues, 15:00 - HPP #2 online.
12-Feb-12 14:30	EXPRO finished work on the ESD system and function test - all good.
12-Feb-12 15:00	Opened well and RIH WPPT with gyro. Performed completion mapping to 2350' using Completion Mapper with WPPT and Gyro data tools. Determined clockwise tool spin (both RIH & PUH) at one full rotation per approximately 210' travelled or 1.7-deg/ft. Confirmed good signature from metal blast protectors on cable outside tubing, but rotation change from centralizer drift requires additional interpretation/investigation.
12-Feb-12 16:00	HMI problems, shutdown required.
12-Feb-12 16:09	New HMI Build.
12-Feb-12 16:30	EXPRO rigged up propane to the flare pilot and function test - all good.
12-Feb-12 19:45	Restarted glycol pump after shutdown.
12-Feb-12 22:30	POOH and rig back for night.
13-Feb-12 00:00	**Continue working on cable detection and orienting perforations (Procedure 5).**
13-Feb-12 00:00	Continued Completion Mapper logging to confirm tool face orientation for perforating.
13-Feb-12 10:00	EXPRO rigged up ESD loop on the ConocoPhillips SSV. ConocoPhillips valve personnel on site.
13-Feb-12 12:00	Change out AES crane and replaced w/Peak crane for possible 24 hr coverage. Used AES crane for setting up flare stack and putting steps on upright tanks. Set up containment around truck loading area.
13-Feb-12 15:30	Bled off chemical injection line. Bled 40 gal of diesel until glycol reached surface.
14-Feb-12 00:00	**Continue working on cable detection and orienting perforations (Procedure 5).**
14-Feb-12 00:00	Peak crane crew added a 30' extension section of lattice.
14-Feb-12 03:19	Shutdown glycol pumping (to see if well would cool down).
14-Feb-12 04:45	Restarted glycol pumping.
14-Feb-12 09:08	New HMI Build, HPP down.
14-Feb-12 09:15	Built blue-board box around ISCO pumps.
14-Feb-12 11:15	Started glycol pumping after HMI reset.
14-Feb-12 12:00	Peak Precision Power on site with Cummins mechanic to change out the engine control module of the primary well site generator. Generator successfully started and allowed to run.
14-Feb-12 13:20	Hooked up propane to flare.
14-Feb-12 18:00	Lit flare.
14-Feb-12 20:00	Shut off flare.
14-Feb-12 20:40	SLB E-line arrived on location, performed safety/SimOps meeting. E-line crew MIRU and surface tested tools.

14-Feb-12 21:00	Pressure tested SLB GMS and treating iron to the wing valve to 2020 psi. Walked pressure up to 1100 psi shut down and walked treating lines. Pressured up GMS and treating iron to wing valve to 2020 psi and shut in. Test good. Bled tubing to 1000 psi. E-line PT'd lubricator to 2021 psi.
14-Feb-12 21:30	Lined up to the tubing and began to load well with mixture of traced 77% N2 : 23% CO2.
14-Feb-12 22:45	Stopped pumping. BHP (middle gauge): 1425 psia.
15-Feb-12 00:00	**Perforated well. Started injection.**
15-Feb-12 00:30	Bled and drained lubricator. Re-shot through tools to confirm communication. Pick up perf guns. Perforating charges 2- 7/8" OD Power Jet Omega, 2906, 0&180 phase, 2 spf.
15-Feb-12 02:30	RIH tied in and oriented guns in preparation to fire. Encountered electrical issue with GMS unit. N2 pump soft start relay is tripping. Replacement parts located and Peak electrician dispatched from Deadhorse.
15-Feb-12 03:50	E-line opened well, BHP middle gauge dropped to 1361 psia.
15-Feb-12 04:25	Both N2 pumps tripping reset, N2 motor starter relay bad.
15-Feb-12 05:00	Waiting on electrician. 07:00 electrician on pad with replacement parts. 07:55 Soft start repaired pumps back on line.
15-Feb-12 08:00	08:03 Came on line with SF6 traced N2:CO2 blend venting out the Bruce valve 2" valve (FM107) closed to well. BHP 1342 psi at the middle gauge. 08:15 fired guns, indication of fire noted. CCL to top shot 25.8' CCL stop depth 2217.2' Shot 2243-2273' with 2.88" PJ Omega gun loaded 2 SPF 0/180 phased. Shots oriented 90 deg from blast protectors. Open 2" to well, closed Bruce valve. E-Line POH.
15-Feb-12 08:30	Down on pumps 08:24. Shut in pressure 1390 psi. 2" valve closed.
15-Feb-12 08:45	Observe pressure fall off to 1351 psia and 43°F at gauge #2. WHP 1110 psig. SLB E-line rigged off the well. All shots fired. Released crew.
15-Feb-12 09:45	09:36 Start pumping, BH middle gauge: 1354 psia and 43°F, mass flow 200 kg/Hr (1 kg/hr is approx 710 scf/day). 10:19 Shut down pumps at 1552 psia at the middle gauge. Monitoring pressure and temp @ 10:45 1507 psia and 42°F.
15-Feb-12 10:45	10:45 Started pumping at 200 kg/hr with 2" open. 11:21 At 1598 psia, stop pumping 2" closed.
15-Feb-12 11:15	Monitor pressure fall-off to 1391 psia BHP (middle gauge).
15-Feb-12 13:17	HMI change.
15-Feb-12 14:00	13:54 - Start pumping at 50 kg/hr, 1383 psia BHP. Pressure on the middle gauge slowly increasing to 1417 psia at 20:00.
15-Feb-12 16:00	Continued to inject mixed traced gas reducing rate to maintain 1420 psia BHP.
15-Feb-12 19:37	Lost N2 prime, opened bleed valve.
16-Feb-12 00:00	**Injection continued. Sand screen installation.**
16-Feb-12 00:00	Pumping traced, mixed N2:CO2 into formation.
16-Feb-12 07:00	Slick line on location with sand screen assembly. Held pre- job with crew and third party crane operator. Walk down well head, SLB & EXPRO equipment with HES slick line crew. Valve crew on location, service swab and injection side wing. Slick line assembling lubricator and screen.
16-Feb-12 10:30	Glycol leak on HPP flange.

16-Feb-12 10:30	Problem Wells Supervisor on location to inspect location and prep for Alaska Oil and Gas Commission witnessed Mechanical integrity test of the Inner annulus.
16-Feb-12 11:30	Continue to pump traced, mixed N2:CO2 into formation. Start to lift lubricator. Shut down pick due to excessive flex in the lubricator. Discuss plan forward. SL crew to source additional 5.5" lubricator.
16-Feb-12 13:18	Shut down GMS @ 13:16 to swap to primary well site generator and install updated HMI software.
16-Feb-12 15:00	Tested pumps through Bruce Valve (FM107).
16-Feb-12 15:30	Primary well site generator on line. GMS well bore heater string circulation back on line 15:01. GMS cryogenic pumps cooled down, pressure up, and operating 15:15. HES Nitrogen tanker on location 16:00. Off loaded 1900 gal liquid N2 into Nitrogen tank #2.
16-Feb-12 16:30	Picked up SL lubricator and rigged up to the well. Shut-in upper master and opened the swab. Pressure tested the lubricator with traced mixed N2:CO2 to 1400 psi. Bled lubricator to 1240 and opened up to well. Drift and tag with 3.60" gauge ring. Tagged at 2371' POOH. Shut swab and bled off lubricator to bleed tank. Lubricator plus surface equipment is 22' of 41/2 (ID 3.958") and 60' of 5 1/2 (ID 5.00").
16-Feb-12 16:48	Restarted pumping mixed gas downhole (after HMI shutdown). Pumping traced mixed N2:CO2 to formation at 20 kg/hr.
16-Feb-12 17:30	Out of hole, lay down lubricator, make up sand screen, OL 56' 8.5", load in lubricator. Third party crane crew changed out from day to night operator.
16-Feb-12 19:30	Picking lubricator with sand screen. Pressure-tested lubricator to 1310 psi with traced, mixed N2:CO2. 20:06 RIH, set down, hand spang sand screen into seal assembly, pull to establish latch, sheared off 20:38. POOH. 21:07 slick line off the well and rigging down surface equipment.
16-Feb-12 21:30	Continue pumping traced, mixed N2:CO2 into formation @ 1410 psia BHP (middle gauge) and 20 kg/ hr.
17-Feb-12 00:00	**Injection continued.**
17-Feb-12 00:00	Pumping traced mixed gas (77% N2:23%CO2) at 18 Kg/hr 1410 psia BHP (middle gauge).
17-Feb-12 02:30	Bled gas from top of the N2 pump.
17-Feb-12 04:27	Small N2 leak before it goes into gas mix
17-Feb-12 06:00	Pumping traced mixed gas (77% N2:23%CO2) at 18 Kg/hr 1412 psi on XPIO gauge @ 2226' MD.
17-Feb-12 09:00	Increased pump rate to 21 kg/hr to hit new target bottom hole pressure of 1420 psia.
17-Feb-12 17:10	Opened swab to monitor tubing pressure for MITIA. BHP pressure at middle gauge dropped to 1418 then 1415 psia. Increased rate to 24 kg/hr to raise tubing pressure.
17-Feb-12 17:17	Shutdown glycol pumping.

17-Feb-12 17:30	Performed pre witnessed MITIA - failed. Shut down glycol circulating pump. Double blocked returns to the 125 bbl glycol open top tank at the wellhead. Begin to pressure up IA. Mechanical gauge on IA companion valve not reading correctly. Decision made to continue test with GMS pressure gauge. Pressured the IA up to 1919 psig and blocked in at the pump. Pressure dropped 145 psi in the first 15 minutes and 98 psi in the second 15 minutes for a total of 243 psi. Max pressure loss may not exceed 10% in 30 minutes or 5% in the first 15 minutes. Will reattempt the test in the morning with new gauges. Restarted glycol pumping.
18-Feb-12 00:00	**Injection continued.**
18-Feb-12 00:00	Pumping traced mixed gas (77% N2:23%CO2) at 17 kg/hr and 1415 psia BHP (middle gauge).
18-Feb-12 15:30	We were discussing whether to shut down to condition tanks when well site generator accidentally taken off line. Down on the cryogenic pumps. Secondary generator started in 2 minutes and transferred power. Conditioned tanks (N2 and CO2). Transferred liquid N2 from storage tank to working tank and ordered out N2.
18-Feb-12 16:13	Start pumping mixed gas. Fighting the pumps unable to mix the product on spec. 16:20 Shut down cryogenic pumps.
18-Feb-12 16:30	Conditioning tanks and priming pumps in attempt to bring pumps back on line with in spec blend. 17:40 Started heating well and 18:01 started pumping traced mixed gas (77% N2:23%CO2) at 15 kg/hr and 1379 psia BHP.
18-Feb-12 18:00	Increased rate to 25 kg/hr pressure 1391 at on XPIO gauge @ 2226' MD. Nitrogen transport arrived on location. Need to fill both tanks. Shut down N2 pumping and closed 2" to well. Stopped circulation of the IA in preparation for MITIA.
18-Feb-12 19:30	While transferring N2, performed test MITIA - Passed. Pre T/I/O=1200/0/NA. Pumped up IA to 1900 psig and double-blocked in at wellhead. Initial T/I/O = 1200/1900/NA, 15 min 1200/1800/NA, aborted test. Repressurized to 1900 psig. Initial T/I/O = 1200/1950/NA, 15 minute T/I/O = 1200/1870/NA, 30 minute T/I/O = 1200/1795/NA. Total loss of 155 psi.
18-Feb-12 21:09	Restarted circulating heated glycol through the IA.
18-Feb-12 21:18	Restarted pumping traced mixed gas (77% N2:23%CO2) at 30-20 kg/hr and 1420 psia BHP. Large spikes in the N2 and CO2 rates. GC samples indicate N2 concentrations are high at ~81%.
19-Feb-12 00:00	**Injection continued.**
19-Feb-12 00:00	Adjusted GMS blend setting to 72% N2 : 28% CO to achieve 77% : 23% respectively on GC results.
19-Feb-12 00:00	Pumping traced mixed gas (77% N2:23%CO2) at 18-20 kg/hr and 1418-1420 psia BHP (middle gauge).
19-Feb-12 00:30	Continue to fight blending issues. Discussed options. Investigation of pump rate charts suggests that the N2 pump is leading the CO2 pump. As the CO2 pump falls behind the N2 pump drops off to zero output followed by the CO2 dropping to zero creating a saw tooth pattern. Woke up Optimation operator and discussed problem. P in PID changed from 0.25 to 0.01. Rate instantly stabilizes.
19-Feb-12 01:00	Changed P parameter in PID control. Rate response became very smooth with the noise at approx +- 5kg/hr.

19-Feb-12 07:58	HMI change.
19-Feb-12 08:15	In preparation for MITIA test, glycol pumping was shut down. IA and 2" valves to 125 bbl tank shut in.
19-Feb-12 08:30	Tubing pressure fell from 1420 to 1412 psia because of thermal contraction. Increased injection rate to maintain pressure.
19-Feb-12 10:18	Performed AOGCC-witnessed MITIA with Chuck Scheve. Passed with regard to total pressure loss but failed to stabilize. State man recorded a Fail Pre T/I/O=1268/0/NA. Pumped up IA to 1910 psig and double blocked in at the well head. Initial T/I/O = 1269/1910/NA, 15 min 1265/1828/NA, 30 min T/I/O = 1264/1770/NA, 45 minute T/I/O = 121264/1716/NA, Total loss of 140 psi in 30 minutes however pressure drop was nearly linear. Bled IA and resumed well bore heating. Reduced pump rate to 15 kg/hr. Tubing pressure rising because of thermal expansion. Decreased rate to maintain pressure. Pumps erratic.
19-Feb-12 11:00	
19-Feb-12 11:23	Restarted glycol circulation.
19-Feb-12 12:00	Shutdown pumps, heat well bore, conditioned tanks. (P=0.017 on PID).
19-Feb-12 13:00	Brought pumps online at 28 kg/hr and 1409 psia. Adjust rate to achieve 1420 psia BHP. HMI screen turned full green. Manually shutdown pumps. Monitor screen reverted to normal.
19-Feb-12 14:30	Transfer liquid N2 from storage tank to working tank. Cool down pumps.
19-Feb-12 16:26	Pumping traced mixed gas (77% N2:23%CO2) at 44-22 kg/hr and 1420 psia BHP.
19-Feb-12 18:30	HES N2 transport on location.
19-Feb-12 19:00	N2 transport contained 2040 gal. Off loaded and left with 7.5" or 534 gal on board. Off loaded 1506 gal into N2 storage tank.
20-Feb-12 00:00	**Injection continued.**
20-Feb-12 00:00	Experienced a short upset while pumping. Bled the back side of the N2 pumps slowly and let the GMS PID controllers pump through the upset.
20-Feb-12 00:15	Pumping traced mixed gas (77% N2:23%CO2) at ~21 kg/hr and 1420 psia BHP (middle gauge).
20-Feb-12 04:45	Shut down pumping to condition N2 tanks & transfer N2. Greased N2 and CO2 pumps. Transferred 160 gal N2 from storage to working. 1730 gal remaining in storage.
20-Feb-12 05:30	Brought pumps back on line at 1395 psia BHP. Increased rate to 51 kg/hr to reach target of 1420 psia BHP. Pumping traced mixed gas (77% N2:23%CO2) at ~20 kg/hr and 1420 psia BHP (middle gauge).
20-Feb-12 14:00	Tested EXPRO WITS with Optimation.
20-Feb-12 16:30	Shut down pumping to condition N2 tanks & transfer N2. Transferred 101 gal N2 from storage tank to working tank. 1629 gal remaining in storage. Cool down pumps. Restart pumps.
20-Feb-12 17:30	Brought pumps back on line at 1395 psia BHP. Increased rate to reach target of 1420 psia BHP.
21-Feb-12 00:00	**Injection continued.**
21-Feb-12 00:00	Pumping traced mixed gas (77% N2:23%CO2) at 22 kg/hr and 1420 psi on XPIO gauge @ 2226' MD.
21-Feb-12 01:15	Forced to bleed off the back side of the pump, fighting the N2 pump.
21-Feb-12 02:15	Lost real-time data on HMI.
21-Feb-12 04:30	Shut down pumping to condition N2 tanks & transfer N2. Transferred 238 gal N2 from storage to working. 1500 gal remaining in storage.

21-Feb-12 06:15	GMS lost communication to the well site data hub. Optimation crew worked with SLB InterACT™ support to reestablish communication.
21-Feb-12 12:30	Install EXPRO WITS Transfer Box in SLB lab.
21-Feb-12 13:00	Forced to bleed off the back side of the pump, fighting the N2 pump.
21-Feb-12 15:00	WITS transfer test with Optimation - all systems good.
21-Feb-12 15:20	Shut down pumping to condition N2 tanks & transfer N2. Added 20 bbl of potable water to glycol tank to compensate for evaporation. 125 bbl tank level 70 bbls.
21-Feb-12 17:15	Tracer running (both syringes?) at 0.0005mL/min.
21-Feb-12 18:28	HMI screen problems (fixed at 18:39).
21-Feb-12 21:59	Shutdown, CO2 leak at PT204.
21-Feb-12 23:38	Restart pumping, found one more leak fixed at 04:30-05:30 shutdown.
22-Feb-12 00:00	**Injection continued.**
22-Feb-12 00:00	Pumping traced mixed gas (77% N2:23%CO2) at 24-26 kg/hr and 1420 psia BHP (middle gauge).
22-Feb-12 05:30	Forced to bleed off the back side of the N2 pump, fighting the N2 pump.
22-Feb-12 06:00	Forced to bleed off the back side of the N2 pump, fighting the N2 pump.
22-Feb-12 07:50	Purged ISCO tracer pump of SF6 Tracer. Replaced SF6 tracer bottle with R-114 tracer. Flushed ISCO pump with R-114 tracer. Loaded both columns A and B to 103 ml each. Set pump rate at 0.01 ml/min.
22-Feb-12 08:15	Shut down pumping to condition N2 tanks & transfer N2.
22-Feb-12 09:15	Pumping traced mixed gas (77% N2:23%CO2) at ~ 25 kg/hr and 1420 psi on XPIO gauge @ 2226' MD. Transport of CO2 on location, Pre job safety meeting, transfer from tanker to working tank on the fly, complete 13:00.
22-Feb-12 18:40	Shut down pumping to condition N2 tanks & transfer N2.
22-Feb-12 23:15	Increased tracer to 0.04 mL/min.
23-Feb-12 00:00	**Injection continued.**
23-Feb-12 03:45	Shut down pumping (lost prime) to condition N2 tanks & transfer N2.
23-Feb-12 04:00	Pumping traced mixed gas (77% N2:23%CO2) at ~26 kg/hr and 1420 psia BHP (middle gauge).
23-Feb-12 10:15	Start adjusting R114 with mixed gas injection rate.
23-Feb-12 11:48	Shut down pumping to condition N2 tanks & transfer N2.
23-Feb-12 15:30	Shut down pumping to condition N2 tanks & transfer N2.
24-Feb-12 00:00	**Injection continued.**
24-Feb-12 00:11	Pumps acting erratically. Pumping traced mixed gas (77% N2:23%CO2) at ~29-30 kg/hr and 1420 psia BHP (middle gauge).
24-Feb-12 08:15	Shut down pumping to condition N2 tanks & transfer N2.
24-Feb-12 08:59	Refilled ISCO pump A with R-114.
24-Feb-12 10:59	Tracer switched to ISCO pump B.
24-Feb-12 13:00	Working on ISCO syringe pumps. 13:45 Filled syringe A.
24-Feb-12 13:45	Filled ISCO syringe A.
24-Feb-12 16:40	Shut down pumping to condition N2 tanks & transfer N2.
24-Feb-12 17:27	Start circulating glycol down hole.
25-Feb-12 00:00	**Injection continued.**
25-Feb-12 05:15	Shut down pumping to condition N2 tanks & transfer N2.
25-Feb-12 05:45	Pumping traced mixed gas (77% N2:23%CO2) at ~31-32 kg/hr and 1420 psia BHP (middle gauge).
25-Feb-12 08:09	Shut down pumping briefly to swap power from primary generator to secondary well site generator for scheduled oil change.

25-Feb-12 08:46	Shut down pumping briefly to swap power from secondary generator to primary well site generator for scheduled oil change.
25-Feb-12 16:59	Shut down pumping to condition N2 tanks & transfer N2. Installed new software in GMS unit, coordinated changes with SLB InterACT™. Unable to effect change. Reloaded original software.
25-Feb-12 17:12	New HMI Build.
25-Feb-12 19:59	HMI change.
25-Feb-12 20:50	Glycol pumps on line. Resuming well bore heating. Cooled down cryogenic pumps. Brought pumps online.
25-Feb-12 23:15	Surface Safety Valve tripped inadvertently. Reset and resumed pumping (23:16).
26-Feb-12 00:00	**Injection continued.**
26-Feb-12 05:00	Shut down pumping to condition N2 tanks & transfer N2.
26-Feb-12 05:35	Pumping traced mixed gas (77% N2:23%CO2) at ~33 kg/hr and 1420 psia BHP (middle gauge). Raised SLB line heater from 100 to 120°F in 10°F increments over a 2 hour period from 06:45 to 08:45.
26-Feb-12 09:05	Tracer (R114) filled in ISCO (syringe A).
26-Feb-12 12:22	Shut down pumping to condition N2 tanks & transfer N2. Installed base radio in GMS.
26-Feb-12 19:15	Swapped inlet/outlet on the heater strings (now going down heater string) while continuing mixed gas injection.
26-Feb-12 22:00	Shut down pumping to condition N2 tanks & transfer N2.
27-Feb-12 00:00	**Injection continued.**
27-Feb-12 06:00	Shut down pumping to condition N2 tanks & transfer N2.
27-Feb-12 06:20	Pumping traced mixed gas (77% N2:23%CO2) at ~34 to 35 kg/hr and 1420 psia BHP (middle gauge). Raised SLB line heater to 135°F at 08:00. Raised glycol rate to 15 gpm.
27-Feb-12 12:01	Tracer (R114) filled in ISCO (syringe A).
27-Feb-12 18:01	Shut down pumping to condition N2 tanks & transfer N2.
27-Feb-12 18:36	Pumping traced mixed gas (77% N2:23%CO2) at ~35 kg/hr and 1420 psia BHP (middle gauge). Pumped up both SSV hydraulic panels to 4000 psig at 20:00. Investigating an error that is creating a time delay in the data storage.
27-Feb-12 22:30	Took the GMS offline and attempted to restart the computer to correct the data latency problem.
27-Feb-12 22:45	Resumed pumping traced mixed gas (77% N2:23%CO2) at ~35 kg/hr and 1420 psia BHP (middle gauge). The data latency problem has not been fixed.
28-Feb-12 00:00	**Ended injection.**
28-Feb-12 00:00	Continued pumping traced mixed gas (77% N2:23%CO2) at ~35 kg/hr and BHP (middle gauge) of 1420 psia. The data latency problem has not been fixed and is continuing to worsen.
28-Feb-12 02:15	HMI system crashed, injection offline. Optimation troubleshooting and attempted to restart.
28-Feb-12 04:11	Met with project team, decided to halt injection. Minimum injection volume had been met.
28-Feb-12 07:45	Shut-in injection, begin pressure falloff. Stand-by for weather. Current temperature (-44°F).
28-Feb-12 07:45	Pump response had 40 second delay when setting was changed in HMI computer.

28-Feb-12 08:24	Shutdown computer for HMI upgrade.
28-Feb-12 09:00	EXPRO calibrated thermal mass meters using air.
28-Feb-12 10:05	Restart glycol down the heater string.
28-Feb-12 12:45	Optimation working on EXPRO flowback code.
28-Feb-12 15:50	EXPRO tested their ESD system.
28-Feb-12 16:40	EXPRO lined up equipment for pressure test.
28-Feb-12 17:10	Cleaned separator sight glasses
28-Feb-12 20:00	HMI down for maintenance, 20:30 computer back up.
28-Feb-12 20:45	Restart glycol down heater string.
29-Feb-12 00:00	**Began preparation for production (Procedure 11).**
29-Feb-12 00:00	Monitor data and standby during Cold Weather Shut Down (-42°F).
29-Feb-12 06:30	Shutdown glycol pump. Leak on pop-off of HPP #2.
29-Feb-12 07:46	Restarted glycol down heater string with HPP #1.
29-Feb-12 10:00	Installed pressure gauges upstream and downstream of the choke manifold.
29-Feb-12 12:10	Switched to HPP #2.
29-Feb-12 15:34	HMI down (unknown reason), 15:39 computer back up.
29-Feb-12 16:42	Power running very hot on HPP #2.
29-Feb-12 18:40	Shutdown HPP #2 and brought HPP #1 online.
29-Feb-12 19:40	HMI down for maintenance, 20:00 computer back up.
01-Mar-12 00:00	**Continued preparation for production (Procedure 11).**
01-Mar-12 00:00	On standby during Cold Weather Shut Down (-42°F). A glycol pump was shut down due to bad bearing and/or shaft. Parts on order.
01-Mar-12 02:30	Good PT on all hoses.
01-Mar-12 09:05	HMI down for maintenance, 9:10 computer back up, started pumping.
01-Mar-12 09:59	HMI down for maintenance, 10:01 computer back up.
01-Mar-12 10:00	HMI down multiple times for maintenance, 12:21 computer back up, started pumping.
01-Mar-12 13:00	Cold Weather restrictions lifted (-31°F) and work commenced towards completing Procedure 11. EXPRO's hardline and the GC lines were pressure tested successfully. 290 bbl of 140°F water was off-loaded into the upright tanks. EXPRO Stack Pac lines were connected and PT'ed and glycol circulated.
01-Mar-12 13:30	PT with N2 EXPRO lines to 400 psig.
01-Mar-12 14:14	PT with N2 EXPRO lines to 1200 psig.
01-Mar-12 14:34	Shut-in N2 pumps.
01-Mar-12 15:01	PT with N2 EXPRO lines to 2000 psig.
01-Mar-12 15:22	EXPRO PT test good, bled off pressure.
01-Mar-12 15:25	Holding 425 psig at needle valve on U/S Choke Pressure for InterACT™ to prove coms.
01-Mar-12 15:30	Shut EXPRO wing valve on tree.
01-Mar-12 20:20	Shutdown to rig up glycol lines to flow through EXPRO heater bath.
01-Mar-12 22:58	PT glycol lines (EXPRO).
02-Mar-12 00:00	**Continued preparation for production (Procedure 11).**
02-Mar-12 00:00	Continued making progress in completing Procedure #11.
02-Mar-12 04:10	Started glycol fill of the EXPRO heater.
02-Mar-12 04:25	Stopped glycol fill. Line heater bath @ 50.6".
02-Mar-12 04:50	Circulating glycol on surface.
02-Mar-12 04:56	Circulating glycol in the IA.
02-Mar-12 06:04	Glycol heater bath level 49.5".

02-Mar-12 06:45	Re-pressure tested warm EXPRO hoses to 2000 psig.
02-Mar-12 08:00	Begin testing EXPRO thermal meters, corrected low flow meter agrees with MicroMotion for N2 flow, high flow is low by ~8% from vendor K-factors.
02-Mar-12 08:35	SLB begins pumping N2 through separator.
02-Mar-12 08:40	Building back pressure in separator to 200 psig.
02-Mar-12 09:10	Begin sending N2 to meters and out to flare, meter testing.
02-Mar-12 12:35	Shutdown pumping for leak in SLB gas metering valve.
02-Mar-12 13:30	Started pumping a 50/50 N2/CO2 mixture, all gassed up, shutdown and conditioned and filled tank.
02-Mar-12 15:00	Started pumping only CO2. SLB metering valve not working.
02-Mar-12 16:13	Stopped pumping CO2. Began pumping N2.
03-Mar-12 00:00	**Continued preparation for production (Procedure 11).**
03-Mar-12 00:00	Continue working gas metering issues.
03-Mar-12 00:15	Stopped N2 pumping.
03-Mar-12 00:30	Begin testing high flow meter using CO2. Unable to test low meter as CO2 tank pressure prevented low flow. CO2 does not agree with vendor K-factors for the thermal meter.
03-Mar-12 00:45	Closed choke to hold 845 psig back pressure.
03-Mar-12 01:05	EXPRO created 2 Wits channels for raw data.
03-Mar-12 08:45	Stopped CO2 pumping.
03-Mar-12 08:57	Separator is bypassed. Ready for SLB to continue meter testing.
03-Mar-12 09:02	Started pumping CO2 to dry EXPRO lines.
03-Mar-12 10:47	Back online with glycol.
03-Mar-12 13:00	Testing meters with CO2 and still finding an offset between the thermal conductivity and the MicroMotion meter (FM201). While testing still, lost prime and basically emptied the CO2 tank. Had 3,000 gal of N2 delivered and offloaded.
03-Mar-12 14:30	Tore down Micro Motion Coriolis meters (FM201) in SLB skid.
03-Mar-12 20:00	Moved and installed and validated MicroMotion FM201 in EXPRO skid.
03-Mar-12 20:30	Dismantle and troubleshoot the 1/2" low flow thermal mass flow meter.
03-Mar-12 21:00	1/2" low flow thermal mass meter is broken.
03-Mar-12 21:00	Tested flare.
03-Mar-12 22:30	1/2" low flow gas meter out of service.
03-Mar-12 22:30	Down for computer problems.
03-Mar-12 23:30	Back online with glycol.
04-Mar-12 00:00	**Unassisted production started.**
04-Mar-12 00:00	Start testing of FM201 meter rigged-up in EXPRO Separator skid. Testing with N2 at four different rates.
04-Mar-12 00:30	Online with N2 for meter test.
04-Mar-12 06:00	Finished testing of the four varying rates and added a fifth rate test which is actually a re-test of the lowest rate test performed previously in order to validate/compare data.
04-Mar-12 08:05	Shutdown N2. Reconfigured EXPRO gas metering skid to go through both back-pressure valves.
04-Mar-12 09:30	Finished the re-test of the lowest rate and determined this data was acceptable. Shut down testing and lined the EXPRO separator up for flow. Optimization person was requested to make several changes in software.
04-Mar-12 09:45	Relocated back pressure gauge from metering skid to GC sample loop return line.

04-Mar-12 10:00	Down for computer problems. Pump shutdown.
04-Mar-12 10:45	Bleed pressure from separator slowly to test meters with InterACT™.
04-Mar-12 11:15	Down for computer problems. Pump shutdown.
04-Mar-12 12:05	Began pressuring up separator to 250 psig with N2.
04-Mar-12 12:25	Began pressuring up inlet to 1057 psig to flare with N2.
04-Mar-12 13:15	Zero water meter cumulative on MC2 and DAS.
04-Mar-12 13:54	**Open well to commence flow back**. Controlling WHP.
04-Mar-12 20:05	Production from 13:54-20:05: 4.1 mscf of gas.
05-Mar-12 00:00	**Unassisted production continued.**
05-Mar-12 00:00	Continued with flow back operation. BHP (middle gauge) started at 1080psia and as of 20:30 was around 750 psia. Well is loading up. Decision made to start prepping for Procedure #13 (Jet Pump Running and Pulling) after 23:00.
05-Mar-12 05:53	Downhole pressure increasing. Making adjustments to choke.
05-Mar-12 07:23	Begin slowly drawing down BHP to 650 psia.
05-Mar-12 08:31	Decreasing pressure in separator to draw down BHP.
05-Mar-12 12:30	Pulled fuses to CO2 tank heaters.
05-Mar-12 16:03	Tested jet pump power fluid HPP#1 @ 96%. 23 gal/min @ 1923 psig.
05-Mar-12 17:00	Weighed tracer bottles at KOC AB shipping/receiving. Cylinder tare weights: 15 lb, Final SF6 cylinder = 23.5lb, Final R114 cylinder = 23.3lb, 10lb initial both tracers.
05-Mar-12 17:00	**Total tracer used: SF6=1.5 lb, R114=1.7 lb.**
05-Mar-12 23:27	**Shut-in EXPRO separator at 63 psig.**
06-Mar-12 00:00	**Unassisted production ends. Jet pump installation.**
06-Mar-12 00:00	Started implementing Procedure #13 (Jet Pump Running & Pulling).
06-Mar-12 00:05	EXPRO WITS software change.
06-Mar-12 00:30	Rigged up to take N2 down IA, take returns up the heater string to the 125 bbl open top tank.
06-Mar-12 02:00	Start N2 pumping down IA taking returns up the heater string to 125 bbl open top tank.
06-Mar-12 05:14	Closed master valve on well.
06-Mar-12 08:30	Shutdown gas to the well. Bled off IA to EXPRO.
06-Mar-12 10:00	Leak found and repaired on the chemical injection cap on well head.
06-Mar-12 11:29	MIRU pump truck and tanker loaded with 200bbls F/W (fresh water). Begin heating F/W to 175 degree F. Start pumping fresh water with Little Red Services down the heater string taking returns up the IA out to the upright tanks.
06-Mar-12 12:30	Begin displacing N2 in IA with hot fresh water.
06-Mar-12 12:45	Restarted glycol surface pumping.
06-Mar-12 13:35	Water to surface.
06-Mar-12 13:38	50 bbl away, 1800 psi, 0.75 bbl/min.
06-Mar-12 16:05	150 bbl away, 1800 psi, 0.75 bbl/min, 155°F, 100 bbl to upright tank #2.
06-Mar-12 16:17	Shutdown pumping by Little Red Services, 159.5 bbl away.
06-Mar-12 16:20	200 bbl in upright tank #2. Down on pump.
06-Mar-12 16:45	Began blowing down lines from well head to tank farm with N2.
06-Mar-12 17:30	MIRU Slickline.
06-Mar-12 19:00	Flushing separator liquid line with air to upright tanks #1 and #2
06-Mar-12 19:00	PJSM with Halliburton Slick line crew and SLB Night Supervisor.
06-Mar-12 19:45	PT lubricator to 500 psi with N2. Bled down to 250 psi, opened well and RIH. Commence slick line operations as per Procedure #13.
06-Mar-12 20:11	RIH to 2040' tag.

06-Mar-12 20:57	RIH with bailer to try to get sample.
06-Mar-12 21:44	RIH with 2.78 to tag at 1957'.
06-Mar-12 22:23	RIH with seal bore.
06-Mar-12 22:58	RIH with "catcher" (bait sub).
06-Mar-12 23:48	POOH with DGLV.
07-Mar-12 00:00	**Jet pump installed. Production started with jet pumping.**
07-Mar-12 00:23	Slick line POOH with "catcher".
07-Mar-12 00:55	RIH with Jet Pump.
07-Mar-12 01:10	Hand spanging jet pump into nipple.
07-Mar-12 01:30	Finished Procedure #13 by setting the "5-C" Jet Pump @1919' SLM. RDMO location with the slick line unit.
07-Mar-12 02:00	Lined up well to flowback through EXPRO separator and into upright tank #1.
07-Mar-12 02:24	Begin taking water samples for the GKBU Lab and the USGS. Samples were moderately "silty".
07-Mar-12 03:12	Flare lit.
07-Mar-12 03:13	**Opened well.**
07-Mar-12 03:14	Choke increase to 128/64, EXPRO separator closed.
07-Mar-12 03:32	Dry gas at surface.
07-Mar-12 03:38	Gas going through EXPRO separator.
07-Mar-12 03:57	Water to surface. Solids with water being recovered.
07-Mar-12 04:00	Collected 3 water sample kits at first 5,7,&15 bbl of produced water along with 4 USGS water samples. This water is likely the closest we will achieve to sampling formation water.
07-Mar-12 04:00	Shut gas leg at separator.
07-Mar-12 04:02	Pulled water sample.
07-Mar-12 04:18	Gas leg opened.
07-Mar-12 05:45	Large amounts of sand with slugging causing problems for EXPRO.
07-Mar-12 06:24	Continue flowing back into upright #1. Begin taking BS&W samples. First sample was about 8% solids. Subsequent solids were 7%, 5%, 3.5% 2.8%, 1.5%, 0.5% and eventually went back up around 0.9% by 21:00. Total fluid produced by 21:00 was about 42 bbl.
07-Mar-12 08:55	EXPRO turbine meter not functioning. Damaged likely by sand.
07-Mar-12 09:00	Samples of produced sand and glycol sent to Kuparuk lab for testing.
07-Mar-12 11:00	Large amounts of sand to separator, tank, and suction hose.
07-Mar-12 20:33	EXPRO WITS software change.
08-Mar-12 00:00	**Production continued with jet pumping.**
08-Mar-12 00:34	Produced sand sample sent to Tim Collett (USGS).
08-Mar-12 04:00	Sand in the USGS water samples will be separated by Tom Lorenson (USGS) and sent to Bill Winters (Woods Hole) for analysis. This sand represents the first sand out of the well.
08-Mar-12 06:32	Air line to air/hydraulic SSV froze off causing the SSV to slowly shut in.
08-Mar-12 06:33	SLB slows down the power fluid pump rate.
08-Mar-12 06:36	Cleared the air line and opened the SSV. Air line was eventually placed inside heated "blue-board troughs" and a second air compressor was installed to allow for the compressors to be shut down and the Tanner Gas air dryer re-filled.
08-Mar-12 06:41	SLB back up on pump.
08-Mar-12 07:00	Diverted flow and suction from upright tank #1 to tank #2.
08-Mar-12 11:23	Lowered jet pump power fluid rate to reduce spikes on surface.

08-Mar-12 12:42	EXPRO WITS software change.
09-Mar-12 00:00	**Production continued with jet pumping.**
09-Mar-12 11:00	Pressure dropped abruptly at the separator and wellhead. Very little gas coming back with fluids causing the separator to lose charge. Closed choke to allow for pressure build up.
09-Mar-12 11:15	Opened choke. Minimum gas flow observed. Adjusted jet pump power fluid rate to ensure it was operating properly.
09-Mar-12 11:16	Shut in at choke temporarily.
09-Mar-12 11:24	Power fluid rate was reduced to 5.5 gpm.
09-Mar-12 11:30	Reduced response observed on the bottom gauge versus the other 2 gauges.
09-Mar-12 11:30	Pumped N2 across wellhead to EXPRO separator to Switched to upright #1 to facilitate tank strapping (excessive agitation causing plumb bob strap to give inaccurate readings).
09-Mar-12 11:33	SLB increasing power fluid pump rate required to achieve 1,400 psig.
09-Mar-12 11:38	Turned off the jet pump power fluid pump. There was an immediate increase observed on the middle gauge (a 400 psi increase in 10 minutes). Determined that the jet pump was functioning properly and power fluid pumping was resumed.
09-Mar-12 11:43	SLB up on the power fluid pump. Working the power fluid rate up slowly to achieve 1,800 psig.
09-Mar-12 13:03	Authorization given to go below 650 psia BHP (middle gauge).
09-Mar-12 13:05	Asked EXPRO to ease open the choke allowing the BHP (middle gauge) to fall below 650 psia, if needed to start flow.
09-Mar-12 13:05	No liquid gain in the last 0.5 hour.
09-Mar-12 13:10	N2 pumps cooled down and SLB asked to provide N2 across the tree to EXPRO to help control separator (re-charged the separator up to approximately 125 psi).
09-Mar-12 13:12	SLB begins pumping N2 across tree to get pressure in separator.
09-Mar-12 13:17	N2 flowing across the tree.
09-Mar-12 13:30	No fluid at choke.
09-Mar-12 13:40	Divert from upright tank #2 to #1.
09-Mar-12 13:48	Shut down N2 pumps.
09-Mar-12 14:37	Pressure slowly falls back. Continue making adjustments with pump and choke to maintain flow.
09-Mar-12 14:38	Large decrease in BHP (middle gauge) from 650 psia to <520 psia.
09-Mar-12 14:38	Apparent blockage (hydrate?) released at 525 psia (top gauge), 649 psia (middle gauge).
09-Mar-12 15:06	Small pressure spikes seen on downhole gauges.
09-Mar-12 15:19	Produced 1.5 bbl of water between 15:00-15:15.
09-Mar-12 15:22	Well essentially died and failed to produce fluids. Continue making adjustments to regain flow.
09-Mar-12 16:11	Dropping WHP by 25 psi and returning to same choke setting.
09-Mar-12 16:28	Top and bottom pressure gradients behaving in an inverse manner. Suspected hydrate problems related with screens/formation.
09-Mar-12 17:00	Still observing inverse gradient P behavior between gauges.
09-Mar-12 17:31	Pump started behaving erratically. It was fluctuating between 4 & 18 gpm.
09-Mar-12 18:00	SLB indicated possible sand problems in pump inlet or outlet. After some pump perturbations, the pressure gradients almost equalized.

09-Mar-12 18:09	Shut jet pump down for troubleshooting. Flush lines and remove screen on suction line. Screen and line were clogged with sand. Re-routed hoses on uprights tanks to facilitate suction from Tank #1 and flow into Tank #2 in order to allow "settling" of solids.
09-Mar-12 18:56	Jet pump back online, pumping into upright tank #1 and out of upright tank #2.
09-Mar-12 19:08	Switched suction to upright tank #1 and returns to tank #2.
09-Mar-12 20:08	Well started flowing again.
09-Mar-12 20:15	Momentary loss of power for EXPRO data logger. Back online within seconds.
09-Mar-12 20:44	Slow decrease in WHP and separator pressure. Increasing jet pump power fluid drive from 67% to 68%.
09-Mar-12 21:38	Switched suction to upright tank #1 and returns to tank #1.
09-Mar-12 21:56	Possible blockage or screen problem based on downhole gauges pressure gradients.
10-Mar-12 00:00	**Production continued with jet pumping. Stopped production to replace a washed out separator control valve. Production restarted.**
10-Mar-12 00:00	Continued efforts to keep well flowing.
10-Mar-12 00:30	Vac truck starts sucking out upright tank #2, Starting strap: 311.67 bbl, ending strap: 210 bbl. 110 bbl of produced water manifested.
10-Mar-12 00:45	Shut down power fluid HPP #1 in order to remove and install a new HPP #2.
10-Mar-12 01:00	Resumed jet pump operations.
10-Mar-12 01:10	Shut-in HPP #1. Disconnected lines from HPP #2 for a pump swap.
10-Mar-12 01:19	Back up and pumping power fluid.
10-Mar-12 01:45	Switched suction to upright tank #1 and returns to tank #2.
10-Mar-12 02:51	EXPRO data acquisition down for battery back up change and clock change.
10-Mar-12 02:52	EXPRO data acquisition back online.
10-Mar-12 02:56	EXPRO data acquisition froze and stopped logging. Problem fixed in seconds.
10-Mar-12 05:45	Changed EXPRO data acquisition computer back to correct time.
10-Mar-12 06:00	EXPRO not sending data, time was changed by mistake during backup battery change.
10-Mar-12 06:27	Reset EXPRO data logger and data being received again.
10-Mar-12 06:32	Shut down power fluid pumping in order to re-configure HPP piping. (This modification will facilitate a quicker pump installation next time).
10-Mar-12 06:41	SLB back up on with (new) HPP #2
10-Mar-12 07:29	Switched suction to upright tank #2 and returns to tank #1.
10-Mar-12 08:55	EXPRO dropping WHP, flow starting.
10-Mar-12 08:55	Choke full open. Controlling well with back pressure valve.
10-Mar-12 08:55	Decreased WHP by 50 psi quickly to create a surge across screens.
10-Mar-12 09:12	Isotube collected, likely not good as flow just began.
10-Mar-12 11:59	The bottom and middles gauges are not responding like the top gauges to decrease in WHP.
10-Mar-12 13:29	Switched suction to upright tank #1 and returns to tank #2.

10-Mar-12 13:30	Liquid level control valve on EXPRO separator washed out. Caught early when only a drip. Well shut in and flowline from wellhead to separator blown down with N2. Work commences on swapping out the washed out valve with a similar valve already bolted in-line, but not being used. This location was blinded off.
10-Mar-12 14:08	Shut master valves on tree.
10-Mar-12 14:10	SLB begins pressuring up to 200 psi at choke manifold.
10-Mar-12 14:12	Start surging N2 through liquid lines to tank farm.
10-Mar-12 17:15	Finished replacing liquid control valve.
10-Mar-12 18:36	Opening well and restarting jet pump operations. As of 2100hrs, in the previous 24hrs the well has produced 81bbls of fluid and 15.5 mscf of gas.
10-Mar-12 18:50	EXPRO choking back to control the top gauge at ~560psia, WHP climbing to >500psig and flow falling off.
10-Mar-12 18:58	Gas at surface.
10-Mar-12 19:31	Fluid at surface.
10-Mar-12 21:00	Production from 21:00-21:00: 16 mscf of gas, 25 bbl of water.
10-Mar-12 21:00	Production from 21:00-21:00: 15.5 mscf of gas, 81 bbl of water.
10-Mar-12 22:00	Gary from Halliburton unable to communicate with XPIO box, attempted to restart and disconnect from Optimation, no success.
10-Mar-12 23:00	Loss of gas flow, opening choke and increasing jet pump power fluid rate to drop BHP.
11-Mar-12 00:00	**Productioncontinued with jet pumping.**
11-Mar-12 00:00	Continuing jet pump operations. Gas ceased to flow before midnight. Lowering BHP to establish flow.
11-Mar-12 00:28	Flow re-established, climbing initially to over 70 mcfd. BHP being brought below hydrate dissociation conditions, warming seen at perfs.
11-Mar-12 01:31	Switched suction to upright tank #2 and returns to tank #1.
11-Mar-12 01:33	Jet pump power fluid pump down due to pressure build up.
11-Mar-12 01:36	Jet pump online. Pumping into and out of upright tank #1.
11-Mar-12 01:42	Suction line from upright tank #2 frozen. A heater trunk positioned to thaw it.
11-Mar-12 02:00	Move one hour ahead for day light savings time.
11-Mar-12 03:00	Change in time for day light savings.
11-Mar-12 03:50	Tried to go to upright tank #2 again. Hose still frozen.
11-Mar-12 05:35	Suction hose from upright tank #2 thawed and flowing to tank #2.
11-Mar-12 12:00	Switched suction to upright tank #1 and returns to tank #2.
11-Mar-12 14:45	Flow established and controlled at a rate of around 10 mcfd. This gas rate was selected to help maintain gas in the wellbore. Saw tooth pattern observed in BHP.
11-Mar-12 17:30	Switched suction to upright tank #2 and returns to tank #1.
11-Mar-12 19:50	Flare lit.
11-Mar-12 21:00	Production from 21:00-21:00: 12 mscf of gas, 18 bbl of water.
11-Mar-12 23:04	Switched suction to upright tank #1 and returns to tank #2.
12-Mar-12 00:00	**Production continued with jet pumping.**
12-Mar-12 00:00	Bringing down BHP. Sand production varying around 1%.
12-Mar-12 01:34	No gas flow from 01:34 till 05:15.
12-Mar-12 05:01	Switched suction to upright tank #2 and returns to tank #1.
12-Mar-12 06:40	It was concluded that steady production was desired over minimizing dissociation. More drawdown desired because it will possibly stabilize production.

12-Mar-12 06:50	Increasing and maintaining jet pump pressure to ~1900psig. Watching for the effect on BHP and any signs of cavitation.
12-Mar-12 09:00	Diverted flow into upright tank #2. Sucking out of and flowing into tank #2.
12-Mar-12 09:10	Vac truck begins sucking down upright tank #1 to 10'.
12-Mar-12 09:26	Diverted flow into upright tank #1. Sucking out of and flowing into upright tank #1.
12-Mar-12 09:29	Vac truck begins sucking down upright tank #2 to 10'.
12-Mar-12 09:40	Finish sucking down both tanks. Vac truck unhooking. 175 bbl of produced water manifested.
12-Mar-12 10:00	Diverted flow to upright tank #2. Sucking out of tank #1 and flowing into tank #2.
12-Mar-12 11:30	Tried to bring on power fluid HPP #1; it would not run. Began running at 11:57.
12-Mar-12 11:57	Started HPP #1. Currently running on both pumps.
12-Mar-12 13:00	Bringing jet pump power fluid to ~2000 psig in order to draw down the well as much as possible.
12-Mar-12 13:36	Periods of no gas ending at 14:11.
12-Mar-12 14:00	Switched suction to upright tank #2 and returns to tank #1.
12-Mar-12 15:50	Shutdown HPP #2 for oil change.
12-Mar-12 17:00	Dropping separator backpressure to slowly lower WHP.
12-Mar-12 18:00	Switched to HPP #2.
12-Mar-12 18:55	Switched to HPP #1.
12-Mar-12 19:11	Switched to HPP #2.
12-Mar-12 20:00	Working on HPP #1. Pop-off leaking with 64 psi of charge pump pressure.
12-Mar-12 21:00	Production from 21:00-21:00: 7.2 mscf of gas, 25 bbl of water.
12-Mar-12 22:00	Installed 2500 psi pop-off valve on HPP #1.
12-Mar-12 23:03	Switched suction to upright tank #1 and returns to tank #2.
13-Mar-12 00:00	**Production continued with jet pumping. Stopped production due to washed-out separator control valve.**
13-Mar-12 00:00	Continuing to bring down BHP. Controlling rate by holding surface separator pressure as low as possible. Sand production ranged from 0.1 to 3.1% with a daily average of 0.9%.
13-Mar-12 06:40	Continuous slow flow all night, asked EXPRO to lower WHP to 100 psig.
13-Mar-12 08:35	Attempt to switch tanks. SLB suction hose to upright tank #2 plugged.
13-Mar-12 08:58	Pumping out of upright tank #1 and flowing into tank #1.
13-Mar-12 09:25	SLB suction line free. Pumping out of upright tank #2 and flowing into tank #1.
13-Mar-12 10:39	EXPRO bypassed small back pressure valve in order to allow for higher flows at lower WHP.
13-Mar-12 17:31	Pumping out of upright tank #1 and flowing into tank #2.
13-Mar-12 19:00	Problem with GC calibration. All values are now measured higher than previous calibration, reran standards, emailed Kerry Kreiling for advice. Problem started on file "process_3-13-2012 3-20-35 PM-Rep4.
13-Mar-12 20:30	Problem with GC resolved. It was due to blockages in vent line. SLB rigged up more insulation, heat trace to prevent this problem.
13-Mar-12 20:30	Production from 20:30-20:30: 10 mscf of gas, 50 bbl of water.
13-Mar-12 20:30	EXPRO chloride numbers off last night by 1000x, correct in EXPRO files, not in database.
13-Mar-12 23:00	EXPRO cut a valve, production stopped.

13-Mar-12 23:25	Valve on EXPRO separator cut out, Schlumberger called to shut jet pump down.
13-Mar-12 23:30	Downward trend on surface pressure gauges.
13-Mar-12 23:30	A dump valve in the flow back separator line cut out assumedly due to sand production. The well was **shut in** and efforts to blow down surface lines initiated.
13-Mar-12 23:35	Blew down lines with air.
14-Mar-12 00:00	**Replaced washed out separator control valve. Production restarted.**
14-Mar-12 00:00	Blew down surface lines that contained power fluid (fresh water). One small section of riser found to be frozen at the well house door. Thawed and cleared lines.
14-Mar-12 00:00	Bled separator pressure down.
14-Mar-12 04:00	Drafted procedure to displace IA to 60/40 TriTherm (glycol). Took on 200 gal of liquid N2.
14-Mar-12 07:00	Begin rerouting liquid lines on separator to eliminate 2" sweep elbows.
14-Mar-12 07:00	Walked lines and gathered necessary equipment. Broke glycol line at EXPRO stack-pack bath. Added tubing with valves to facilitate blow down. Lined up lines to be able to take suction from the 125 bbl glycol tank to deliver high pressure fluid to the heater string and returns from the IA to the 70 bbl sand jet tank. Vac truck on location.
14-Mar-12 07:00	Shot tubing fluid level 703' @ 275 psig. Pressured up tubing with N2 to 700 psig, IA at 60 psig. Re shot fluid level at 775' (at 700 psig). After 10 minutes, WHP: 680 psig, IA = 260 psig.
14-Mar-12 11:00	Loaded IA with glycol at 1585 psig and 15 gpm taking power fluid returns to the 70 bbl sand jet tank. Manifested 25 bbl of produced water.
14-Mar-12 13:00	Rebuild liquid turbine meter on water leg.
14-Mar-12 14:00	Circulating the IA with heated glycol (929 psig and 16 gpm, inlet temp: 105°F).
15-Mar-12 00:00	**Completed replacement of washed out valve. Started production with jet pumping.**
15-Mar-12 00:00	Circulating the IA with heated glycol.
15-Mar-12 09:00	EXPRO has not been collecting water samples. They will begin collecting 2 per day.
15-Mar-12 10:18	SLB started cooling down N2 pump. EXPRO crew replacing washed out water dump valve.
15-Mar-12 10:30	Based on number of Isotubes remaining, increased sampling to 4/day.
15-Mar-12 10:30	Continued to cool down N2 pump. Shut in power fluid pump. Shut in heater and IA valves. Blew down soft hoses to the 125 bbl glycol tank.
15-Mar-12 11:00	EXPRO reconfigured to allow for the use or for bypass of the back pressure valve.
15-Mar-12 11:48	Pump N2 down the IA taking glycol returns up the heater string to the 125 bbl open top tank. Shut down, trapping 1151 psig N2 on the IA.
15-Mar-12 14:48	Lined up power fluid pump to load the IA with power fluid pumping down the heater string taking N2 returns to the sand jet tank.
15-Mar-12 15:12	Began flowing N2 across the well head through lines to the tanks bypassing the separator.
15-Mar-12 15:15	Isolated well test equipment at the wing valve.
15-Mar-12 15:48	Loaded the IA with power fluid while bleeding N2 slowly as fluid rose in the IA. Maintaining ~700 psi hydrostatic pressure at the jet pump.

15-Mar-12 18:42	Came on line with jet pump at 8 gpm. Gas returns to surface. WHP: 494 psig. Slowly working well head pressure down.
15-Mar-12 18:50	Switched suction to upright tank #2 and returns to tank #1.
15-Mar-12 18:52	**Opened well to EXPRO.**
15-Mar-12 19:13	Flare pilot lit.
15-Mar-12 20:00	Fluid at surface.
15-Mar-12 22:45	Well has been slugging since opened.
16-Mar-12 00:00	**Production continued with jet pumping.**
16-Mar-12 00:00	Slowly working well head pressure down. Gas production increased from 60-110 mscf/d during the day. Average: 90 mscf/d of gas, 180 BPD of water. Sand production varied around 2.5% all day.
16-Mar-12 02:30	Switched suction to upright tank #1 and returns to tank #2.
16-Mar-12 09:20	Loss of data from 9:18:27-9:20:32 due to a shutdown of GMS computer.
16-Mar-12 09:38	Switched suction to upright tank #2 and returns to tank #1.
16-Mar-12 13:30	Switched suction to upright tank #1 and returns to tank #2.
16-Mar-12 18:00	Switched suction to upright tank #2 and returns to tank #1.
16-Mar-12 20:28	Vac truck on location
16-Mar-12 20:30	Sucking out of tank 2, flowing into tank 2
16-Mar-12 20:31	Upright tank #1 butterfly valve broken. Had to empty tank to break connection. Additional 3" ball valve was installed with 3" camlok fitting.
16-Mar-12 20:32	Vac truck starts removing water from upright tank #1.
16-Mar-12 21:38	GC sample line frozen.
16-Mar-12 21:38	About 30 bbl of solids in upright tank #1 visually estimated following the vac truck (20 bbl remained in the upright tank, 10 bbl removed by the vac truck).
16-Mar-12 21:48	Vac truck finished. 277 bbl of water removed (280 bbl manifested).
16-Mar-12 23:00	More blockages in GC lines. GC oven door accidently opened. No GC data from ~21:30-23:00.
17-Mar-12 00:00	**Production continued with jet pumping.**
17-Mar-12 00:00	Slowly working well head pressure down. WHP went from 555 to 537 psia over the day. Sand production averaged at 2.19%.
17-Mar-12 03:00	Hydrate forming in gas line, injected Heet into line to clear blockage.
17-Mar-12 06:00	Two more incidents of GC vent line blocks overnight, SLB added a heater trunk to the GC vent line.
17-Mar-12 08:30	Power fluid pump drive set to 54% (letting pressure/rate adjust accordingly).
17-Mar-12 09:15	Diverted flow into upright tank #1. Continued to suck out of tank #2.
17-Mar-12 15:00	Pressure and rate continues to decrease on power fluid pump (except for small events) with a constant pump drive setting.
17-Mar-12 17:00	Asked SLB to let power fluid pump operate at a constant pump drive unless the pressure dropped below 1500 psig or was operating rough (low P=1500 psig, high P =2000 psig).
17-Mar-12 17:30	Note from EXPRO: The water turbine meter behavior more influenced by separator operation than flow behavior.
17-Mar-12 18:15	Switched power fluid pump (from HPP #1 to HPP #2). HPP#1 was rebuilt.
17-Mar-12 21:00	Production from 21:00-21:00: 142 mscf of gas, 148 bbl of water.
17-Mar-12 21:10	Power fluid pump running rough, switching from HPP #2 to HPP #1.
17-Mar-12 23:00	Diverted flow into upright tank #2. Continued to suck out of tank #1.
18-Mar-12 00:00	**Production continued with jet pumping. Forced shutdown due to line blockage. Flow assurance (hydrate) problem on restart.**

18-Mar-12 00:00	Jet pumping at 11 gpm and 1740 psi at the IA. Well flowing ~140 mscf/d gas. BHP (middle gauge): 533 psia.
18-Mar-12 07:30	Switched suction to upright tank #2 and returns to tank #1.
18-Mar-12 10:35	EXPRO having ice problems in the flare line. Choking back upstream of the separator until issue is resolved.
18-Mar-12 10:40	Placed heater truck and blankets at base of flare and MeOH poured down the gas line to help thaw the ice plug.
18-Mar-12 11:00	Due to ice blockage issue in the flare line, we were forced to come down on the jet pump at 11:00 and **shut the well in**. SLB shut-in and blew down surface suction and discharge lines. SLB pushed air across the tree to blow down EXPRO lines bypassing the separator.
18-Mar-12 11:18	SLB blowing down across tree to tanks to clear flow lines of fluid.
18-Mar-12 11:45	Flare line cleared of ice plug. SLB getting ready to come back on line with the power fluid pump.
18-Mar-12 11:59	Opened Upper Master. Holding pressure at the choke manifold.
18-Mar-12 12:03	Flare line blockage cleared and restarting jet pump.
18-Mar-12 12:04	Started power fluid pumping at ~ 8 gpm. Walking the jet pump rate up until a pressure of 1950 psig at the IA (~11 gpm). Well NOT flowing gas. BHP (middle gauge) responded slightly at the start of the power fluid and then started climbing slowly. Bottom gauge showed no response to changing WHP.
18-Mar-12 17:00	Switched suction to upright tank #1 and returns to tank #2.
18-Mar-12 20:00	Continuing to pump at ~11 gpm and 1950psi. Well NOT flowing gas. BHP (middle gauge) climbing slowly.
18-Mar-12 21:00	Production from 21:00-21:00: 75 mscf of gas, 57 bbl of water.
19-Mar-12 00:00	**Stopped production. Wellwork (jet pump replacement).**
19-Mar-12 00:00	Continued to pump at ~11 gpm (377 BPD) and 1950 psig. Well NOT flowing gas. BHP (middle gauge) climbing slowly.
19-Mar-12 01:30	Switched suction to upright tank #2 and returns to tank #1.
19-Mar-12 03:15	Sand trap arrived on location.
19-Mar-12 06:00	No response from bottom and middle gauges. The top gauge changing with WHP.
19-Mar-12 07:50	Lowered pumping rate to ~7gpm (240 BPD). No effect on BHP trends.
19-Mar-12 08:00	Stopping power fluid for 3 min and restarting at 2 gpm, holding WHP as constant as possible. We will try to create a "mini-surge" on restart.
19-Mar-12 08:07	SLB down on pump. Maintaining WHP with choke.
19-Mar-12 08:15	Result of "mini-surge" was no significant change to the BHP.
19-Mar-12 10:35	Slickline will bring out a new jet pump (size: 6C).
19-Mar-12 11:09	Cooling down N2 pumps. Power fluid pump shut down and shutting in the well. Blew down surface lines from well head through EXPRO, bypassing the separator to return tanks with N2. Blew down suction and hard lines to the 70 bbl sand jet tank with N2.
19-Mar-12 11:13	SLB down on pump.
19-Mar-12 11:15	Upper master shut.
19-Mar-12 11:22	EXPRO isolated at wing valve.
19-Mar-12 12:01	Pumped a total of 11932 scf N2 at 1600 psig into the tubing. Shut down with 1600 psig trapped on the tubing and 400 psig trapped on the IA. Bled the tubing to 600 psig and the IA to 0 psig.
19-Mar-12 15:03	Slick line RIH with a 3.5 dump bailer. Tagged the top of pump at 1919'. POH and made up the fishing tool string.

	RIH with jet pump fishing tool string and attempted to latch up. After ~10 tries, they were able to latch up and started hitting oil jar licks. They were unable to move pump up hole. Attempted to shear-off the jet pump for 60 minutes. Slow oil jar action, spang action not visible. Pumped 155 gal of glycol (tri-therm) down the heater string, taking returns to the tubing. Glycol should now be bathing the jet pump and Slick line tool.
19-Mar-12 16:33	Slick line able to break free, sand and silt found on tools at surface.
19-Mar-12 20:03	Slick line on surface with tools. Added lubricator and lengthened the tool string with longer spangs and more weight bars.
19-Mar-12 22:03	Made up the tool string with long spangs and thinned the oil in the oil jars. RIH. Hard time latching up again. Once latched, worked the wire with indication of good hits. Jet pump did not release. Started attempting to sheer off at 23:00. Free at 23:48. POOH and RD for night.
20-Mar-12 00:00	**Well work continues (jet pump replacement).**
20-Mar-12 00:33	Replacing the power fluid in the IA with glycol to freeze protect the well. Began pumping glycol down the heater string up the IA, taking power fluid to the 70 bbl sand jet tank.
20-Mar-12 02:29	Stopped pumping. Vac truck took 30 bbls returned power fluid from the 70 bbl sand jet tank.
20-Mar-12 02:32	Pumping glycol down the heater string taking returns from IA to 125 bbl open top tank.
20-Mar-12 07:36	Cold weather advisory for Kuparuk notification. CPA Wells Supt called to discuss. -36°F on location. Called out Slick Line (SL) unit.
20-Mar-12 08:00	Continued to circulate IA with heated glycol. Organized resources for potential Coiled Tubing (CT) intervention in case SL intervention failed to retrieve jet pump. SL on location.
20-Mar-12 09:30	SL rigged up. Cut back 200' of wire, 16' 2 5/8" stem, OJ, LSS, and stand by for 2 1/8 jars.
20-Mar-12 12:30	Cold weather advisory lifted -34°F. HES delivered 3000 gal N2. 55' lubricator, 33' tool string. PT w N2 to 700 psig RIH to pull jet pump W 4 1/2 PRS, S/D Latch @ 1919' SLM. Jar 1500-1800 for 45 minutes until pump assembly came free.
20-Mar-12 13:30	OOH w/ jet pump assy. Lock missing small piece of packing. Lay down asembly and cut 200' of wire. Drop 8' of 2 5/8" stem.
20-Mar-12 14:45	Pumped 42 gal (1 bbl) of glycol from the IA to the tubing. Glycol tank has 37-38 bbl.
20-Mar-12 14:45	RIH w/ 5'x3" pump bailer w/ Mule shoe ball. S/D @ 1932' SLM. Stroked the bailer a few times. POOH w/ metal marks on bailer bottom. Recovered a piece of packing from the lock on jet pump.
20-Mar-12 16:30	RIH w/ 3.50” centralizer, 2' stem, 3.25” centralizer, 47' x 1" prong. Stopped at 1850'. Bled WHP to 600 psig. S/D @ 1932' SLM, attempted to tap past but unable to. POOH to inspect tools. OOH small amount of sand on tools and marks on prong.
20-Mar-12 18:30	Positioned a heater on 1502 inlet line to the separator.
20-Mar-12 18:30	RIH W/ 3.25” centralizer, 2' stem, 3.50 centralizer, XO, XO, 37" prong, distance from bottom centralizer to bottom of prong = 44", S/D @ 1933' SLM, jar down attempt to bounce past. Pressure indication on WHP and BHP (top gauge) that knockout had sheared. POOH. OOH tattle tail not sheared.

20-Mar-12 19:30	RIH W/ 4 1/2" PRS, S/D @ 1932' SLM Tap down lightly. Unable to latch up. One friction bite after hand spanging held to ~ 500 lbs. POOH. OOH tool has silt on it.
20-Mar-12 20:30	RIH W/ 3.25" centralizer, 2' stem, 3.50" LIB, S/D @ 1933' SLM, Tap down POOH. Tool has silt on it and no impression.
20-Mar-12 21:00	Rigged down SL unit.
21-Mar-12 00:00	**Well work continues (jet pump replacement).**
21-Mar-12 00:00	Continued to circulate the IA with heated glycol.
21-Mar-12 04:00	Replaced pop-off on HPP #2
21-Mar-12 07:25	Installed the 0.5" Sierra thermal mass flow meter.
21-Mar-12 08:00	Pressured up tubing with N2 to 700 psig. The are 40 bbls in glycol tank (sg=1.087 corrected to 60°F).
21-Mar-12 08:15	Slick line on location. Performed pre-job, rig up (0.125 wire), 2.125" stem, TS = RS,QC,6',QC,KJ,5',QC,LSS,QC (OAL 280").
21-Mar-12 09:45	PT w/ N2 to 700 psig, RIH W/3" x 5' pump bailer, sit down @ 1932' SLM tap down work pump bailer. Work down to 1933' SLM stick bailer tap up to free tools POOH. OOH no marks, recovered 1 quart of sand.
21-Mar-12 10:45	PT w/ N2 to 850 psig.
21-Mar-12 11:15	RIH w/ 3" x 5' pump bailer, sit down @ 1932 slm. Hit down 5 times. Worked pump bailer for 30 min. Hit down 8 more times. POOH. OOH Recovered 1 quart of sand. Good metal marks from the top of the lock.
21-Mar-12 12:30	PT w N2 to 850 psig.
21-Mar-12 12:45	RIH W 3.48" centralizer, 3' X 1.875" stem, 3.61" centralizer barbell and 1 3/4" sample bailer (17"), Zero @ bottom of centralizer, sit down @ 1931' SLM. Beat down very hard. Unable to make hole. Worked tools by hand. POOH, OOH sample bailer full, no metal marks.
21-Mar-12 13:30	PT w/ N2 to 800 psig.
21-Mar-12 13:45	RIH w/ 3.48" centralizer 3' X 1.875" stem 3.61" centralizer barbell and 1 3/4" sample bailer (28"), Zero @ bottom of centralizer, sit down @ 1931' SLM. Worked tools by hand. Made 1' depth. Pulled out of lock, sat back down. Worked tools. Unable to make hole. POOH. OOH no metal marks very little sand in bailer.
21-Mar-12 14:45	PT w/ N2 to 800 psig.
21-Mar-12 15:00	RIH w/ 3.48" centralizer 3' X 1.875" stem 3.61" centralizer barbell and 1 3/4" sample bailer (17"), Zero @ bottom of centralizer, sit down @ 1932' SLM. Worked tools by hand. Worked tools down 1'. Pulled 400 over to pull free. Sat down, tapped down, made 1 foot, pulled free. POOH. OOH no metal marks. Bailer full of sand.
21-Mar-12 16:00	Add 8' 2.125" stem and PT to 800 psi W N2. RIH W 3.48" centralizer 3' X 1.875" stem 3.61" centralizer barbell and 1 3/4" sample bailer (28"), Zero @ bottom of centralizer, sit down @ 1931' SLM. Worked tools by hand to 1932.5' SLM. Tap up to free tools. Sit back down at 1931' SLM. Tap down on tools to 1932.5'. POOH, OOH no metal marks. Bailer full of sand.
21-Mar-12 17:00	PT to 800 psi W N2. RIH W 3.48" centralizer 3' X 1.875" stem 3.61" centralizer barbell and 1 3/4" sample bailer (28"), Zero @ bottom of centralizer, sit down @ 1931' SLM. Work tools to 1933' SLM. Tap up to free tools. sit back down at 1931' SLM. Tap down on tools to 1932'. POOH, OOH good metal marks. Bailer full.

21-Mar-12 18:15	PT to 800 psi W N2. RIH W 3.48" centralizer 3' X 1.875" stem 3.61" centralizer barbell and 1 3/4" sample bailer (28"), Zero @ bottom of centralizer, sit down @ 1931' SLM. Work tools by hand to 1933' SLM. Tap up to free tools. POOH, OOH good metal marks. Bailer full.
21-Mar-12 19:00	Started rigging up lines to EXPRO sand trap.
21-Mar-12 19:30	PT to 800 psi W N2. RIH W 5' x 3/4" pump bailer. Sit down at 1931' SLM. Tap down and skip past lock. Sit down@ 1934' SLM tap down and work pump. POOH. OOH with pump blue fluid and 1 quart sand.
21-Mar-12 20:45	PT to 800 psi W N2. RIH W 3.48 centralizer 3' x 1875" stem 3.61" centralizer and equalizing prong. Sit down @ 1931' SLM. Work to 1934 no pressure change until prong removed from lock and KOBE. See XPIO gauge # 2 climb 200 psi. POOH. OOH with good metal marks on prong centralizer.
21-Mar-12 21:39	Shutdown glycol pump.
21-Mar-12 21:45	Brought glycol pump online slowly to balance IA and tubing.
21-Mar-12 22:00	Little change in WHP ~800 psig. BHP (top gauge): 965 psia. Shut down SLB HPP and shut in IA returns line at the 125 bbl glycol tank. Shut down surface glycol circulation. Opened the IA to the 125 bbl open top tank, 48 bbls, checked for flow. No flow. Stepped up to 11 gpm circulating hot glycol down the heater string taking returns up the IA to the 125 bbl open top tank. SLU rigged down for the night.
21-Mar-12 22:45	Continue to circulate the IA with heated glycol.
21-Mar-12 23:30	Lines made up to sand trap and tank flushed.
22-Mar-12 00:00	**Well work continues (jet pump replacement).**
22-Mar-12 00:00	Continued to circulate the IA with heated glycol.
22-Mar-12 00:00	EXPRO cleaned the separator.
22-Mar-12 01:30	Body test done on the sand trap from choke manifold via sand trap to well head with 120 psi air.
22-Mar-12 06:45	Slick-line on location, perform pre-job, rig up (0.125 wire), 2.625" TS = RS,8',QC,KJ,LSS,QC. (OAL 210") Cut 150' of wire.
22-Mar-12 08:45	PT to 800 psi w/N2. RIH W 3.48" centralizer 3' X 1.875" stem 3.61" centralizer barbell and 1 3/4" sample bailer (28"), sit down @ 1932' SLM. Work tools by hand, work down to 1932.5 POOH OOH good metal marks on bailer. Bailer empty.
22-Mar-12 09:45	PT to 875 psi w/N2. Opened up WHP dropped to 850 psig. RIH W 4.5" PRS sit down latch Weatherford SV @ 1931' SLM. Hit 10 OJ licks & 5 spang licks Pulled SV POOH W standing VLV.
22-Mar-12 11:00	PT to 860 psi w/N2. RIH W 3" drive down bailer, sit down @ 2176' SLM / 2201' RKB tap down once POOH OOH bailer full of fluid. EXPRO wrapped sand trap in rhino hide (reinforced visqueen).
22-Mar-12 12:00	PT to 865 psi w/N2. RIH W 4.5" Z-6 & 3.75 DB lock, Weatherford seal bore assembly, and standing valve w/ball, seat, and both KOBE knockouts removed. Set lock in DB nipple @ 1913' SLM / 1957' RKB. POOH OOH W/ Z-6, tattle tail indicates good set.
22-Mar-12 13:15	PT to 860 psi W N2. RIH W 4.5" Z-6 & 3.812 DB lock & 3" RC jet pump S/N: PH-1108 ratio 6C (OAL 200") Stinger tip 1.73" ID. Sit down on stinger @ 1913' SLM tap down work past and set down at 1917' SLM set jet pump, good pull test, shear off POOH OOH tattle tail indicated lock NOT set.
22-Mar-12 13:48	Rigged up nitrogen manifold for blow down of sand trap.

22-Mar-12 14:45	PT to 860 psi W N2. RIH W 4.5" PRS sit down @ 1917' SLM. Hit 5 licks move jet pump up to 1910' SLM beat up on jet pump for 20 min. Pull jet pump free. POOH OOH. Jet pump looks good.
22-Mar-12 15:45	Redress lock, stinger looks good.
22-Mar-12 16:15	PT to 860 psi W N2. RIH W 4.5" Z-6 & 3.812 DB lock & 3" RC jet pump S/N: PH-1108 ratio 6C (OAL 200") Stinger tip 1.73" ID. Sit down on stinger @ 1913' SLM tap down work tools down and set down at 1919' SLM Beat down Z-6, good pull test, shear off, POOH OOH tattle tail indicates lock good set.
22-Mar-12 17:45	SL rigged down.
22-Mar-12 19:05	Pumping glycol to the heater bath.
22-Mar-12 19:15	Pushed 33 bbl glycol to EXPRO stack pack tank to replenish glycol used when loading the IA. 15 bbl glycol remain in the 125 bbl tank.
22-Mar-12 19:55	Finished pumping to the heater bath (~40 bbl).
22-Mar-12 20:00	Lined up N2 pump to displace the IA with N2 taking glycol returns to the 125 bbl open top tank. Returned 39 bbls of glycol to the 125 bbl open top tank. Estimated 11 bbl of glycol left in the tubing.
22-Mar-12 20:01	Switched suction to upright tank #1 and returns to tank #2.
22-Mar-12 23:24	Line up to pump N2 across the tree to EXPRO. Pressure test through sand trap to 1000 psi.
22-Mar-12 23:32	Began pressure test with N2.
22-Mar-12 23:47	Leak found at elbow upstream of EXPRO choke manifold. Pressure was bled off.
22-Mar-12 23:58	New PT, results positive.
23-Mar-12 00:00	**Wellbore flow assurance (removing hydrate blockages). Coming online for production with jet pumping.**
23-Mar-12 00:00	Blew air through surface lines in the direction of supply and back through suction to the upright tanks. Attempted to flood suction lines of the power fluid pump. Troubleshot blockage. Flooded lines, primed pumps.
23-Mar-12 00:11	Sand trap passed pressure test.
23-Mar-12 01:45	Blew down to tanks.
23-Mar-12 02:00	Rigged up to pump hot glycol to tank farm to unfreeze blocked suction line.
23-Mar-12 03:00	SLB starts to fill IA.
23-Mar-12 03:45	Filled IA with power fluid via the heater string while bleeding from the IA to the 70 bbl sand jet tank. Started at 16 gpm (795589 cum gal on meter). Raised rate to 22 gpm for 45 minutes. Reduced rate to 10 gpm, caught fluid at the sand jet tank. 25 bbl of production water manifested.
23-Mar-12 05:45	Shut down power fluid pump with a total of 1924 gal or 45.8 bbl (797513 cum gal on meter) of power fluid injected into the IA.
23-Mar-12 05:45	Lined up the power fluid pump down the IA, taking returns & production to EXPRO separator.
23-Mar-12 06:00	Rigged up and bypassed sand trap.
23-Mar-12 06:06	Opened wing valve and held pressure on choke manifold.
23-Mar-12 06:21	**Opened the well** on a 12/64 adjustable choke.
23-Mar-12 06:29	Flowing pure N2.
23-Mar-12 06:31	Opened inlet butterfly valves on both upright tanks.
23-Mar-12 07:21	Fluid to surface.
23-Mar-12 07:30	BS&W: Sand 0.25%, Glycol 99.75%.
23-Mar-12 07:34	Increased choke to 24/64.

23-Mar-12 08:30	No more glycol observed.
23-Mar-12 08:35	Increased pump rate to 14 gpm.
23-Mar-12 08:46	Slowed pump rate to 12 gpm
23-Mar-12 08:56	Slowed pump rate to 10 gpm
23-Mar-12 09:00	No fluid at surface to collect a sample.
23-Mar-12 09:28	Increased rate to 14 gpm. Held rate.
23-Mar-12 09:33	On tank swap, the supply line was frozen. Jet pumping was stopped and well shut-in to fix the blockage.
23-Mar-12 12:46	Put 1/2" LG meter in service.
23-Mar-12 13:00	Switched suction to upright tank #2 and returns to tank #1.
23-Mar-12 14:15	Started to cool down the N2 pump. Came down on the power fluid pump. Blew down all surface lines and lined up to pump heated glycol to the tubing via the heater string. Pumped 250 gal (5.95 bbl) of heated glycol down the heater string while trapping pressure on the tubing and IA. There are 46 bbl of glycol in the 125 bbl open top tank.
23-Mar-12 14:45	Pumped 7 bbls of glycol down heater stream and 128 gal of N2 down tubing (ending at 18:15).
23-Mar-12 14:47	Shut-in at choke.
23-Mar-12 14:47	SLB down on pump.
23-Mar-12 14:48	Bypassed the separator.
23-Mar-12 14:50	Shut master valve.
23-Mar-12 14:53	SLB pumping N2 across the tree to flush surface flow lines to tanks.
23-Mar-12 14:58	Shut in at choke.
23-Mar-12 14:59	SLB down on the N2 pump.
23-Mar-12 15:51	BHP (middle gauge) had a spike in pressure lasting ~2.5 minutes. DTS temperature indicated glycol close to the top of the perfs.
23-Mar-12 16:00	Pumped glycol down heater string to try to break up hydrates below the jet pump.
23-Mar-12 16:07	Shut wing valve to EXPRO.
23-Mar-12 16:09	Lined up N2 pump to the tubing, taking returns through the open pocket at 1944' to the 70 bbl bleed tank via the IA. Pumped 11,277 scf. A small amount of N2 observed at the returns tank. Shut down the pump.
23-Mar-12 16:09	Opened master valve. Pressure dropped 100 psi.
23-Mar-12 18:09	Line up HHP to IA, taking returns & production to EXPRO. Start HPP at 13 gpm and 1500 psi. Open up the well to the separator.
23-Mar-12 18:19	Stopped pumping down the IA.
23-Mar-12 18:32	Opened wing to EXPRO.
23-Mar-12 18:39	SLB up on pump.
23-Mar-12 18:39	Drew down wellhead pressure through separator.
23-Mar-12 19:42	Liquid to surface.
23-Mar-12 19:45	Draw well head to 100 psi, gas rate increased to 236 MSCFD, XPIO2 decreased to 350 psi. Shut in choke to build bottom hole pressure.
23-Mar-12 20:00	Trace of sand, 1% Glycol at separator.
23-Mar-12 20:14	BHP (middle gauge) below 400 psia.
23-Mar-12 20:14	EXPRO lit flare.
23-Mar-12 20:15	EXPRO asked to choke back pressure.
23-Mar-12 20:17	Trying to raise wellhead pressure to 300 psig by backing down on the gas metering manifold.
23-Mar-12 20:21	Attempting to stabilize rate at 490 psi. 0-150 mscf/d and slugging water.

23-Mar-12 20:22	EXPRO was trying to choke back using the backpressure valve. They were asked to get serious and choke back the flow.
23-Mar-12 20:23	Shut in at the choke.
23-Mar-12 20:27	EXPRO goes full closed on choke as BHP continues to decrease.
23-Mar-12 20:42	Fluid to surface.
23-Mar-12 21:00	Trace of sand, 1% Glycol at separator.
23-Mar-12 21:30	All glycol at separator.
23-Mar-12 23:04	Strange jump in BHPs (90 psi in one minute), jet pump power fluid pressure, temperature drop in the perfs, and rise in gas rates (45 mscf/d to 95 mscf/d in 2 minutes). Lasted about 6 minutes. Other indicators like WHP and BHTs did not show a change.
24-Mar-12 00:00	**Production continued with jet pumping.**
24-Mar-12 00:00	Well head 200-300 psi. Flow rates: ~ 50 mscf/d gas. Water consumed: 8.3 bbls. Managing flow by target BHP of 490 psia on the middle gauge. Jet pumping at 11-12 gpm (377-411 BPD) and 1000-1100 psig. Making choke adjustments throughout the day.
24-Mar-12 00:00	Trace solids at the power fluid pump inlet. Trace sand production at beginning of the day then 0% for the remainder of the day.
24-Mar-12 01:00	Switched suction to upright tank #1 and returns to tank #2.
24-Mar-12 09:36	Attempted to switch suction from upright tank #1 to #2. The surface suction line on tank #2 was blocked because of ice plug and jet pumping was temporarily down.
24-Mar-12 09:36	Switched suction to upright tank #1 and returns to tank #1.
24-Mar-12 10:45	Switched suction to upright tank #2 and returns to tank #1.
24-Mar-12 15:04	BHP (middle gauge) was staying around 510-20 psia. The target pressure is about 490 psia. Making choke adjustments.
24-Mar-12 16:00	Switched suction to upright tank #1 and returns to tank #2.
24-Mar-12 16:15	Hootched pipework and hoses in tank farm and applied heater.
24-Mar-12 23:00	Power fluid pump drive increased 1% (flow went from 11 gpm to ~11.75 gpm (377 to 403 BPD)). Predicted increase in deltaPressure across the jet pump would be about 25 psi.
25-Mar-12 00:00	**Production continued with jet pumping.**
25-Mar-12 00:00	Well head 175-160 psig. Flow rates: ~8-11 mscf/d gas. Managing flow by target pressure of 490 psia on the middle gauge, averaging 500 psia. Jet pumping at 11-12 gpm (377-412 BPD) and 1070 psig at the IA.
25-Mar-12 00:00	Trace solids at the power fluid pump inlet. Sand production at ~0% all day.
25-Mar-12 00:05	Switched suction to upright tank #2 and returns to tank #1.
25-Mar-12 01:08	Choke was increased from 15.5/64 to 16/64. BHP dropped from 500 to 495 psia.
25-Mar-12 03:00	Well head 160-150 psig. Flow rates: ~7.5-8 mscf/d gas.
25-Mar-12 05:55	Asked for an increase in the power fluid pump drive from 48% to 50%. Operator went to 51% to avoid a rough spot. BHP drop looking too big, so slowed to 49% at 06:06. Pumping 402-409 BPD, 1073-1117 psig, BHP: 505 to 483 psia.
25-Mar-12 06:00	Well head 150-250 psi. Flow rates: ~8 - 14 mscf/d gas. Managing flow by target pressure of 440 psia on the middle gauge.
25-Mar-12 07:00	Low flow thermal conductivity gas meter put into service.
25-Mar-12 07:06	Based on request from morning meeting to go to a BHP of 425 psia in two steps, the power fluid pump drive was raised from 49 to 51%.

25-Mar-12 07:16	Increasing the pump drive to 51% only resulted in a 20 psi pressure drop so the pump drive was further increased to 52%. At 52%, the pump rate was spiking wildly so the pump drive was changed to 53%.
25-Mar-12 07:37	Choke was decreased to 15.5/64 to attempt at control the middle gauge at 425 psia.
25-Mar-12 07:59	Switched suction to upright tank #1 and returns to tank #2.
25-Mar-12 09:00	Well head: 250-220 psig. Flow rates: ~15 mscf/d gas. BHP: average 435 psia. Jet pumping at 1300 psig.
25-Mar-12 12:00	Well head: 220 psig. Flow rates: ~15 mscf/d gas. BHP: average 425 psia. Jet pumping at 1317 psig.
25-Mar-12 14:30	Switched suction to upright tank #2 and returns to tank #1.
25-Mar-12 15:00	Well head: 215 psig. Flow rates: ~13 mscf/d gas. BHP: average 425 psia. Jet pumping at 1315 psig.
25-Mar-12 18:00	Flow rates: ~12 mscf/d gas. BHP: average 430 psia. Jet pumping at 1317 psig.
25-Mar-12 20:00	Production from 00:00-20:00: 9.3 mscf of gas, 8.3 bbl of water.
25-Mar-12 22:00	Switched suction to upright tank #1 and returns to tank #2.
26-Mar-12 00:00	**Production continued with jet pumping.**
26-Mar-12 00:00	Well head: 200 psig. Flow rates: ~10-11 mscf/d gas. BHP: average 430 psia. Jet pumping at 1317 psig and 11-12 gpm (377-412 BPD).
26-Mar-12 00:00	Coldest temperature in the perfs was ~35°F. Trace solids at the power fluid pump inlet. Sand production at ~0% all day.
26-Mar-12 06:00	Switched suction to upright tank #2 and returns to tank #1.
26-Mar-12 07:30	Increased power fluid pump drive from 53 to 54%, which resulted in a rate of 440-448 BPD (13 gpm) with more variation in rate than the previous setting. BHP went from 430 to 420 psia. Target is to keep BHT no cooler than 34°F.
26-Mar-12 08:37	Increased choke to 16/64 from 15.5/64. WHP dropped from 210 to 200 psig. BHP went down from 413 to 395 psia. Flow rates varying from 1-18 mscf/d gas.
26-Mar-12 10:19	Increased choke to 16.5/64, BHP went from 395 to ~375 psia.
26-Mar-12 12:24	Issue with Gas Chromatograph supply line freezing off in the GMS at the regulator. Diagnosed and fixed the problem. GC back on line (13:18).
26-Mar-12 13:18	Well head: 200 psig. Flow rates: ~17 mscf/d gas. BHP: average 377 psia. Jet pumping at 1340 psig and 13 gpm (446 BPD).
26-Mar-12 13:30	GC sample line appears to be cleared; quality measurements obtained.
26-Mar-12 13:35	Switched suction to upright tank #1 and returns to tank #2.
26-Mar-12 20:18	Jet pumping at 1340 psig. Pressure at middle gauge: 375-376 psia. Producing around 17 mscf/d gas.
26-Mar-12 20:35	Switched suction to upright tank #2 and returns to tank #1.
26-Mar-12 23:00	3 bbl of production water manifested (no record of vac truck elsewhere).
27-Mar-12 00:00	**Production continued with jet pumping.**
27-Mar-12 00:00	Well head: 200 psig. Flow rates: ~16-17 mscf/d gas. BHP: average 375 psia. Jet pumping at 1336-1340 psig and 13 gpm (446 BPD).
27-Mar-12 00:00	Trace solids at the power fluid pump inlet. Sand production at ~0% all day.
27-Mar-12 03:05	Switched suction to upright tank #1 and returns to tank #2.
27-Mar-12 07:44	Attempted to increase the power fluid pump drive from 54 to 55%. The pump flow rate was unstable and the drive setting was returned to 54%.
27-Mar-12 09:38	Switched suction to upright tank #2 and returns to tank #1.

27-Mar-12 12:53	Lowered backpressure to bring WHP down from 201 to 192 psig. Choke opened from 16.5/64 to 16.75/64. BHP at the middle gauge went from 376 to 366 psia.
27-Mar-12 13:04	Opened choke to 16.75/64.
27-Mar-12 15:38	Opened choke to 17.25/64 to drop WHP. Gas rate went from 17 mscf/d to 19 mscf/d; WHP dropped from 193 to 190 psig. BHP at middle gauge dropped from 365 to 358 psia.
27-Mar-12 17:00	Switched suction to upright tank #1 and returns to tank #2.
27-Mar-12 18:40	Production from 00:00-18:40: 13 mscf of gas, 17 bbl of water.
27-Mar-12 19:58	GC data stopped being updated. Diablo GC software was stopped and restarted. First quality sample completed at 21:01.
28-Mar-12 00:00	**Production continued with jet pumping.**
28-Mar-12 00:00	Coldest temperature in the perfs was ~34.4°F. Trace solids at the power fluid pump inlet. Sand production at ~0% all day.
28-Mar-12 00:05	Switched suction to upright tank #2 and returns to tank #1.
28-Mar-12 04:17	Slug of fluid went through separator. The gas valve was shut to maintain pressure in separator, lost flare.
28-Mar-12 05:10	Flare re-lit.
28-Mar-12 06:38	Switched suction to upright tank #1 and returns to tank #2.
28-Mar-12 07:25	Opened choke from 17.25/64 to 17.75/64. BHP at the middle gauge dropped from 359 to 352 psia. The gas rate rose from 19 mscf/d to 20 mscf/d, then over the next couple of hours fell back to 19 mscf/d. Coldest point on DTS trace: 34.4°F.
28-Mar-12 10:28	Opened choke from 17.75/64 to 18.25/64. BHP at the middle gauge dropped from 351 to 344 psia. WHP dropped from 177 to 167 psig. The gas rate rose from 19 mscf/d to 20.5 mscf/d. Coldest point in perfs from DTS trace: 34.3°F.
28-Mar-12 13:02	Switched suction to upright tank #2 and returns to tank #1.
28-Mar-12 15:32	Opened choke from 18.25/64 to 18.75/64. BHP at middle gauge dropped from 345 to 342 psia. WHP dropped from 170 to 163 psig. The gas rate initially rose from 22.5 to 23.5 mscf/d but then fell back to 21 mscf/d. Coldest point in perfs from DTS trace: 34.4°F.
28-Mar-12 19:00	Production from 00:00-19:00: 16 mscf of gas, 18 bbl of water.
28-Mar-12 19:35	Switched suction to upright tank #1 and returns to tank #2.
29-Mar-12 00:00	**Production continued with jet pumping.**
29-Mar-12 00:00	Trace solids at the power fluid pump inlet. Sand production at ~0% all day.
29-Mar-12 00:31	Opened choke from 18.75/64 to 19.25/64. BHP at middle gauge dropped from 343 to 338 psia. WHP dropped from 164 to 156 psig. The gas rate initially rose from 22 to 23.5 mscf/d for about 25 minutes but then declined back to 22 mscf/d. Coldest point in perfs from DTS trace: 34.2°F.
29-Mar-12 02:05	Switched suction to upright tank #2 and returns to tank #1.
29-Mar-12 02:28	Swapped from one HPP to the other. Temporary dip in BHP pressures of about 35 psi, which resulted in a gas surge about 45 minutes later before everything returned to normal.
29-Mar-12 03:29	Interval at top of perfs dropped below 34°F, during gas surge to 25 mscf/d.
29-Mar-12 08:02	Switched suction to upright tank #1 and returns to tank #2.
29-Mar-12 13:40	Switched suction to upright tank #2 and returns to tank #1.
29-Mar-12 19:00	Switched suction to upright tank #1 and returns to tank #2.

29-Mar-12 20:00	Production from 00:00-20:00: 18 mscf of gas, 20 bbl of water.
30-Mar-12 00:00	**Production continued with jet pumping.**
30-Mar-12 00:00	Choke remained at 19.25 all day. BHP stayed between 319 and 325 psia all day. BHT measured at the middle gauge dropped from 35°F to 34.89°F which it has read for the last 6 hours. Most of the day 6 to 10 feet of the DTS string read less than 34°F with occasional periods above 34°F interspersed throughout. Generally rising gas rate from 22 mscf/d to 24.5 mscf/d.
30-Mar-12 00:05	Switched suction to upright tank #2 and returns to tank #1.
30-Mar-12 05:05	Switched suction to upright tank #1 and returns to tank #2.
30-Mar-12 06:50	The back door of GMS was opened to help cool it down. Warmer GMS temperatures were resulting in slower GC cool down times between runs. GMS temperatures (estimated from FM101, 103, and 105) reached around 70°F.
30-Mar-12 09:29	Switched suction to upright tank #2 and returns to tank #1.
30-Mar-12 13:30	Switched suction to upright tank #1 and returns to tank #2.
30-Mar-12 17:30	Switched suction to upright tank #2 and returns to tank #1.
30-Mar-12 18:30	Choke remained at 19.25 all day. BHP stayed between 319 and 325 psia all day. BHT measured at the middle gauge dropped from 35°F to 34.89°F which it has read for the last 6 hours. Most of the day 6 to 10 feet of the DTS string read less than 34°.
30-Mar-12 20:00	Production from 00:00-20:00: 20.6 mscf of gas, 20.8 bbl of water.
30-Mar-12 22:01	Switched suction to upright tank #2 and returns to tank #2.
30-Mar-12 22:30	Vac truck on location. Finished vac truck fluid removal on upright tank #1, ~120 bbl removed (127 bbl manifested).
30-Mar-12 22:34	Switched suction to upright tank #2 and returns to tank #1.
31-Mar-12 00:00	**Production continued with jet pumping.**
31-Mar-12 00:00	No events of note. Choke remained at 19.25 all day. WHP remained between 153 and 165 psig. BHP stayed between 316 and 322 psia all day. BHT measured at the middle gauge rose about 0.03°F during the day, remaining around 34.9°F. For the third day, 6 to 10 feet of the DTS string read less than 34°F with the periods above 34°F increasing in number throughout the day. Generally steady gas rate between 24 mscf/d and 25.5 mscf/d.
31-Mar-12 02:32	Switched suction to upright tank #1 and returns to tank #2.
31-Mar-12 10:00	Switched suction to upright tank #2 and returns to tank #1.
31-Mar-12 17:00	Switched suction to upright tank #1 and returns to tank #2.
31-Mar-12 20:00	Production from 00:00-20:00: 20.5 mscf of gas, 24.1 bbl of water.
31-Mar-12 23:34	Switched suction to upright tank #2 and returns to tank #1.
01-Apr-12 00:00	**Production continued with jet pumping.**
01-Apr-12 00:00	No events of note. Choke remained at 19.25 all day. WHP remained between 153 and 165 psig, and BHP stayed between 316 and 322 psia all day. BHT measured at the middle gauge rose about 0.03°F during the day, remaining around 34.9°F. For the third day, 6 to 10 feet of the DTS string read less than 34°F with the periods above 34°F increasing in number throughout the day. Generally, the gas rate was steady between 24 mscf/d and 25.5 mscf/d. Sand production at ~0% all day.
01-Apr-12 06:18	The back door of GMS was opened to help cool it down. Warmer GMS temperatures were resulting in slower GC cool down times between runs. GMS temperatures (estimated from FM101, 103, and 105) reached between 75-80°F.

01-Apr-12 06:30	Switched suction to upright tank #1 and returns to tank #2.
01-Apr-12 12:30	Switched suction to upright tank #2 and returns to tank #1.
01-Apr-12 18:00	Switched suction to upright tank #1 and returns to tank #2.
01-Apr-12 20:00	Production from 00:00-20:00: 20.6 mscf of gas, 23 bbl of water.
01-Apr-12 23:30	Switched suction to upright tank #2 and returns to tank #1.
02-Apr-12 00:00	**Production continued with jet pumping.**
02-Apr-12 00:00	Gas mass flow rates continued to be very smooth. Choke remained at 19.25 all day. WHP remained between 151 and 164 psig, and BHP stayed between 316 and 321 psia all day. BHT measured at the middle gauge rose about 0.02°F during the day, remaining around 34.9°F. For the fourth day, 6 to 10 feet of the DTS string read less than 34°F in the evening with this interval being slightly above 34°F most of the time from 00:00 to 10:00. The gas rate was generally steady between 23.8 mscf/d and 25.4 mscf/d. Sand production ~0% all day.
02-Apr-12 00:00	The number of variations in GC total measured percentage (e.g. CH4 swinging between 94 and 101%) continued to rise today. This continues to cause some error in the computed "corrected" gas rate presented in InterACT™ (about 2-3%). GC variations caused by auto-integration errors (this will be corrected in post-processing).
02-Apr-12 05:00	Switched suction to upright tank #1 and returns to tank #2.
02-Apr-12 10:30	Switched suction to upright tank #2 and returns to tank #1.
02-Apr-12 15:30	Switched suction to upright tank #1 and returns to tank #2.
02-Apr-12 20:00	Switched suction to upright tank #2 and returns to tank #1.
02-Apr-12 20:00	Production from 00:00-20:00: 20.3 mscf of gas, 24 bbl of water.
03-Apr-12 00:00	**Production continued with jet pumping.**
03-Apr-12 00:00	Choke remained at 19.25 all day. Gas rate was generally steady between 23.6 mscf/d and 24.8 mscf/d with larger variations between 04:00-10:00 with no obvious cause. WHP remained between 151 and 165 psig, and BHP stayed between 316 and 320 psia all day. BHT measured at the middle gauge rose about 0.02°F during the day ending at 34.94°F. For the fourth day, 6 to 10 feet of the DTS string near the top of the perfs read less than 34°F, now down to about once per hour, showing a very slight overall increase in temperature. Sand production at ~0% all day.
03-Apr-12 00:05	Switched suction to upright tank #1 and returns to tank #2.
03-Apr-12 04:00	Switched suction to upright tank #2 and returns to tank #1.
03-Apr-12 08:00	Switched suction to upright tank #1 and returns to tank #2.
03-Apr-12 12:00	Switched suction to upright tank #2 and returns to tank #1.
03-Apr-12 16:00	Switched suction to upright tank #1 and returns to tank #2.
03-Apr-12 20:00	Production from 00:00-20:00: 20.1 mscf of gas, 22 bbl of water.
03-Apr-12 20:00	Switched suction to upright tank #2 and returns to tank #1.
03-Apr-12 23:30	Switched suction to upright tank #1 and returns to tank #2.
04-Apr-12 00:00	**Production continued with jet pumping.**
04-Apr-12 00:00	Choke was opened and jet pump power fluid rate was increased in effort to reduce the BHT to 33°F. Sand production at ~0% all day.
04-Apr-12 02:30	Switched suction to upright tank #2 and returns to tank #1.
04-Apr-12 04:36	Switched suction to upright tank #1 and returns to tank #2.
04-Apr-12 07:00	Switched suction to upright tank #2 and returns to tank #1.
04-Apr-12 08:33	Choke was opened from 19.25 to 19.75 beans. BHP at middle gauge dropped from 318 to 315 psia; BHT dropped 0.02°F.
04-Apr-12 10:30	Switched suction to upright tank #1 and returns to tank #2.

04-Apr-12 13:20	To help estimate CO_2 losses, a pressurized water sample was collected at the power fluid charge pump (water from upright atmospheric tank).
04-Apr-12 13:30	Switched suction to upright tank #2 and returns to tank #1.
04-Apr-12 14:21	Power fluid pump drive was increased from 54 to 55%. BHP at middle gauge dropped about 7 psi, but the power fluid flow rate was very unstable.
04-Apr-12 14:29	Power fluid pump drive was increased from 55 to 56%. BHP dropped from 316 psia (before the first power fluid rate increase at 14:20) to 300 psia. Temperature dropped from 34.94 to 34.80°F in the first two hours. The power fluid flow rate rose from 450 BPD to about 465 BPD, but the rate variation went from ±5 BPD to ±60 BPD. The power fluid pressure rose from 1301 to 1452 psig.
04-Apr-12 14:40	To help estimate CO_2 losses, a gas sample obtained near water level in upright atmospheric tank.
04-Apr-12 16:00	Switched suction to upright tank #1 and returns to tank #2.
04-Apr-12 18:30	Switched suction to upright tank #2 and returns to tank #1.
04-Apr-12 20:00	Temperature still declining after jet pump rate was increased and choke was further opened. Temperature (measured by DTS at coldest point in the perfs) has dropped from about 34.2 to 33.8°F since this morning at 08:00. The gas rate rose about 3 mscf/d.
04-Apr-12 20:00	Production from 00:00-20:00: 20.2 mscf of gas, 26 bbl of water.
04-Apr-12 21:00	Switched suction to upright tank #1 and returns to tank #2.
04-Apr-12 23:30	Switched suction to upright tank #2 and returns to tank #1.
05-Apr-12 00:00	**Production continued with jet pumping.**
05-Apr-12 00:00	Continued lowering BHP in effort to reduce BHT. Sand production at ~0% all day.
05-Apr-12 02:00	Switched suction to upright tank #1 and returns to tank #2.
05-Apr-12 04:30	Switched suction to upright tank #2 and returns to tank #1.
05-Apr-12 04:50	Power fluid pump drive rate increased from 56 to 57%. BHP at the middle gauge dropped 9 psi. Power fluid rate increased from 465 to 472 BPD.
05-Apr-12 07:00	Switched suction to upright tank #1 and returns to tank #2.
05-Apr-12 09:00	Switched suction to upright tank #1 and returns to tank #1.
05-Apr-12 09:25	Vac truck on location and removed water from upright tank #2. Removed 148.33 bbl of fluid from upright tank #2 (150 bbl manifested).
05-Apr-12 10:00	Switched suction to upright tank #1 and returns to tank #2.
05-Apr-12 16:00	Switched suction to upright tank #2 and returns to tank #1.
05-Apr-12 16:47	Power fluid pump drive rate increased from 57 to 58%. BHP at the middle gauge dropped 8 psi. Power fluid rate increased from 472 to 479 BPD.
05-Apr-12 16:47	BHT at the middle gauge dropped 0.2°F and coldest point in perfs now below 34.5°F according to DTS. Gas rate rose from 26 mscf/d to 29 mscf/d.
05-Apr-12 20:00	Production from 00:00-20:00: 23 mscf of gas, 26 bbl of water.
05-Apr-12 22:33	Switched suction to upright tank #1 and returns to tank #2.
06-Apr-12 00:00	**Production continued with jet pumping.**
06-Apr-12 00:00	Continued lowering BHP in effort to reduce BHT. Sand at ~0% all day.
06-Apr-12 06:06	Power fluid pump drive was increased from 58 to 59%. BHP at the middle gauge dropped 4 psi. Power fluid rate rose from 479 to 486 BPD.
06-Apr-12 04:33	Switched suction to upright tank #2 and returns to tank #1.

06-Apr-12 10:00	Switched suction to upright tank #1 and returns to tank #2.
06-Apr-12 15:09	Changed from power fluid pump #1 to #2 keeping the pump drive at 59%. Power fluid pressure dropped from 1675 to 1650 psig but the power fluid rate only dropped from 486 to 483 BPD. BHP at the middle gauge rose from 285 to 287 psia.
06-Apr-12 16:00	Switched suction to upright tank #2 and returns to tank #1.
06-Apr-12 20:00	Production from 00:00-20:00: 25 mscf of gas, 27 bbl of water.
06-Apr-12 22:06	Switched suction to upright tank #1 and returns to tank #2.
07-Apr-12 00:00	**Production continued with jet pumping.**
07-Apr-12 00:00	Continued lowering BHP in effort to reduce BHT. Sand production at ~0% all day.
07-Apr-12 00:54	Raised jet pump power fluid drive from 59 to 60%. Power fluid rate rose from 483 to 491 BPD. BHP started at 286 psia with a power fluid pump pressure of 1690 psig.
07-Apr-12 02:02	Raised power fluid pump drive rate from 60 to 61%. Power fluid rate rose to 497 BWPD. BHP leveled off at 281 psia with a power fluid pump pressure of 1978 psig.
07-Apr-12 04:00	Switched suction to upright tank #2 and returns to tank #1.
07-Apr-12 09:00	Switched suction to upright tank #1 and returns to tank #2.
07-Apr-12 09:25	During electrical generator swap, power fluid pump rate (and pressure) temporarily dropped over 50%, but returned to normal over the next 10 minutes.
07-Apr-12 13:30	Switched suction to upright tank #2 and returns to tank #1.
07-Apr-12 18:30	Switched suction to upright tank #1 and returns to tank #2.
07-Apr-12 20:00	Production from 00:00-20:00: 25.9 mscf of gas, 29 bbl of water.
07-Apr-12 20:14	Raised power fluid pump drive rate from 61 to 62%. Power fluid rate rose from 497 to 503 BWPD and pressure rose from 1796 to 1868 psig.
07-Apr-12 23:30	Switched suction to upright tank #2 and returns to tank #1.
08-Apr-12 00:00	**Production continued with jet pumping.**
08-Apr-12 00:00	Continued lowering BHP in effort to reduce BHT. Power fluid pump rate remained at ~504 BPD all day. BHP was ~277 psia with the coolest interval (by DTS) at ~34.5°F. Sand production at ~0% all day.
08-Apr-12 04:00	Switched suction to upright tank #1 and returns to tank #2.
08-Apr-12 10:15	To help estimate CO_2 losses, 2 gas samples obtained near water level in upright atmospheric tank (using evacuated pressure bombs). Piston cylinders were used to capture water samples at the EXPRO separator water leg and the upright atmospheric tanks (at SLB power fluid charge pump). 2 water samples were collected at each location.
08-Apr-12 08:00	Switched suction to upright tank #2 and returns to tank #1.
08-Apr-12 11:00	Switched suction to upright tank #1 and returns to tank #2.
08-Apr-12 14:00	Switched suction to upright tank #2 and returns to tank #1.
08-Apr-12 17:00	Switched suction to upright tank #1 and returns to tank #2.
08-Apr-12 20:00	Production from 00:00-20:00: 26.6 mscf of gas, 27 bbl of water.
08-Apr-12 20:00	Switched suction to upright tank #2 and returns to tank #1.
08-Apr-12 21:08	EXPRO pumped nitrogen into the separator gas leg to clear the sight glass. This resulted in a big spike in N_2 concentration (measured by the GC) and an artificial increase in flow rate.
08-Apr-12 23:00	Switched suction to upright tank #1 and returns to tank #2.
09-Apr-12 00:00	**Production continued with jet pumping.**
09-Apr-12 02:00	Switched suction to upright tank #2 and returns to tank #1.

09-Apr-12 04:30	Switched suction to upright tank #1 and returns to tank #2.
09-Apr-12 06:30	From the morning operations meeting, it has been decided to go for lowest possible BHP. Sand production at ~0% all day.
09-Apr-12 07:00	Switched suction to upright tank #2 and returns to tank #1.
09-Apr-12 10:00	Switched suction to upright tank #1 and returns to tank #2.
09-Apr-12 08:40	To help estimate the amount of CO_2 lost due to absorption in the water during jet pumping, EXPRO collected triplicate water samples from upstream of the choke, the water leg of separator, and the power fluid charge pump in the GMS. Atmospheric air samples collected at each location. These samples were sent to Tom Lorenson (USGS) for analysis.
09-Apr-12 10:30	Switched suction to upright tank #1 and returns to tank #1.
09-Apr-12 10:00	Sand samples (William Winters, USGS [two 3-gal buckets] and James Howard, ConocoPhillips [one 3-gal bucket]) and Isotube samples (box 5 and box 6 [box 6 duplicate sent to Keith Hester, ConocoPhillips]) brought to Kuparuk shipping and receiving.
09-Apr-12 10:32	Vac truck on location removing fluid from upright tank #2. Finished at 10:50. Removed 119.16 bbl from upright tank #2 (119 bbl manifested).
09-Apr-12 11:00	Switched suction to upright tank #1 and returns to tank #2.
09-Apr-12 12:52	Choke set to wide open. The back pressure on separator dropped to ~25 psig. Gas flow peaked at 140 mscf/d and dropped back to 40 mscf/d.
09-Apr-12 17:00	Switched suction to upright tank #2 and returns to tank #1.
09-Apr-12 15:58	Sample loop pressure increased to take Isotube sample. This caused the well flow rate to read zero, then spike as pressure dropped. This is not a formation/tubing change.
09-Apr-12 16:10	DTS shows a temperature below 33°F at 2446'. The middle gauge temperature reading has dropped from 34.5°F to 34.2°F.
09-Apr-12 20:00	The temperature decrease has leveled off at about 34.1°F on the middle gauge. BHP has dropped from 277 psia prior to choke opening (at 12:50) to 237 psia. Wellhead pressure has dropped from 184 psig to 27 psig. Gas rate has risen from 32 to 39 mscf/d.
09-Apr-12 20:00	Production from 00:00-20:00: 29.5 mscf of gas, 35 bbl of water.
09-Apr-12 22:18	Switched suction to upright tank #1 and returns to tank #2.
09-Apr-12 23:55	Outlet gas pressure increased to take Isotube sample. This caused the well flow rate to read zero, then spike as pressure dropped. This is not a formation/tubing change.
10-Apr-12 00:00	**Production continued with jet pumping. Final full day of production.**
10-Apr-12 00:00	Initiated removal of insulation on surface lines and stick build scaffold hooches in preparation for rig down and demob of well test equipment. Gas produced steadily at ~40 mscf/d. Sand production at ~0% all day.
10-Apr-12 04:00	Switched suction to upright tank #2 and returns to tank #1.
10-Apr-12 07:45	Outlet gas pressure increased to take Isotube sample. This affected the well flow rate. This is not a formation/tubing change.
10-Apr-12 10:00	Switched suction to upright tank #1 and returns to tank #2.
10-Apr-12 13:30	Started pulling insulation (blue-board) off surface lines.
10-Apr-12 16:00	Switched suction to upright tank #2 and returns to tank #1.
10-Apr-12 16:04	Outlet gas pressure increased to take Isotube sample. This affected the well flow rate. This is not a formation/tubing change.

10-Apr-12 19:13	Changed from using EXPRO heater as the surface storage volume for glycol circulation to the 125 bbl open top tank in order to heat the glycol in open top tank in preparation for shutdown. Temperature in circulation pumps dropped to 6°F, then rose back to 65°F in the first half hour.
10-Apr-12 20:00	Production from 00:00-20:00: 33 mscf of gas, 29 bbl of water.
10-Apr-12 20:30	Switched suction to upright tank #1 and returns to tank #2.
10-Apr-12 20:31	Swapped surface glycol circulation back to EXPRO heater bath from 125 in order to warm EXPRO back up.
10-Apr-12 20:32	Rise in total concentration by GC. There was partial blockage of the outlet port. SLB put a heater back on the outlet and the totals dropped.
10-Apr-12 22:00	Switched suction to upright tank #2 and returns to tank #2.
10-Apr-12 22:02	Vac truck on location to empty upright tank #1, and a bit from upright tank #2. Vac truck removed 225.83 bbl from upright tank #1 (ended at 22:50).
10-Apr-12 22:50	Tank strap on upright tank #1 is 1'3" and believed to be all sand (25 bbl).
10-Apr-12 22:52	Vac truck removed 64.16 bbl from upright tank #2 (ended at 23:15).
10-Apr-12 22:52	Total of 290 bbl of production water manifested.
10-Apr-12 23:05	Swapped surface glycol circulation source back to the 125 bbl open top tank.
10-Apr-12 23:46	Outlet gas pressure increased to take Isotube sample. This affected the well flow rate. This is not a formation/tubing change.
10-Apr-12 23:59	Swapped jet pump power fluid source from water to glycol. Taking glycol from 125 open top tank (start reading: 1156075 gallons on FM-301).
11-Apr-12 00:00	**Production ended. Freeze protected IA, tubing, chemical injection line, and heater string from jet pump to surface. Blow down surface lines and equipment. Dispose of returns and initiate rig down procedure.**
11-Apr-12 00:35	Swapped the power fluid source to the SLB line heater bath. Lost prime and the HPP went down for 70 seconds. BHP spiked upward ~100 psi. Once pump returned to normal rate, BHP came back down over the next hour. 13 bbl had been pulled out of the 125 bbl open top tank.
11-Apr-12 01:37	Changed surface circulation to pull out of the EXPRO heater bath and into the 125 bbl open top tank.
11-Apr-12 01:52	EXPRO heater bath emptied.
11-Apr-12 02:08	A large pressure rise began on the jet pump, eventually pushing it up about 300 psi.
11-Apr-12 02:15	A large increase in gas rate observed at the separator, which pushed the wellhead pressure up from 30 to 55 psig. At 2:28, EXPRO was asked why. They said it was due to gas production….then the WHP suddenly dropped 15 psi.
11-Apr-12 02:21	Shut-in the circulation pump and swapped to the 125 bbl open top tank.
11-Apr-12 02:30	Power fluid pump drive was lowered by 1% as injection pressure reached 2010 psi.
11-Apr-12 02:40	BHP has risen 50 psi as jet pump pump pressure and WHP have risen.
11-Apr-12 03:22	Glycol observed at EXPRO separator sample port.
11-Apr-12 03:57	Choke was shut-in, Power fluid and charge pump were shut-in for 30 seconds then brought back up to 170 BPD.

11-Apr-12 04:00	Glycol at the jet pump. Increased choke setting to hold 700 psi back pressure in effort to stall jet pump and bullhead glycol into tubing / perforations. No indication on DTS temperature trace that any glycol went below the jet pump.
11-Apr-12 04:10	FM201 showing gas flow even though EXPRO said the separator outlet was fully closed. No gas flow to the GC (possible liquid in MicroMotion, more likely operator didn't have outlet closed).
11-Apr-12 04:35	Power fluid pump drive increased from 20% to 23%.
11-Apr-12 04:36	Power fluid pump drive decreased from 23% to 20%. BHP started dropping (top gauge).
11-Apr-12 04:54	Power fluid pump drive increased from 20% to 23%.
11-Apr-12 05:02	Power fluid pump drive increased from 23% to 26%.
11-Apr-12 05:09	Power fluid pump drive increased from 26% to 29%.
11-Apr-12 05:12	Power fluid pump drive increased from 29% to 32%.
11-Apr-12 05:23	Power fluid pump drive increased from 32% to 35%.
11-Apr-12 05:31	Power fluid pump drive increased from 35% to 38%.
11-Apr-12 05:53	Power fluid pump drive increased from 38% to 41%.
11-Apr-12 06:00	Pumps were shut-in to get ready to pump down flat pack strings. EXPRO maintaining WHP around 300 psig using choke.
11-Apr-12 06:15	Attempted to pump glycol down the chemical injection line. Pressured up to 2200 psi instantly. Bled line to 70 bbl sand jet tank.
11-Apr-12 06:30	Pumped 90 bbl of glycol down the heater strings.
11-Apr-12 06:47	EXPRO controlling WHP between 200-300 psig using choke.
11-Apr-12 06:49	Brought back on pumps to continue circulating down the IA and up the tubing (Pump drive at 30%).
11-Apr-12 06:56	Power fluid pump drive increased from 30% to 35%.
11-Apr-12 06:58	Power fluid pump drive increased from 35% to 40%.
11-Apr-12 07:30	Lost power fluid pump #2, switch to power fluid pump #1. Resumed displacing well with glycol at 10 gpm and 1143 psi on the IA taking returns to the EXPRO separator. Started to cool down N2 pump.
11-Apr-12 07:36	Bled chemical injection string off to sand jet tank. This caused a drop in IA pressure.
11-Apr-12 07:56	Lost prime on power fluid pump.
11-Apr-12 08:08	Started pumping again from the SLB line heater bath.
11-Apr-12 08:43	Lost prime on pump while drawing down SLB line heater bath. Out of surface glycol. **Shut in well.** Lined up to start blowing down surface lines with N2.
11-Apr-12 08:54	Blew down EXPRO lines, separator, and hoses to tanks. Blew down surface HPP lines. Down on N2. All valves on well head shut and flagged. Began rig down.
11-Apr-12 15:25	Vac truck removed water from upright tanks (275 bbl manifested).
12-Apr-12 00:00	**Continued rigging down.**
12-Apr-12 22:42	Rigged down and inventoried all SLB treating lines and stored them in the connex. Rigged down and staged all EXPRO treating lines for shipment. Turned off well site power and removed all power leads. Staged and released non-mobile equipment, heaters/light plants/ compressors. Vac truck removed glycol to empty the SLB line heater (1 bbl manifested).
13-Apr-12 00:00	**Continued rigging down.**

13-Apr-12 00:00	Removed all EXPRO treating lines and ancillary equipment from location. Notified AOGCC of pending P&A. Crane on hold until tomorrow due to rig 27 broke down in road.
14-Apr-12 00:00	**Continued rigging down.**
14-Apr-12 00:00	Removed all major well test equipment from pad less well site generators. Built temporary well head scaffolding for slickline and CT intervention.
15-Apr-12 00:00	**Continued rigging down.**
15-Apr-12 00:00	Attempted to fish jet pump. Beat up for a total of 2.5 hrs. Removed AZTAC and CPAI communications from camp. Staged well generators for back haul.
16-Apr-12 00:00	**Continued rigging down.**
16-Apr-12 00:00	Pulled dummy valve @ 1928' RKB, pulled jet pump. Pulled Weatherford seal assembly and gutted CAT SV.
17-Apr-12 00:00	**Continued rigging down.**
17-Apr-12 00:00	Disconnected XPIO data acquisition box from well.

Ice Pad, Camp Construction, SimOps Coordination

The ice pad for the 2012 operations was completed in December 2011. Pad was constructed in eleven days utilizing 1,259,370 gallons of fresh water and 603,271 gallons of ice (see Fig XX and YY). Nordic Camp # 6 was contracted from Nordic-Calista. This modular dwelling/office complex was built in Canada by Nordic-Calista last fall, transported to the North Slope late in December, 2011, r-assembled, and certified for occupancy January 19, 2012. Secondary containment (referred to as berming and/or revetment) was constructed for all tanks, vessels and external pipeways. Hand-y-Berm, an established North Slope contractor, provided this service.

Consensus guidelines governing simultaneous operations (SimOps) were established with BP Exploration Alaska, (BPXA), operator of the Prudhoe Bay Unit. Daily SimOps meeting was held at the test site as part of the SimOps management agreement between BPXA and ConocoPhillips. In addition, ConocoPhillips wellsite supervisors monitored nearby BPXA operational activities via Harmony radios.

2011-2012 CPAI Ignik Sikumi #1 Ice Pad Daily Report

Conoco Phillips Alaska — Report No. 11
Contract No. 93957.0
Peak Job #: 13004 X 0231
Report of Activities on: 12/21/2011
Report Date & Time: 12/22/2011 Thru 0600 hours

HSE **Spills:** None **Incidents:** None	
Work Performed by Peak Ignik Sikumi	Safety Meeting: Traffic safety - When approaching wide or impassable loads slow down and leave plenty of stopping distance when approaching security vehicles. Follow the established detours and wait for the load to pass. Finished construction of the Ignik Sikumi Ice Pad utilizing water from Kuparuk #5 and ice from K111. Began demob of equipment and personnel.
Work Planned by Peak Ignik Sikumi	Place delineators along the perimeter of the pad and finish demob of equipment and personnel.
Requests for Information	None
Client/Consultant Directions	
Wildlife Sightings	Red Fox
Weather Conditions @ Kuparuk **Time:** 6:30 AM	

Temp (F)	Wind Speed (mph)	Wind Chill (F)	Conditions	Phase
-17	NNE @ 8	-34	Overcast Visibility10.0 Miles	

Comments						
Peak Manpower Ignik Sikumi	**Staff:** 3			**Crew:** 26		
Observations	**North Tarn** 2	**To-date:** 2				
Upper Management Visits	**North Tarn** 0	**To-date:** 0				
Water Use Report:	Note: Water Use is reported on a separate document.					
Fuel Use: Ignik Sikumi	**Daily:** 1,760 gal		**Total To Date:** 7,544 gal			

Scope Segment	Miles to Construct	Miles Pioneered	Miles Complete	Percent Complete	Planned Comp. Date	Estimated Comp. Date
Spine Road to North Tarn						
Construct Ramp From L Pad Access Road	1 EA	N/A	N/A	100%		12/20/2011
Construct Ignik Sikumi Ice Pad	1 EA	5.7 Acres	N/A	100%		12/21/2011
Lake Access Road For Trucks		0.2				

Table 3: Ignik Sikumi #1 Icepad: Final Construction Report

Table 4: Ignik Sikumi #1 Icepad: Water Use Report

2011-2012 CPAI Ignik Sikumi Water Use Report

Charge Code:
Peak Job No. 13004 X 0231
Report of Activities: 12/20/2011
Report Date: 12/31/2011

Peak Oilfield Service Co.

Lake	Kuparuk #5		K114		K111																									
Permit No.	A2011-159																													
Date	Ice (gal)	Water (gal)	Ice (gal)	Water (gal)	Ice (gal)	Water (gal)	Ice (gal)	Water (gal)	Ice (gal)	Water (gal)	Ice (gal)	Water (gal)	Ice (gal)	Water (gal)	Ice (gal)	Water (gal)	Ice (gal)	Water (gal)	Ice (gal)	Water (gal)	Ice (gal)	Water (gal)	Ice (gal)	Water (gal)	Ice (gal)	Water (gal)	Ice (gal)	Water (gal)	Ice (gal)	Water (gal)
12/1/2011	0	0	0	0	0	0																								
12/2/2011																														
12/3/2011																														
12/4/2011																														
12/5/2011																														
12/6/2011																														
12/7/2011																														
12/8/2011																														
12/9/2011																														
12/10/2011																														
12/11/2011		7350																												
12/12/2011		31500																												
12/13/2011		115290																												
12/14/2011		126000																												
12/15/2011		196770																												
12/16/2011		173670																												
12/17/2011		127260			202,440																									
12/18/2011		169660			233,818																									
12/19/2011		122850			160,940																									
12/20/2011		189000			6,073																									
12/21/2011																														
12/22/2011																														
12/23/2011																														
12/24/2011																														
12/25/2011																														
12/26/2011																														
12/27/2011																														
12/28/2011																														
12/29/2011																														
12/30/2011																														
12/31/2011																														

Cumulative Ice (gal)																														
Permitted Ice (gal)	Combined		Combined		Combined																									
Permitted Water (gal)	3,487,130																													
Cumulative Water (gal)	1,259,370		0		603,271																									
Status	Open		Closed		Open																									

Comments:

Figure 12: Nordic-Calista Camp on Iġnik Sikumi Icepad

Oriented Perforating

Oriented perforating was completed with Schlumberger's Wireline Perforating Platform (WPP). First, the electromagnetic Completion Mapper toolstring was run (see Figure 13) with a downhole gyroscopic compass to accurately map the location of fiber-optic and electronic cables on the outside of the casing. Once cables were identified and their location affirmed, 180° phased guns were fired to optimally perforate thirty feet of casing, at 2 shots per foot, opposite the highest saturations 92243ft-2273ft, MDKB) in the Sagavanirktok "C" Sandstone. Because perforating was accomplished in a wellbore pressured-up with mixed CO2-N2 injectant, injection started upon firing of PowerJet Omega perforating guns.

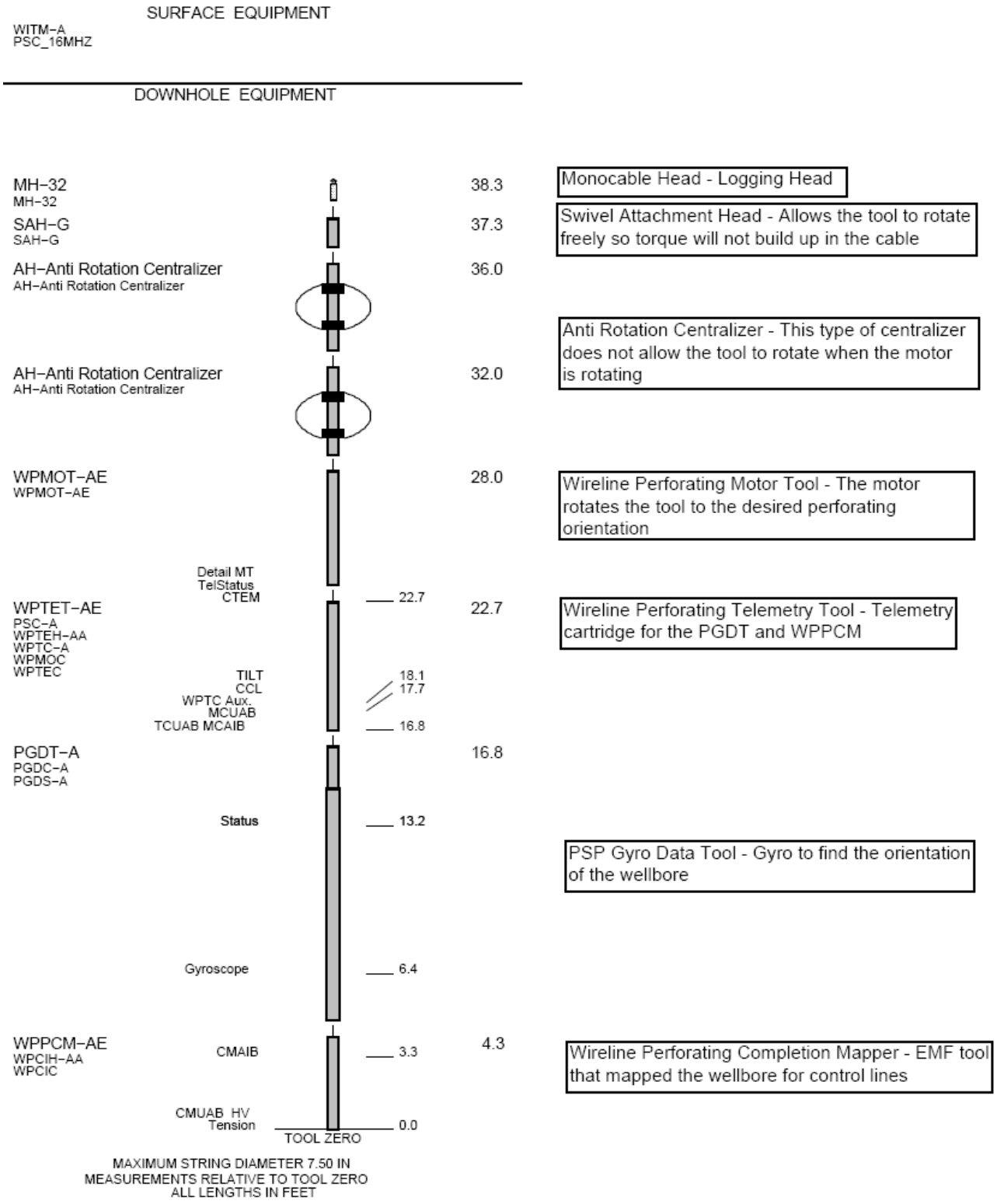
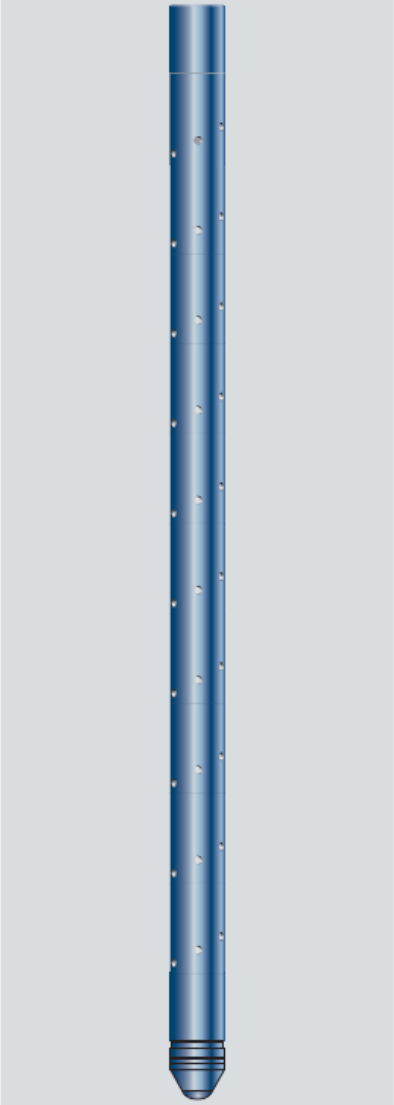


Figure 13: Schulmberger Wireline Perforating Platform (WPP)

PowerJet Omega
Deep Penetrating Shaped Charge

Schlumberger



HSD High Shot Density gun systems contain PowerJet Omega® deep-penetrating charges.*

Description

The PowerJet Omega deep penetrating shaped charge is the latest-generation shaped charge from Schlumberger and builds on the outstanding performance of the PowerJet* family of shaped charges. On the average, the PowerJet Omega shaped charge produces a 20 % increase in penetration depth compared with the performance of previous-generation shaped charges. Deeper penetration translates into increased well production and injection, coupled with improved well efficiency, which directly impact lifting costs.

The PowerJet Omega charge is currently available for 2-in to 7-in HSD gun systems. These gun systems can be conveyed by wireline, slickline, tubing-conveyed perforating (TCP), coiled tubing, tractors, and permanent completions.

The PowerJet Omega shaped charge can also be combined with underbalanced or dynamic underbalanced techniques, such as the PURE* perforating system.

Applications

- Production or injection wells
- Damaged formations
- Tight and hard rock
- All reservoir types
- All fluids (oil, water, gas)
- Reperforating old wells

Benefits

- Penetrates past formation damage, increasing well productivity or injectivity
- Maintains deep penetration at high shot density
- Intersects more natural fractures

Features

- Operates in liquid and gas according to the gun specifications
- Conveyable on wireline, slickline, TCP, coiled tubing, tractors, and permanent completions
- Compatible with all current wireline and TCP systems

Figure 14: Schlumberger PowerJet Datasheet

American Petroleum Institute (API) Test Results										Weight, Fully Loaded		
Gun Size, cm [in]	Charge	Explosive Type, Max. Weight, g	Shots Per Foot, Phasing	Penetration, cm [in]	Entrance Hole, cm [in]	Burr Average, cm [in]	Temperature Rating, 100-hr Operation, degC [degF]	Target Strength, kPa [psi]	Test Date	5-ft Gun, kg [lbm]	10-ft Gun, kg [lbm]	20-ft Gun, kg [lbm]
5.08 [2.00]	PowerJet Omega 2006	HMX, 7.3	6, 60°	55.4 [21.8]	0.6 [0.22]	0.1 [0.05]	149 [300]	43,197 [6,265]	18-Aug-04	15.4 [34]	29.5 [65]	56.7 [125]
6.35 [2.50]	PowerJet Omega 2506	HMX, 12	6, 60°	77.7 [30.6]	0.8 [0.32]	0.1 [0.04]	149 [300]	46,900 [6,802]	25-Aug-04	27.2 [60]	47.6 [105]	89.3 [197]
7.31 [2.88]	PowerJet Omega 2906	HMX, 16.0	6, 60°	91.4 [36.0]	0.9 [0.34]	0.1 [0.05]	149 [300]	40,398 [5,859]	17-Aug-04	33.1 [73]	58.0 [128]	108.4 [239]
8.08 [3.18]	PowerJet Omega 3106	HMX, 20.0	6, 60°	93.7 [36.9]	0.9 [0.34]	0.15 [0.06]	149 [300]	42,467 [6,158]	5-Jul-05	42.2 [93]	75.3 [166]	132.4 [292]
8.89 [3.50]	PowerJet Omega 3506	HMX, 27.0	6, 72°	112.3 [44.2]	1.12 [0.44]	0.15 [0.08]	149 [300]	42,439 [6,155]	18-Aug-04	57.0 [125]	95.0 [210]	172.0 [378]
10.16 [4.00]	PowerJet Omega 4005	HMX, 38.8	5, 72°	131.3 [51.7]	1.22 [0.48]	0.18 [0.07]	149 [300]	41,811 [6,064]	1-Sep-04	63.0 [140]	106.0 [234]	191.0 [421]
11.43 [4.50]	PowerJet Omega 4505	HMX, 38.8	5, 72°	150.4 [59.2]	1.10 [0.43]	0.2 [0.08]	149 [300]	43,459 [6,303]	17-Jun-04	69.8 [154]	117.0 [258]	210.9 [465]
11.43 [4.50]	PowerJet Omega 4512	HMX, 21.9	12, 135°/45°	86.4 [34.0]	0.90 [0.35]	0.15 [0.06]	149 [300]	39,923 [5,789]	20-Sep-05	75.8 [167]	128.9 [284]	234.7 [517]
17.78 [7.00]	PowerJet Omega 4505	HMX, 38.8	12, 145°/35°	135.1 [53.2]	1.10 [0.43]	0.18 [0.07]	149 [300]	37,756 [5,476]	22-Aug-05	150.2 [331]	291.4 [642]	564.7 [1,245]

Note: A certified API tester has independently verified the shaped charge performance at the Schlumberger API test site in Rosharon Texas, USA. The API Perforation Design Registration Program data are available on the API Web Site (www.api.org) for direct comparison with other shaped charges produced by the service industry

Table 5: Schulmberger PowerJet Omega Perforating Charge Specifications

Site Layout

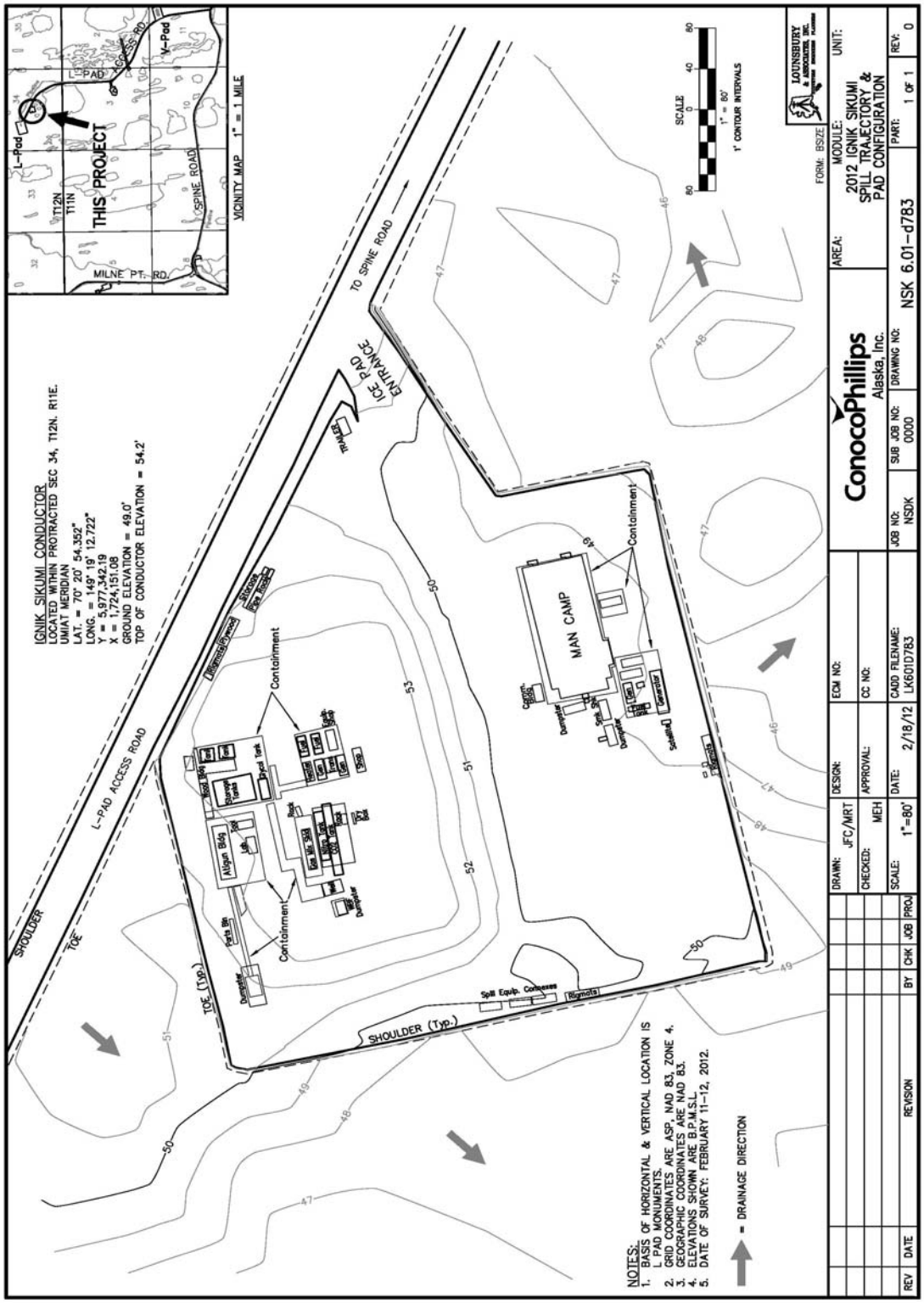


Figure 15: Iġnik Sikumi #1 Survey Plan

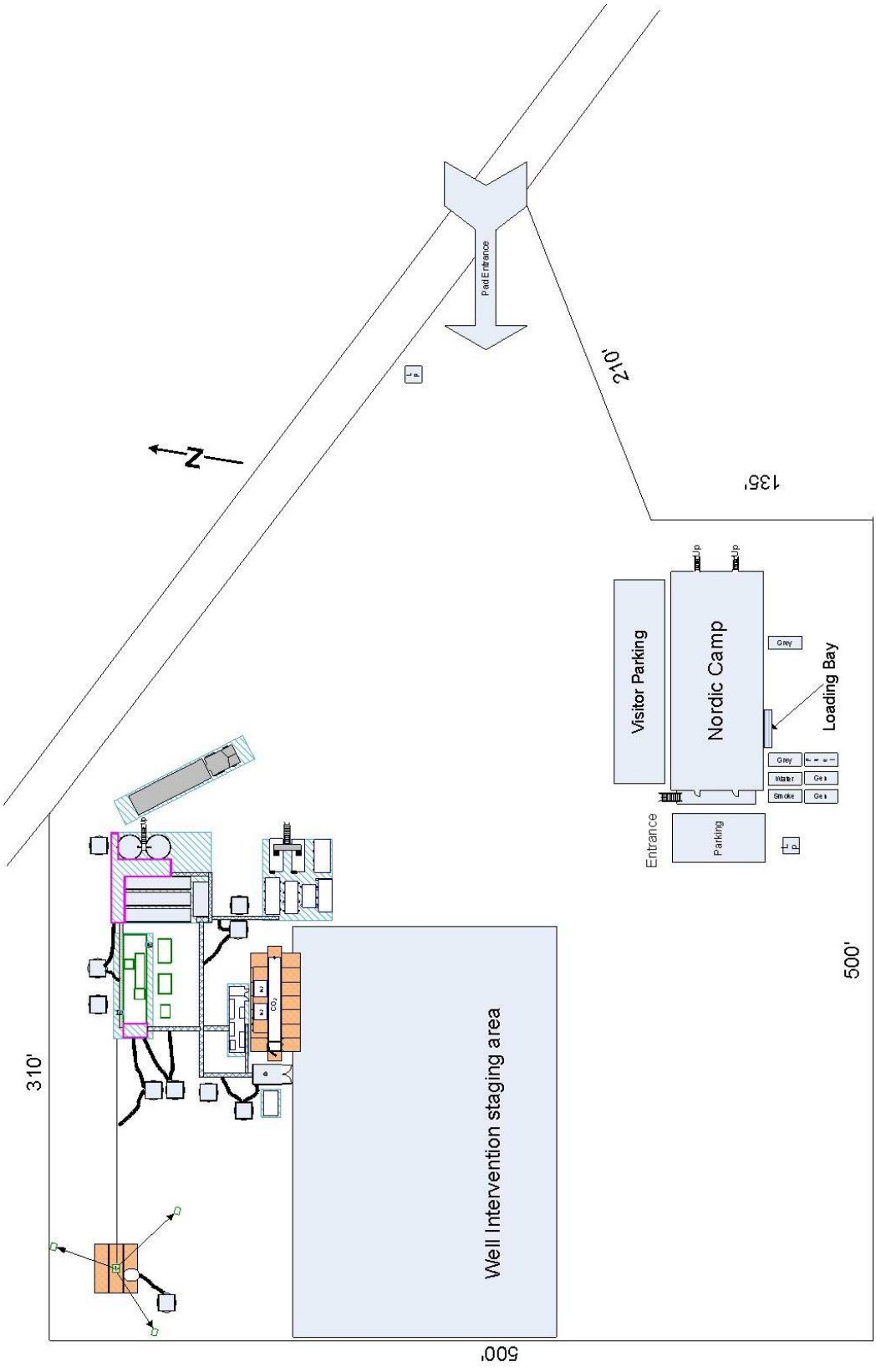


Figure 16: Ignik Sikumi #1 Ice Pad Schematic

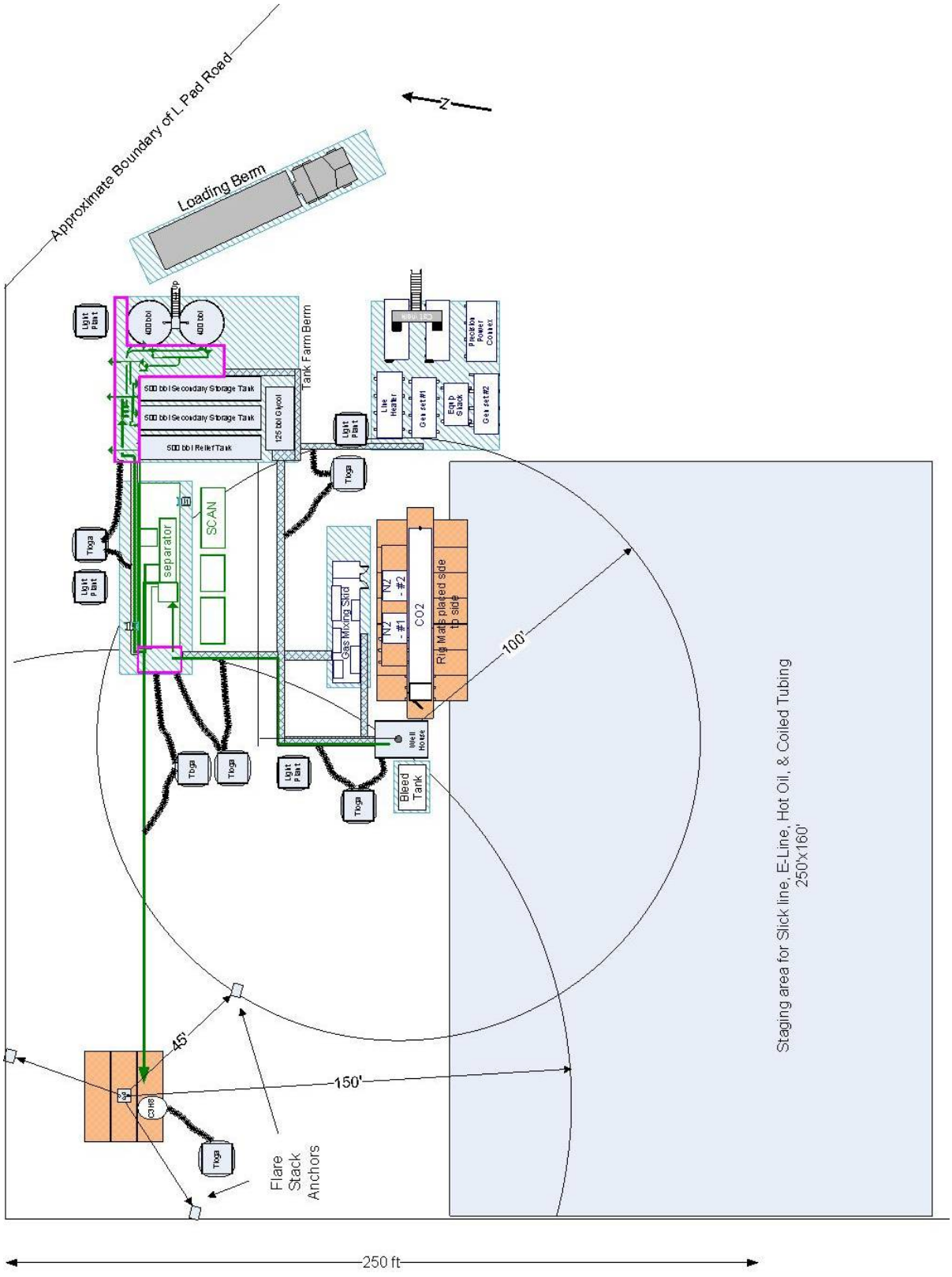


Figure 17: Ignik Sikumi #1 Well Area Schematic

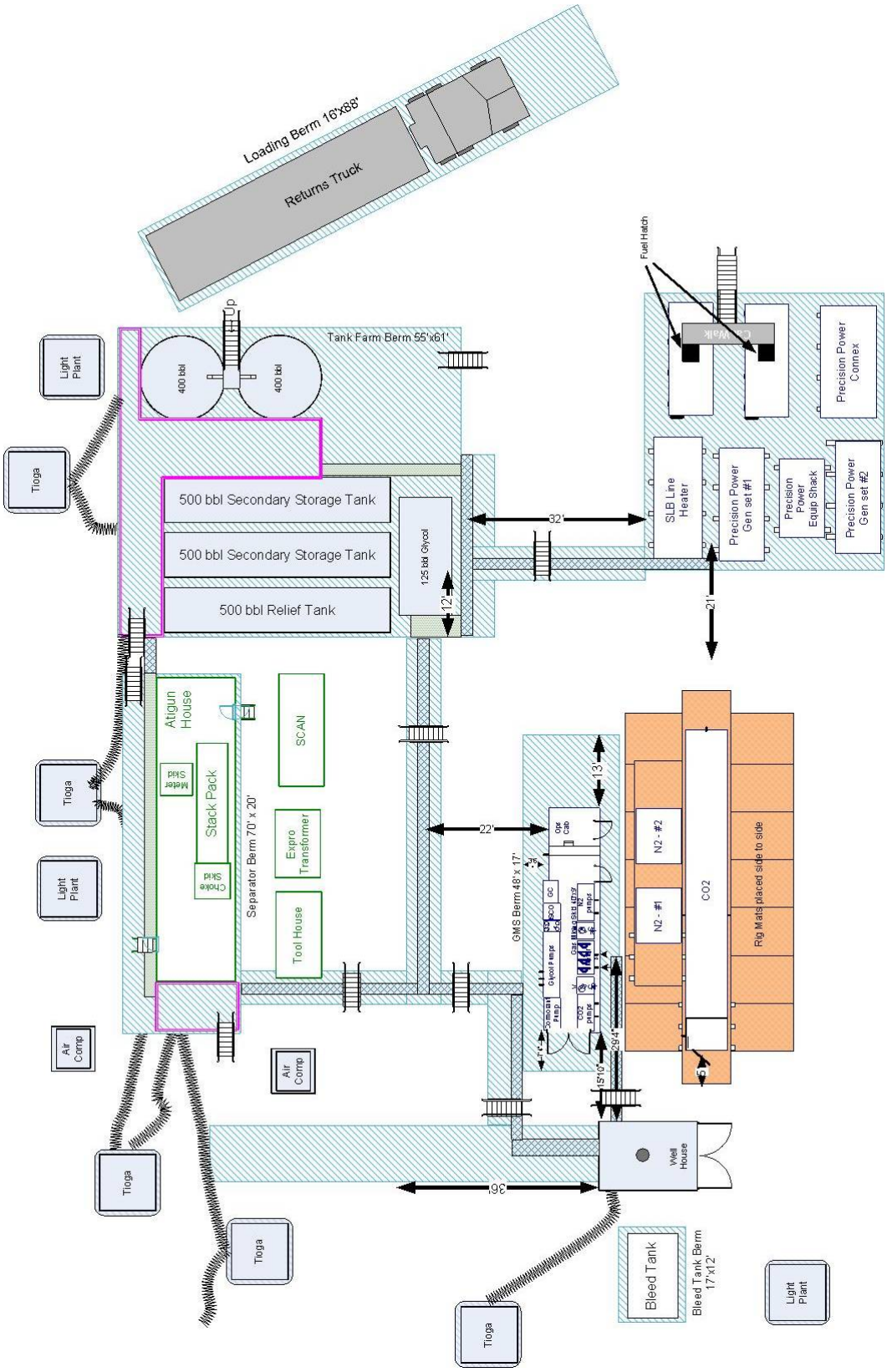


Figure 18: Ignik Sikumi #1 Surface Systems Area Schematic

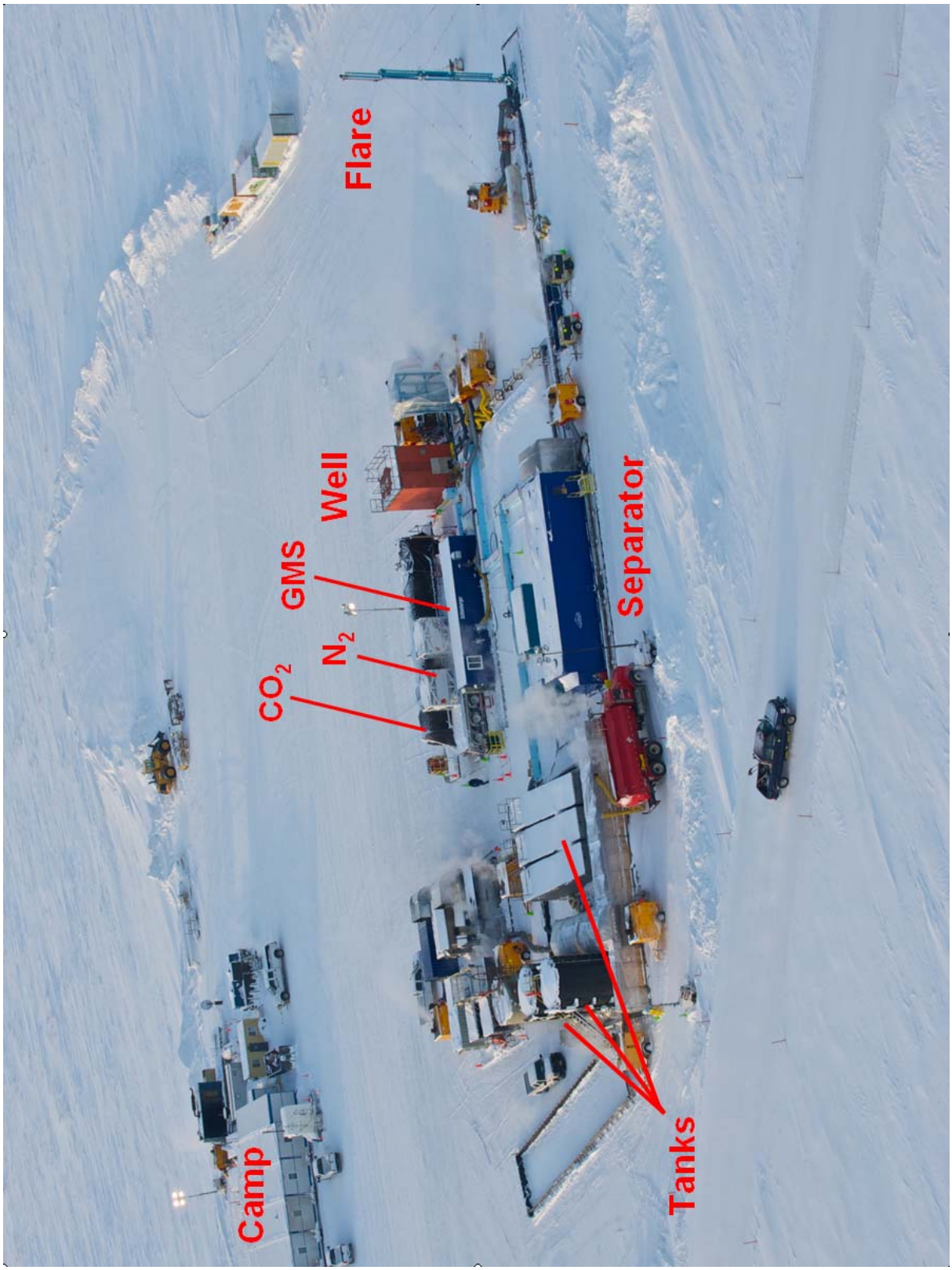


Figure 19: Iġnik Sikumi #1 Pad: Aerial Photograph

Piping and Instrumentation Diagrams (P&ID)

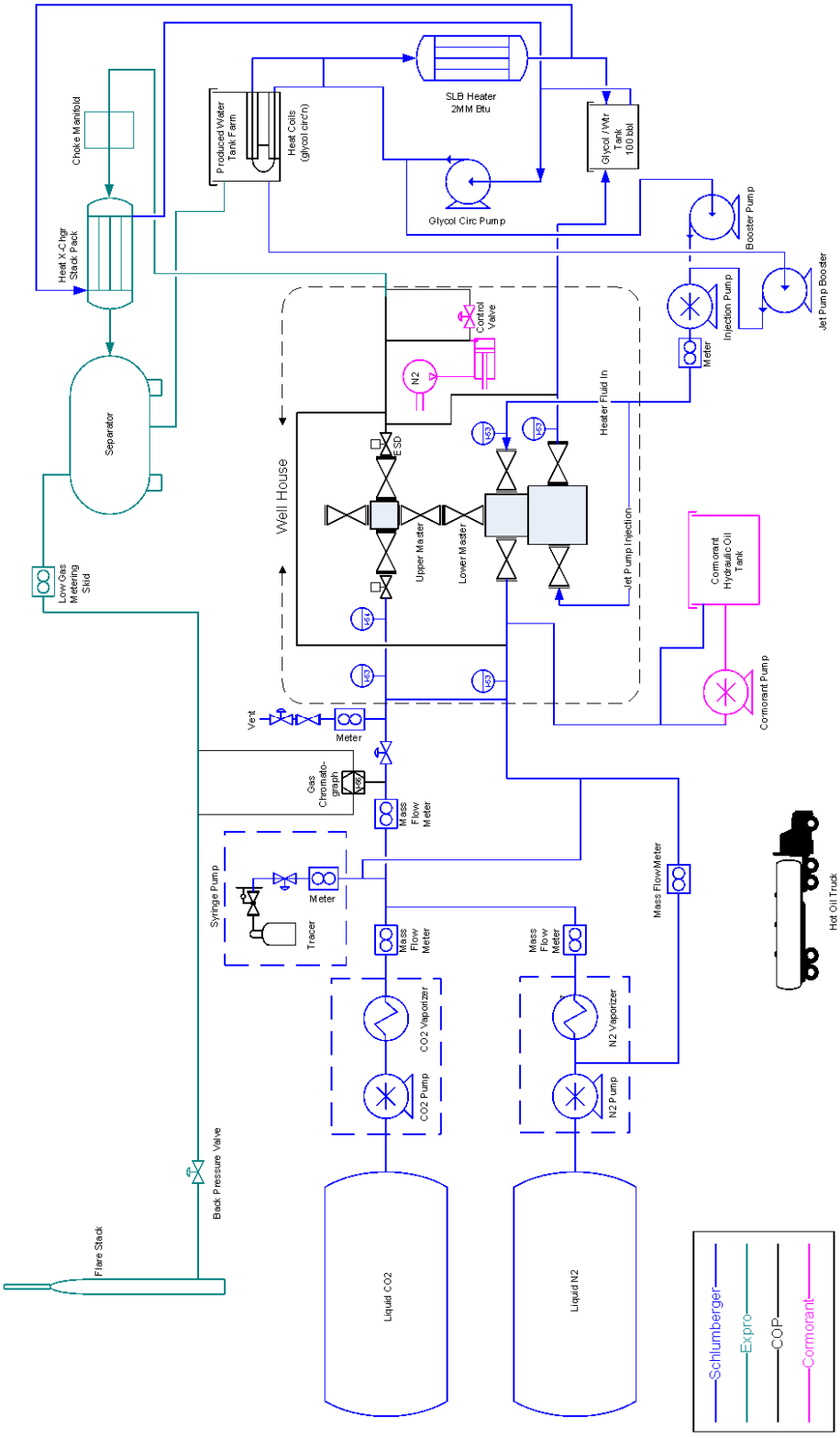


Figure 20: Simplified Project P&ID (Piping & Instrumentation Diagram)

Equipment Specifications

Gas Injection and Liquids Pumping Systems: Schlumberger

Nitrogen Tanks

Two 2000-gallon N_2 tanks were secured, then refurbished from contractor's existing inventory, prepared for this project, transported to the North Slope, spotted on Iġnik Sikumi #1 location (see Figure 21), filled with cryogenic liquid N_2 from bulk transport, and utilized throughout injection and flowback testing.

Figure 21: Spotting nitrogen tanks at Iġnik Sikumi #1

Carbon Dioxide Tank

A 50-ton CO_2 tank was purchased, then hydro-tested, refurbished, and fitted with new pipe work, valves, and pressure relief valves. Tank was subsequently transported to North Slope, spotted on Ignik Sikumi #1 location (see Figure 22), filled with cryogenic liquid CO_2 from bulk transport, and utilized throughout injection testing.

Figure 22: Spotting carbon dioxide tank at Iġnik Sikumi #1

Line Heater

Contractor provided a diesel-fired line heater to heat the glycol/water heating medium for wellbore heating. The line heater was refitted with a new control panel and burner from contractor's existing inventory, transported to North Slope, spotted on location, and utilized throughout Iġnik Sikumi injection and drawdown testing operations (see Figure 23). During the injection phase, heated glycol was circulated in the annulus via two ¾" lines in the flatpack. During production phase, heated glycol was circulated only at the surface to indirectly heat separator bath and upright tanks containing produced water (jet pump power fluid).

Figure 23: Diesel-fired Glycol/Water Heater

Pipe Work, Hoses, Valves

Various pipe work, hoses and valves were purchased and assembled, for specific use on this project, by Schlumberger. High-pressure hard lines and low-pressure hoses were assembled, pressure-tested, and enclosed in tunnels constructed of blue-board insulation (see Figures 29 and 30) Blue-board tunnels were heated by direct-fired diesel heaters.

Figure 24: Construction of high-pressure hard line on blue-board insulation base

Figure 25: View inside blue-board insulation tunnel

Data Management

Schlumberger provided data management services and electronic delivery of data via their InterACT™ website. A Well Site Data Hub (WSDH), with redundant backup, served as an on-site data concentrator for gas mixing, fluid measurement, and downhole data. Data from the WSDH was streamed to an internet server and made available to the project team and stakeholders. Following completion of the fieldtrial, the WSDH was delivered to ConocoPhillips, who is correcting the data and preparing to deliver permanent media versions to co-funding partners and key stakeholders.

Gas Mixing Skid (GMS)

Pumps, valves, meters, piping, and operator console are the main elements of the Gas Mixing Skid (see Figure 26 for GMS floorplan). Nitrogen and carbon dioxide injectants were stored on-site as cold, relatively low-pressure liquids. All fluid mixing, metering, pumping, and measurement operations on-site were coordinated by GMS operators. Separate interactive graphical interfaces (see Figures 27 and 28) controlled gas and liquid systems. Four ACD model P2K pumps were installed in GMS for pressurization of cryogenic liquids: one master and one backup, each, for nitrogen and carbon dioxide. ACD P2K pump information/specifications can be found at http://www.acdcom.com/downloads/acd_p2k.pdf

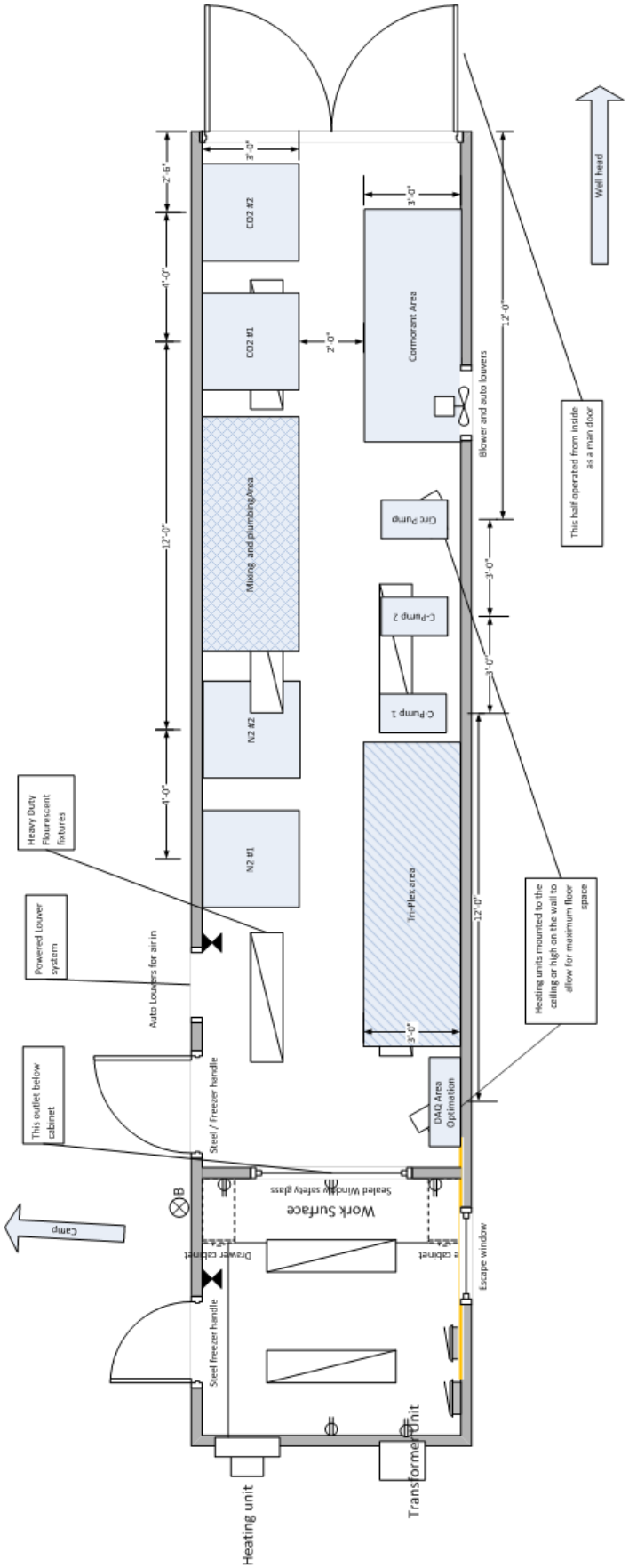


Figure 26: Schlumberger Gas Mixing Skid Floor Plan

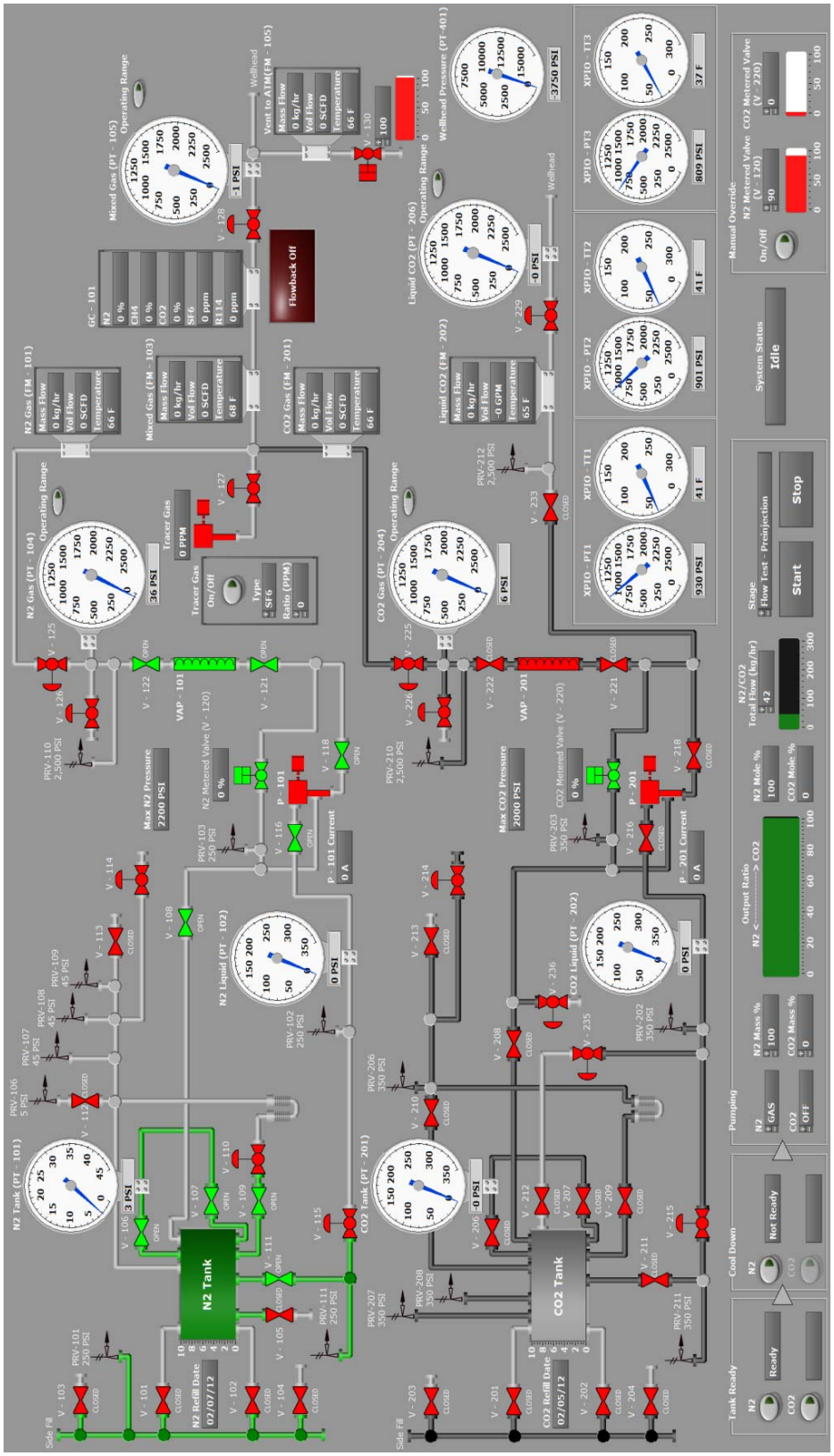


Figure 27: Cryogenic Gas Pumping Control System

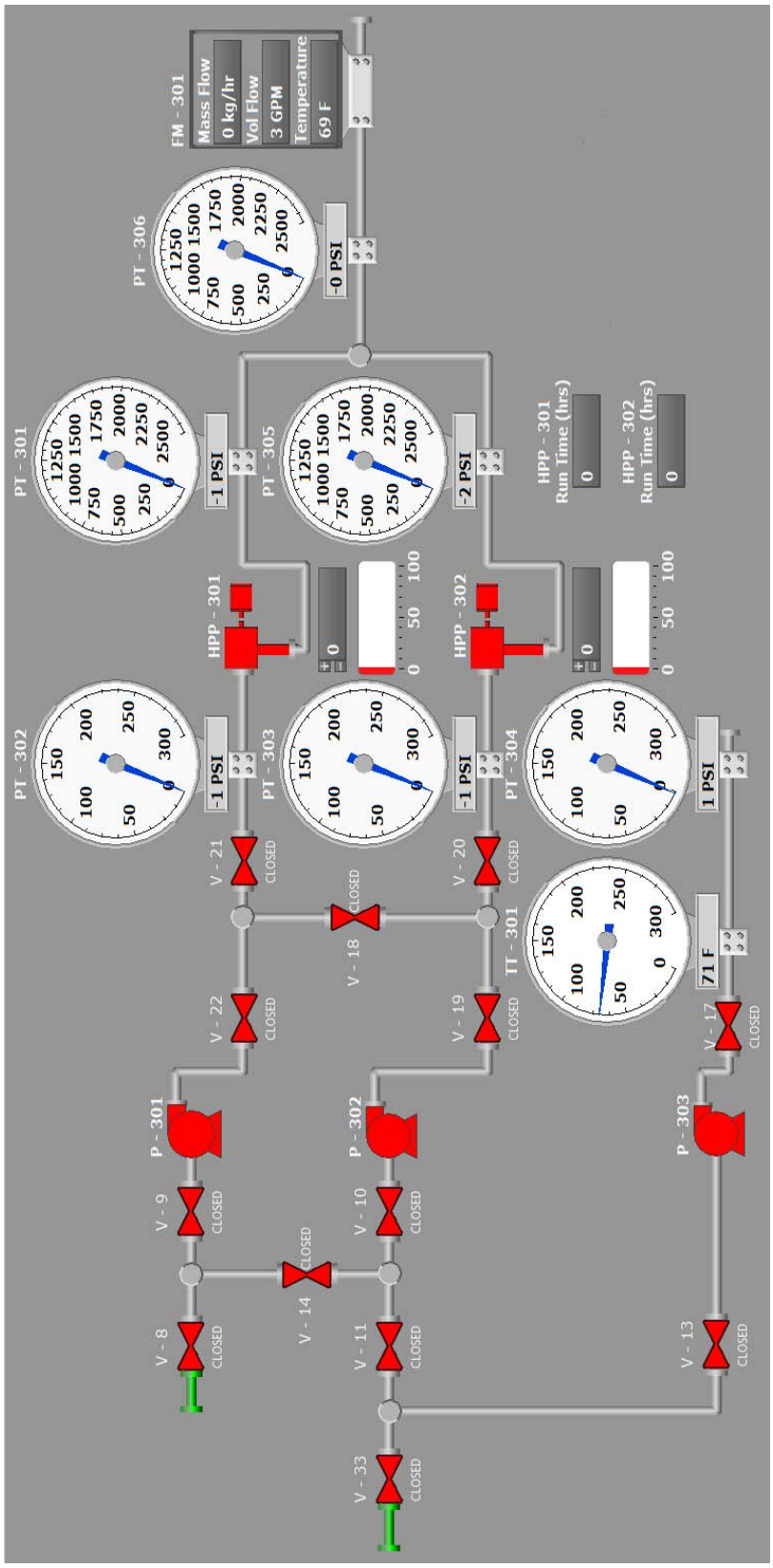


Figure 28: Liquid Pumping Control System

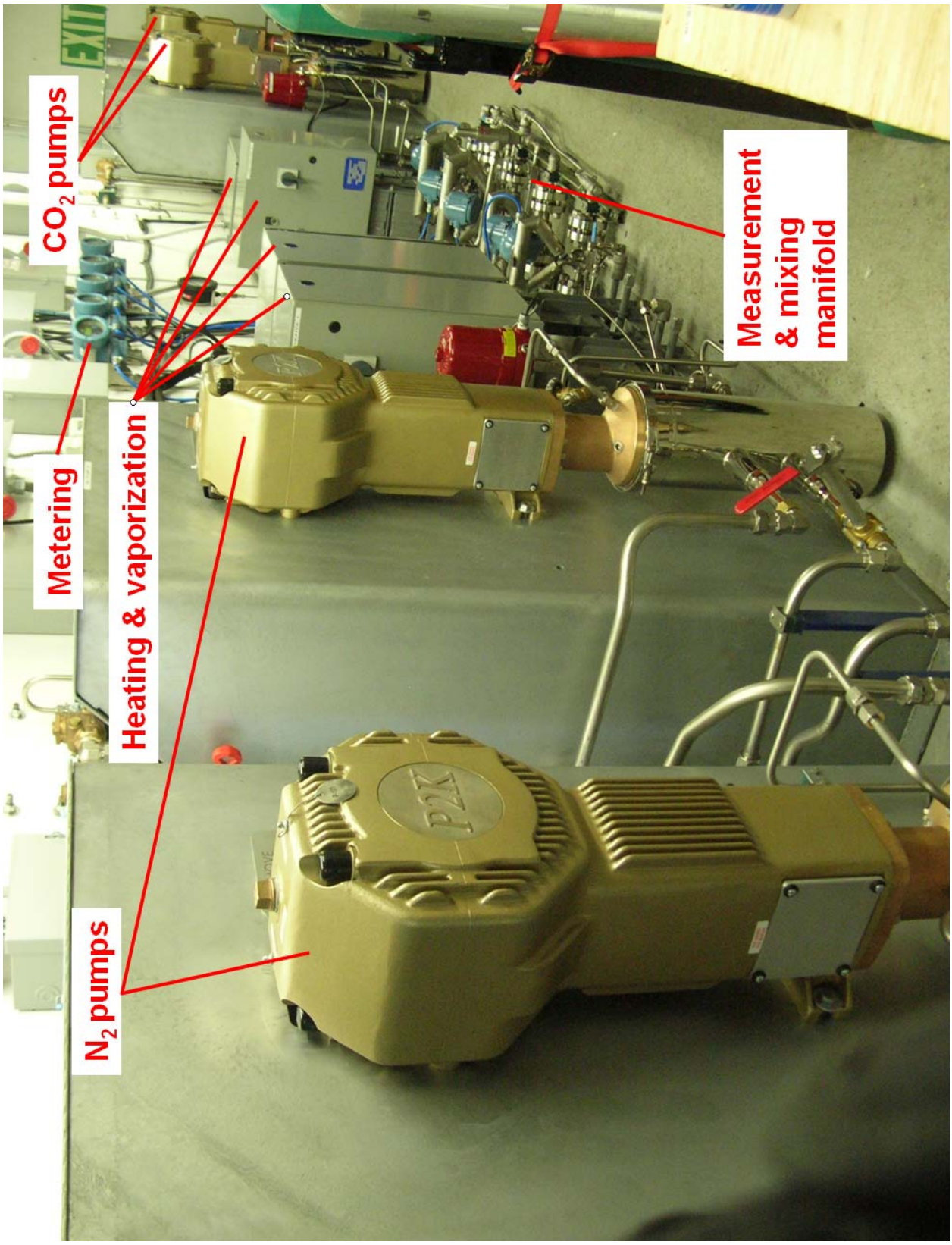


Figure 29: View Inside Gas Mixing Skid

Liquid nitrogen was stored near -300°F and 50psig; liquid carbon dioxide was stored near 0°F and 300psig. The GMS controlled pressurization, heating and vaporization to gas phase, and accurate mixing of N_2 and CO_2 injectants. The GMS also controlled liquid pumping, both of heated glycol/water mixture and produced water to power downhole jet pumps. A view inside the GMS is shown in Figure 29. The GMS was built inside a 40ft x 8ft x 8ft shipping container. The GMS was purpose-built by Schlumberger for this project, and consists of the components described in the remainder of this section.

Measurement

Independent metering in the Gas Mixing Skid provided real-time monitoring of gas and liquid flow rates. Four coriolis mass flow meters measured injected gases:

- Vendor: Micromotion
- Transmitter type: 2700R12ABAEZZZ
  - N2 and CO2 meters
    - Sensor type: CMF025HB28N2BAEZZZ
  - N2/CO2 mix meter and vent meter
    - Sensor type: CMF050HB28N2BAEZZZ

Two independent systems of liquid measurement were built into the Gas Mixing Skid, one for glycol/water measurement and one for produced and/or injected water. In addition, produced water was measured by twice-hourly tank strapping.

- Glycol/water measurement
  - One coriolis mass flow meter
    - Vendor: Micromotion
    - Transmitter type: 2700R12ABAEZZZ
    - Sensor type: CMF200MA35N2BAEZZZ
- Produced and/or injected water measurement
  - One turbine meter
    - Nuflo 1.5” turbine meter
    - Range: 500 to 6100 bbls/day
- Calibration Factor: 325 pulses/gallon Produced water measurement
  - One turbine meter
    - Nuflo 1.5” turbine meter
    - Range: 500 to 6100 bbls/day
    - Calibration Factor: 325 pulses/gallon
  - Tank strapping
    - 1/2 inch increments
    - 1” represent 1.67 bbl

Liquid Pumps

Triplex Pumps

Two 30-horsepower Giant model LP255 triplex pumps for circulating the glycol/water heating medium in the wellbore before and during gas injection were installed in the

GMS. These high-pressure pumps also supplied power fluid to the reverse-flow jet pump during drawdown testing. Pump information/specifications can be found at http://www.giantpumps.com/pumpspages/pumpmanuals/LP122A_LP123_LP255.pdf

Centrifugal Pumps

Two 5-horsepower centrifugal pumps to charge the triplex pumps were installed in the GMS, in addition to a 10-horsepower centrifugal pump to circulate the glycol/water heating medium through the Schulmberger line heater at surface. This low-pressure system pumped heater glycol/water mixture to separator bath and also to heating coils in produced-water tanks, indirectly heating jet pump powerfluid.

Process Logic & Control

Optimation was subcontracted to write the computer code for operating logic and process control, as well as data management and storage on the Well Site Data Hub (WSDH).

Data Management

Schlumberger provided data management services and electronic delivery of data via their InterACT™ website. A Well Site Data Hub (WSDH), with redundant backup, served as an on-site data concentrator for gas mixing, fluid measurement, and downhole data. Data from the WSDH was streamed to an internet server and made available to the project team and stakeholders. Following completion of the fieldtrial, the WSDH was delivered to ConocoPhillips, who is correcting the data and preparing to deliver permanent media versions to co-funding partners and key stakeholders.

Gas Chromatograph

A research-grade gas chromatograph was used to measure injection and tracer blends, as well as gas and tracer concentrations during flowback. Gas chromatograph was installed in the Gas Mixing Skid (see Figure 30).

Tracer

Two high-precision ISCO syringe pump, model E100DM, were installed in the Gas Mixing Skid to meter and inject tracer gases (SF_6, sulfur hexafluoride and R114, the refrigerant $C_2Cl_2F_4$, dichlorotetrafluoroethane) into the mixed-gas injection stream. These ISCO pumps included continuous flow electric valve system. ISCO equipment included:

1 each:	System 100DM Continuous Flow Electric Valve System; includes two Model 100DM pumps, electric valve package, and system controller
2 each:	Cylinder insulating cover for Model 100DM; recommended for flow rates below 0.05% of pump maximum
2each:	High accuracy transducer (0.1%) for Model 100DM

Additional information/specifications for ISCO pumps and controllers can be found at http://www.isco.com/products/products3.asp?PL=1051050

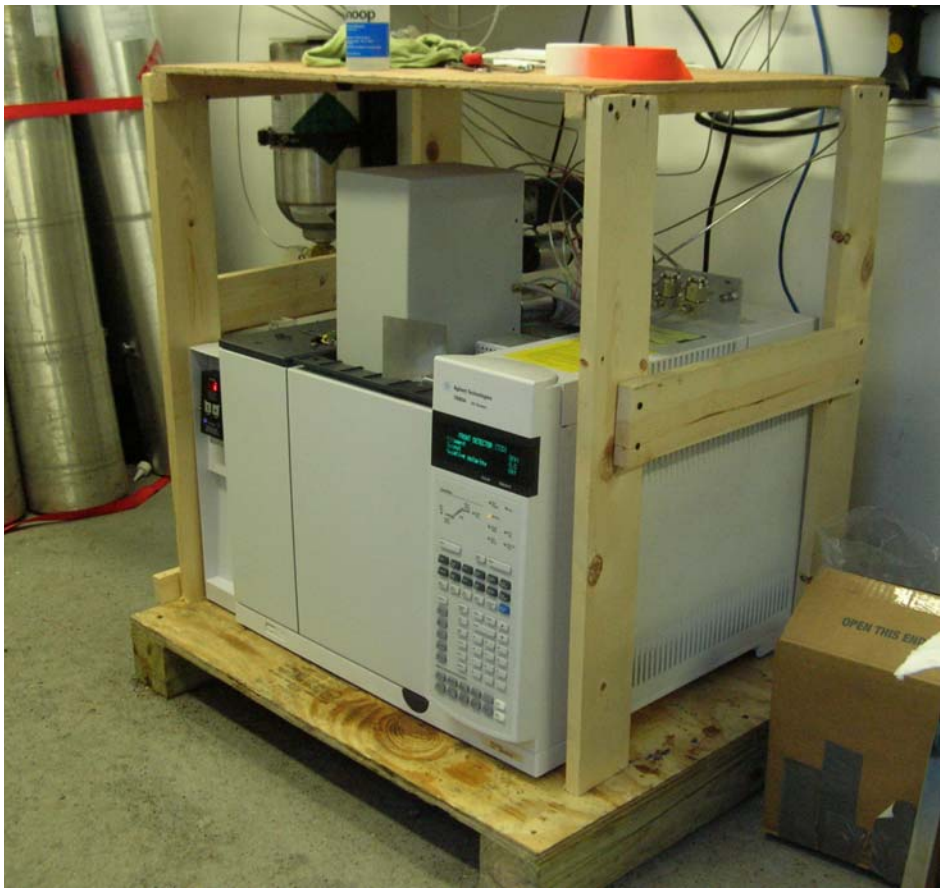


Figure 30: Gas Chromatograph Installation in Gas Mixing Skid

Gas Chromatograph specifications are as follows*:*

Agilent* Model 7890A Gas Chromatograph

i. G3440A, 7890A GC, 120V
ii. G3485A, Side Pneumatics Compartment
iii. Option 112, Split/Splitless Inlet with EPC, 2 each
iv. Option 201, 3 Channel Aux EPC
v. Option 220, TCD with EPC
vi. Option 231, ECD with EPC
vii. M8201AA, Agilent® OpenLab* for EZChrom*, Workstation Edition
viii. M8400AA, Agilent® OpenLab™ for EZChrom™ driver for Agilent GC
ix. Agilent® OpenLab™ EZChrom™ right to copy to second computer
x. Q PLOT* capillary columns

Calibration Gases:

N_2(mol%)/CH_4(mol%) /CO_2(mol%)/SF_6(ppmv)/R114(ppmv)

1. 50.1/4.99/44.91/0.9/0
2. 99.99/0/0/0/102 *
3. 0/74.9/25.1/ 0/10

*Mark of Agilent Technologies

Additional information/specifications for Agilent® Model 7890A Gas Chromatograph can be found at http://www.chem.agilent.com/Library/datasheets/Public/5989-6317EN.pdf

Process Logic & Control

Optimation was subcontracted to write the computer code for operating logic and process control, as well as data management and storage on the Well Site Data Hub (WSDH).

Data Management

Schlumberger provided data management services and electronic delivery of data via their InterACT™ website. A Well Site Data Hub (WSDH), with redundant backup, served as an on-site data concentrator for gas mixing, fluid measurement, and downhole data. Data from the WSDH was streamed to an internet server and made available to the project team and stakeholders. Following completion of the fieldtrial, the WSDH was delivered to ConocoPhillips, who is correcting the data and preparing to deliver permanent media versions to co-funding partners and key stakeholders.

Downhole Data Measurement: Pinnacle (Halliburton)

Distributed Temperature Sensor (DTS)

Encapsulated multi-mode fiber-optic cable was clamped outside the tapered 4½" x 7 ⅝" casing string and cemented in Ignik Sikumi #1 in April, 2011. Separate fiber-optic strands were dedicated to Distributed Temperature Sensors (DTS) and Distributed Acoustic Sensors (DAS). ConocoPhillips Technology purchased the fiber-optic interrogator for use on this project, independent of the Gas Hydrates Project. Ownership of this fiber-optic interrogator will remain with ConocoPhillips at the end of the project. ConocoPhillips loaned this equipment to the project. A DTS engineer was onsite during the 2012 testing operations to manage the DTS data acquisition.

Downhole P/T Gauges

ConocoPhillips Technology purchased the electronic interrogator for use on this project and retained ownership of this Halliburton/Pinnacle "Astra/XPIO"electronic interrogator. ConocoPhillips loaned this equipment to the project, and Halliburton/Pinnacle provided on-site DTS engineers during 2012 testing operations to manage the P/T gauge data in addition to the DTS data.

Distributed Acoustic Sensor (DAS)

DAS is an emerging technology. Halliburton/Pinnacle DTS Engineer, using acoustic interrogation equipment, monitored and managed acoustic data gathering during the 2012 testing. Halliburton/Pinnacle DAS expert trained DTS engineers to operate the equipment and manage the acoustic data gathering, in addition to the DTS data.

Separation/Measurement System: Expro

Winterization Shelter

A truck-transportable building was procured for winterization/enclosure of the separator and low-rate gas measurement system. Modifications were made to the enclosure and included, door latches and restraints, electrical wiring, lighting, gas detection, and alarms.

Separator

A 3-phase 1440 psig working-pressure separator was inspected, hydro-tested, installed in winterization shelter, and transported to North Slope. Other than minor upsets for washed-out dump valves, separator functioned well through over thirty days of Iğnik Sikumi #1 production testing.

Low-rate Gas Metering & Flow Control

Two thermal mass gas flow meters, designed to measure flow rates from 0 – 20 MCFPD and 20 – 300 MCFPD, were procured from contractor. A low-flow backpressure control valve controlled flow at low gas rates. This contractor-supplied equipment was mounted in the winterization shelter, described above, to comprise the LGMS (low-rate gas metering skid), and transported to the North Slope.

Three meters were employed for produced-gas measurement in the separator system: one coriolis mass-flow meter and two thermal-conductivity meters:

- Coriolis mass flow meter
  - Supplier: Micromotion
  - Transmitter type: 2700R12ABAEZZZ
  - Sensor type: CMF025HB28N2BAEZZZ
- Thermal mass flow meters (High and Low Flow)
  - Supplier: Sierra Instruments
    - Model: 780S-FM-N2-E2-P3-V4-DD-8
    - Calibrated gas: Methane
    - Range Low: 0- 20,000 SCF/day
      High: 0-300,000 SCF/day

Piping, Flare Stack, and Sand Separator

Upright sand separator, flare stack, and additional piping to plumb both into surface flow system, was provided by Expro.

Artificial Lift

Mechanical Pumps

Hydraulic-drive mechanical sucker-rod pumps were designed, built, and tested by Cormorant Engineering. These pumps were shipped to the North Slope. The chemical injection line (central line of triple flatpack) at Iġnik Sikumi #1 would not pressure-test successfully, precluding installation and drawdown testing with mechanical pumps.

Cormorant Pump Assemblies

Downhole pump assemblies were designed, built, tested, and transported to the North Slope. Comorant hydraulic pumps were planned be powered by hydraulic fluid, pumped from the surface, via the chemical injection mandrel, which was connected to central ¾" line of triple flatpack. Four Comorant pumps (two 3¼" pumps and two 2½" pumps) were transported to the North Slope.

Jet Pumps

Jet pumps, commonly used by ConocoPhillips in conventional operations on the North Slope, were built for space-out and setting opposite the gas-lift mandrel. Jet pump design criteria with examples are included below.

Jet Pump Assemblies

Reverse jet pump assemblies were machined, including two DB-6 locks and a lower seal assembly. Jet pump engineering design work was completed, and a variety of throats and nozzles have been secured to span a wide range of expected operating conditions.

Jet Pump Design: Examples

For the basis of jet pump design, intake pressure was targeted at 265 psig. Combined with hydrostatic head of a column of water to the perforations, resultant mid-perforation pressure of 400 psig was used in calculations.

Cases were run across the range of flows given as a basis of design: water rates from zero to 400 BWPD and gas rates from zero to 150 mcfd. Surface pumps installed in GMS were sized to handle all these conditions except the unlikely condition of the highest water rate and the highest gas rate combined. Under those conditions, the jet pump would not be able to provide full drawdown because high gas rates would require a large opening between the nozzle and throat and that would require a combination of higher rate and pressure from the surface pumps.

High Water Rate Case: 400 BLPD with 100 mscf/d gas (with Oilmaster "9B" Pump)

Jet pump design programs used herein were developed for jet pump applications to oil wells, so a small amount of oil is included (program will not accept "0 BOPD"), with a resultant negligible effect on head/friction calculations. Units are "American oil field."

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Page  1
               SNAP Jet Pump Module Running With Snap 2.252.497 5/17/2011

 Developed By Ryder Scott Company with funding from ConocoPhillips Alaska, Inc. 2005
 Solution Algorithm based on SPE Petroleum Engineering Handbook, Hal Petrie, 1990
 Original pump performance relationship copyright Weatherford, Hai Phan 1982

--------------------------------------------------------------------------------
---
    Title: JP Case for Hydrate Well  07-22-11
--------------------------------------------------------------------------------
-----
 1) Perforation Depth       (ft) :   2260         13) Producing GOR  (scf/STB) :   3750
 2) Pump Vertical Depth     (ft) :   1944         14) Gas Sp. Gravity (air=1.) :  0.600
 3) Pump Installation                             15) Separator Press   (psig) :   50.0
             Reverse Flow installation            16) Well Static BHP   (psig) : 1000.0
 4) Casing ID (Power Fluid) (in) :  7.025         17) Pump Intake Press (psig) :  317.0
 5) Production Tbng ID (TopSeg in): 3.958         18) Well Test Flow Rate(bpd) :  400.0
 6) N/A                                           19) Well Head Temp   (deg F) :   60.0
 7) Production Tubing OD    (in) :  4.500         20) Bottom Hole Temp (deg F) :   41.0
 8) Tubing Length           (ft) :   1944         21) Not Vented               : Not
Vented
 9) Pipe Roughness e/d   (in/in) : 0.0018         22) Power Fluid oil/water    :  Water
10) Oil Gravity            (API) : 35.000         23) Power Fluid Spec Gravity :  1.068
11) Produced Vol Water Cut (%)   :  93.30         24) Bubble Point Press(psig) :    N/A
12) Water Specific Gravity       :  1.000         25) Well Head Press   (psig) :   50.0
================================================================================
  Oilmaster  9B  Pump Performance Summary
      Target Production Rate : 400 BLPD @pump intake pressure : 317 psig
      Predicted Surface Power Fluid Injection Pressure =    882 psig
      Predicted Surface Power Fluid Injection Rate     =   1008 bpf/d
      Predicted Pump Intake Pressure                   =    317 psig
      Predicted Pump Discharge Pressure                =    508 psig
      Predicted Power Fluid Pressure at Pump depth     =   1782 psig
      Predicted Horsepower requirement                 =     19 HP
================================================================================
```

Match Prod Rate (blpd)	Rate= 389	Rate= 410	Rate= 430	Rate= 442
Match Pwr Fluid Press (psig)	PFP = 750	PFP = 1000	PFP = 1250	PFP = 1500
Match Pwr Fluid Rate (blpd)	QN = 956	QN = 1054	QN = 1142	QN = 1224
Match Pump Intake Pres(psig)	PIP = 334	PIP = 302	PIP = 275	PIP = 243
Pump Discharge Prs(psig)	PD = 504	PD = 512	PD = 519	PD = 527
Match Pwr Fld prs @pmp (psig)	PN = 1650	PN = 1900	PN = 2150	PN = 2401

PmpInPr	Qresvr	QCav	QSuctn	QNozzl	cd	QSuctn	QNozzl	cd	QSuctn	QNozzl	cd	QSuctn	QNozzl	cd
PSIG	STB/D	STB/D	STB/D	B/D		STB/D	B/D		STB/D	B/D		STB/D	B/D	
884	0	1203	9999	730	1	9999	840	1	9999	938	1	9999	1027	1
825	37	1152	9999	757	1	9999	864	1	9999	960	1	9999	1046	1
786	73	1117	9999	775	1	9999	880	1	9999	974	1	9999	1059	1
746	107	1081	9999	792	1	9999	895	1	9999	988	1	9999	1072	1
707	140	1045	9999	809	1	9999	911	1	9999	1001	1	9999	1085	1
668	172	1007	9999	826	1	9999	925	1	9999	1015	1	9999	1097	1
629	202	969	9999	842	1	9999	940	1	9999	1028	1	9999	1109	1
590	231	930	9999	858	1	9999	954	1	9999	1041	1	9999	1122	1
552	258	890	9999	874	1	9999	968	1	9999	1054	1	9999	1133	1
514	284	849	9999	889	1	9999	982	1	9999	1067	1	9999	1145	1
475	309	807	9999	904	1	9999	995	1	9999	1079	1	9999	1157	1
438	332	765	468	918	0	517	1008	0	561	1091	0	602	1168	0
400	354	720	440	932	0	487	1021	0	530	1103	0	570	1179	0
364	374	675	411	946	0	458	1034	0	500	1114	0	539	1190	0
327	393	629	383	959	0	429	1046	0	471	1126	0	509	1200	0
302	410	595	363	968	0	410	1054	0	450	1133	0	488	1208	0
284	426	570	349	975	0	396	1060	0	437	1139	0	473	1213	0
247	441	518	321	988	0	369	1072	0	409	1150	0	445	1223	0
210	455	463	292	1001	0	342	1084	0	382	1161	0	417	1234	0
174	466	404	260	1013	0	316	1096	0	356	1172	0	390	1244	0
137	477	341	220	1026	0	289	1107	0	330	1183	0	364	1254	0
99	486	267	175	1039	4	260	1119	0	302	1194	0	336	1265	0
59	494	180	76	1052	4	230	1132	0	275	1206	0	309	1276	0
22	500	80	19	1064	4	196	1143	0	252	1217	0	286	1286	0
1	505	0	0	1071	4	171	1149	0	239	1222	0	273	1291	0
Maximum HP Required			HP = 16			HP = 22			HP = 30			HP = 38		

Successful Codes (cd): 0 = normal JP operation, 1 = Well flowing, 2 = Pump stalling
Failure Codes : 3 = could not find operating point, 4 Function diverges from solution:min error given

The figure below summarizes graphically the model outputs listed above. Jet pump performance is predicted by intersecting any of the four jet pump pressure lines with the inflow performance line. Operations in the red hatched area are inadvisable

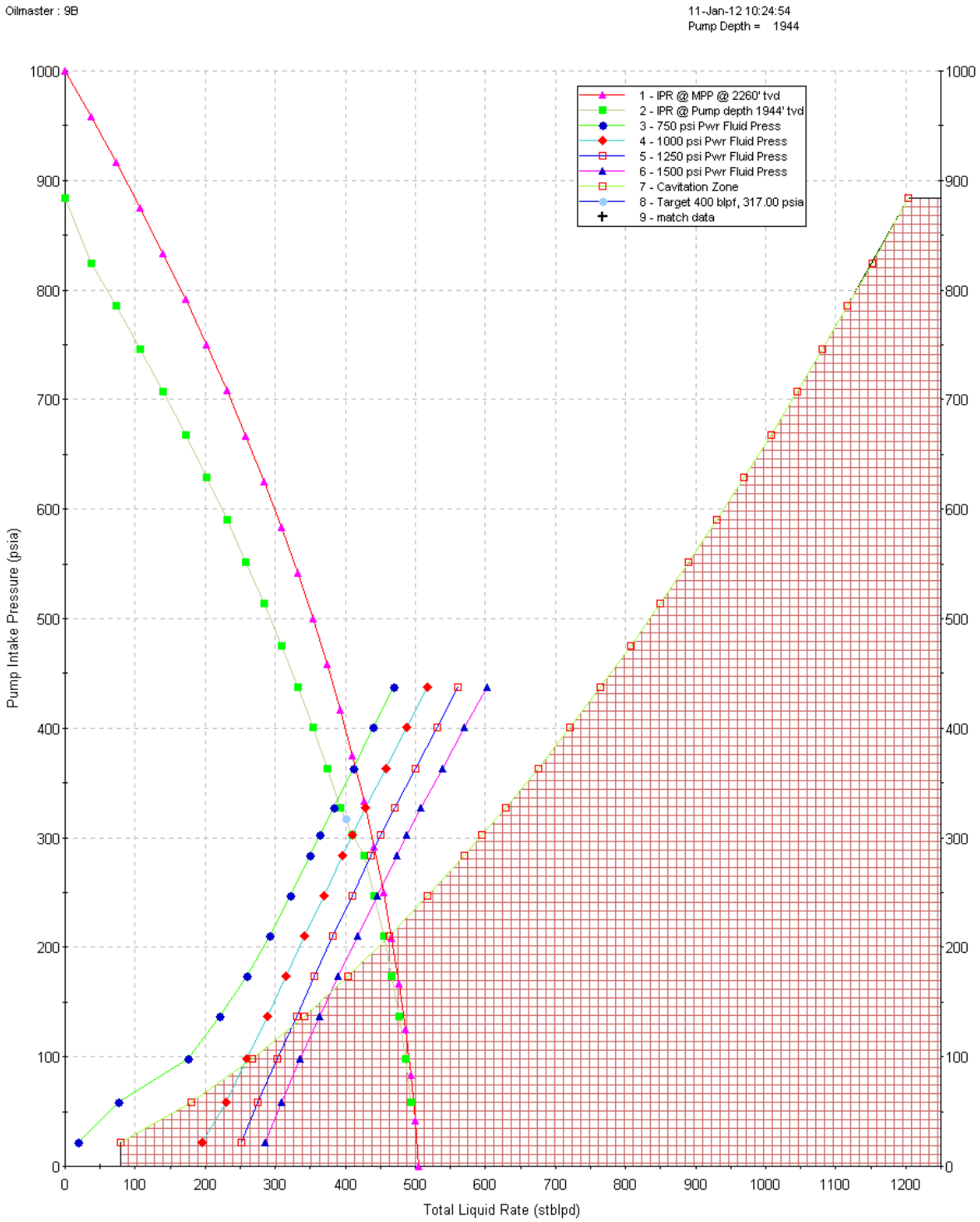

Figure 31: Oilmaster 9B Jet Pump Performance Prediction

Medium Water Rate Example: 150 BLPD with 11 mscf/d gas (Oilmaster “5C” Pump)

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Page  1
              SNAP Jet Pump Module Running With Snap 2.252.497 5/17/2011

 Developed By Ryder Scott Company with funding from ConocoPhillips Alaska, Inc. 2005
 Solution Algorithm based on SPE Petroleum Engineering Handbook, Hal Petrie, 1990
 Original pump performance relationship copyright Weatherford, Hai Phan 1982

--------------------------------------------------------------------------------
---
  Dataset: KLM Jet Pump 150 bpd Case 5C at 99 wc  07-11-11.snp
  Title: JP Case for Hydrate Well  07-11-11-11
--------------------------------------------------------------------------------
-----
 1) Perforation Depth       (ft) :   2260         13) Producing GOR  (scf/STB) :   7500
 2) Pump Vertical Depth     (ft) :   1944         14) Gas Sp. Gravity (air=1.) :  0.600
 3) Pump Installation                             15) Separator Press   (psig) :  100.0
            Reverse Flow installation             16) Well Static BHP   (psig) : 1000.0
 4) Casing ID (Power Fluid) (in) :  7.025         17) Pump Intake Press (psig) :  264.0
 5) Production Tbng ID (TopSeg in): 3.958         18) Well Test Flow Rate(bpd) :  151.0
 6) N/A                                           19) Well Head Temp   (deg F) :   60.0
 7) Production Tubing OD    (in) :  4.500         20) Bottom Hole Temp (deg F) :   41.0
 8) Tubing Length           (ft) :   1944         21) Not Vented               : Not
Vented
 9) Pipe Roughness e/d   (in/in) : 0.0018         22) Power Fluid oil/water    :  Water
10) Oil Gravity            (API) : 35.000         23) Power Fluid Spec Gravity :  1.068
11) Produced Vol Water Cut (%)   :  99.00         24) Bubble Point Press(psig) :    N/A
12) Water Specific Gravity       :  1.000         25) Well Head Press   (psig) :  100.0
================================================================================
  Oilmaster  5C  Pump Performance Summary
      Target Production Rate : 151 BLPD @pump intake pressure : 264 psig
      Predicted Surface Power Fluid Injection Pressure =   1338 psig
      Predicted Surface Power Fluid Injection Rate     =    446 bpf/d
      Predicted Pump Intake Pressure                   =    262 psig
      Predicted Pump Discharge Pressure                =    907 psig
      Predicted Power Fluid Pressure at Pump depth     =   2238 psig
      Predicted Horsepower requirement                 =     12 HP
================================================================================
```

Match Prod Rate (blpd)	Rate= 91	Rate= 121	Rate= 144	Rate= 163
Match Pwr Fluid Press (psig)	PFP = 750	PFP = 1000	PFP = 1250	PFP = 1500
Match Pwr Fluid Rate (blpd)	QN = 332	QN = 385	QN = 431	QN = 472
Match Pump Intake Pres(psig)	PIP = 556	PIP = 427	PIP = 304	PIP = 184
Pump Discharge Prs(psig)	PD = 915	PD = 912	PD = 908	PD = 905
Match Pwr Fld prs @pmp (psig)	PN = 1650	PN = 1900	PN = 2151	PN = 2401

PmpInPr PSIG	Qresvr STB/D	QCav STB/D	QSuctn STB/D	QNozzl B/D	cd	QSuctn STB/D	QNozzl B/D	cd	QSuctn STB/D	QNozzl B/D	cd	QSuctn STB/D	QNozzl B/D	cd
884	0	758	9999	278	1	9999	320	1	9999	357	1	9999	391	1
821	14	729	9999	289	1	9999	329	1	9999	366	1	9999	399	1
780	27	708	541	296	0	9999	336	1	9999	371	1	9999	404	1
739	40	687	506	303	0	606	342	0	687	377	0	755	409	0
697	53	666	466	310	0	575	348	0	658	382	0	730	414	0
656	64	644	388	316	0	527	354	0	629	388	0	704	419	0
615	76	621	322	323	0	488	360	0	590	393	0	671	424	0
573	87	598	185	329	0	445	365	0	557	398	0	642	429	0
532	97	573	12	335	0	366	371	0	521	404	0	610	434	0
491	107	548	0	342	2	309	377	4	467	409	0	569	438	0
450	116	522	0	0	2	187	382	0	423	414	0	535	443	0
409	124	495	0	0	2	77	387	0	348	419	0	499	448	0
368	133	466	0	0	2	0	393	2	269	423	0	447	452	0
328	140	436	0	0	2	0	0	2	193	428	0	404	457	0
287	147	404	0	0	2	0	0	2	109	433	0	333	461	0
247	154	371	0	0	2	0	0	2	24	438	0	263	466	0
207	160	335	0	0	2	0	0	2	0	442	2	203	470	0
168	165	296	0	0	2	0	0	2	0	0	2	136	474	0
129	170	253	0	0	2	0	0	2	0	0	2	69	478	0
93	175	207	0	0	2	0	0	2	0	0	2	7	482	0
60	179	157	0	0	2	0	0	2	0	0	2	0	485	2
38	182	118	0	0	2	0	0	2	0	0	2	0	0	2
36	185	112	0	0	2	0	0	2	0	0	2	0	0	2
19	188	74	0	0	2	0	0	2	0	0	2	0	0	2
0	189	0	0	0	2	0	0	2	0	0	2	0	0	2
Maximum HP Required			HP = 5			HP = 8			HP = 11			HP = 14		

Successful Codes (cd): 0 = normal JP operation, 1 = Well flowing, 2 = Pump stalling
Failure Codes : 3 = could not find operating point, 4 Function diverges from solution:min error given

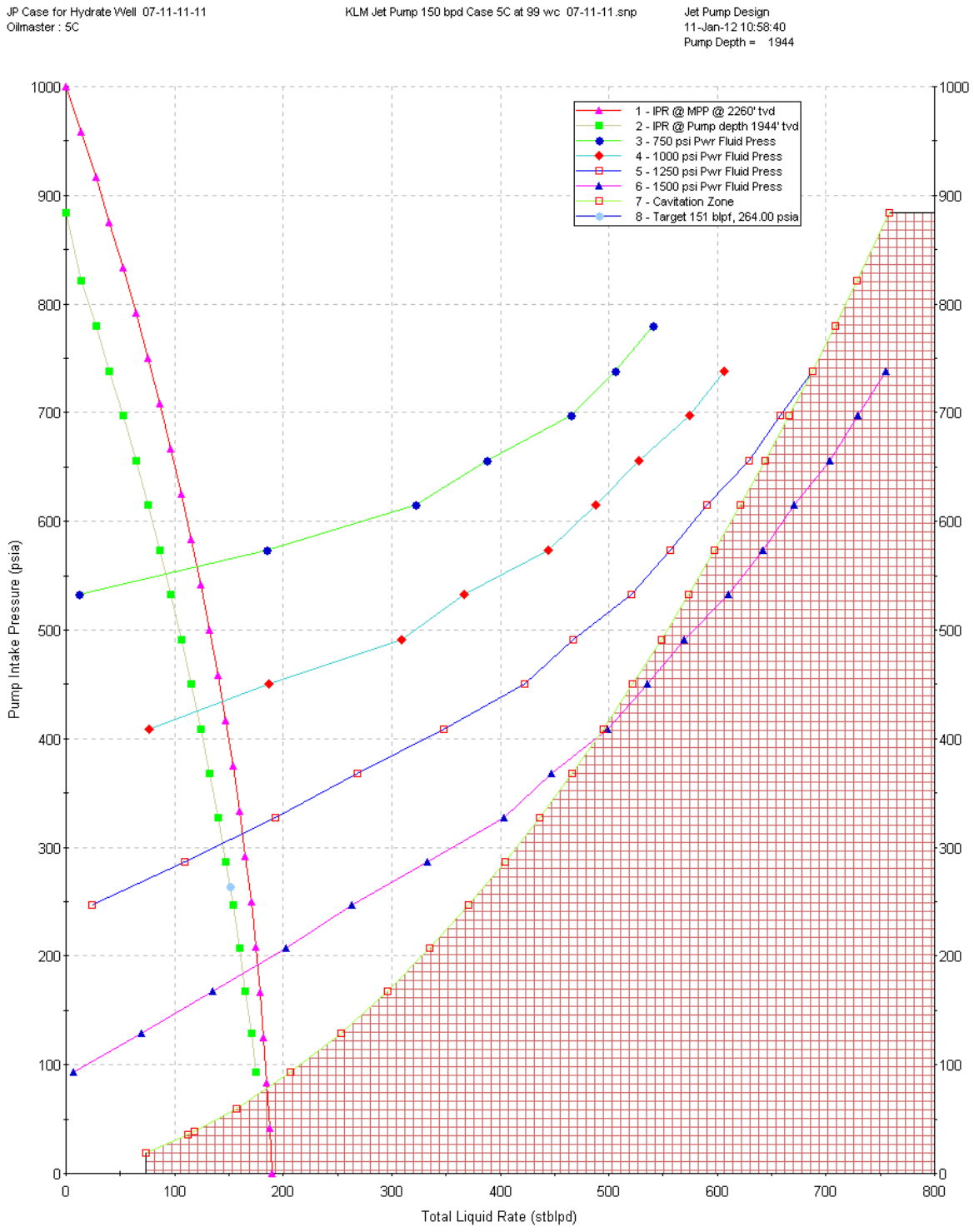

Figure 32: Oilmaster 5C Jet Pump Performance Prediction


DEPARTMENT OF ENERGY
UNITED STATES OF AMERICA