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SHEBERGHAN GAS GENERATION ACTIVITY (SGGA)

Contract No. EPP-I-00-03-00004-00, Task Order No. AID-306-TO-12-00002

SGDP Monthly Drilling Operations Progress Report

(Mod 6, Section F.5, Deliverable 13)

Period: September 1 – September 30, 2015
Submitted: October 6, 2015

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This SGDP Monthly Drilling Operations Progress Report is made possible by support from the American People sponsored by United States Agency for International Development (USAID). The contents of this SGDP Monthly Drilling Operations Progress Report were prepared by Advanced Engineering Associates International, Inc. and are the sole responsibility of Advanced Engineering Associates International, Inc. and do not necessarily reflect the views of USAID or the United States Government.

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Acronyms and Abbreviations

APA	Afghanistan Petroleum Authority
APPF	Afghanistan Public Protection Force
CCC	Credible Construction Company
CRA	Corrosive Resistant Alloy
DG	Director General
IL	Implementation Letter
m	Meters
MoF	Ministry of Finance
MoMP	Ministry of Mines and Petroleum
PM	Project Manager
SGDP	Sheberghan Gas Development Project
SGGA	Sheberghan Gas Generation Activity
TFBSO	Task Force for Business Stability and Operations in Afghanistan
TPAO	Turkish Petroleum Corporation
USAID	United States Agency for International Development

Monthly Drilling Operations Progress Report

Sheberghan Gas Development Project (SGDP)

A USAID – MoMP "On-Budget" Funded Program

The Sheberghan Gas Development Project (SGPD) is funded by the United States Agency for International Development (USAID) under Task Order No. AID-306-TO-12-00002, as modified. The project end ate is July 31, 2015. Under Phase I of SGDP, the Ministry of Mines and Petroleum (MoMP) on December 14, 2013, awarded a USD 36,757,766 "on-budget" contract to Turkish Petroleum Corporation (TPAO). The contract is funded jointly by USAID and MoMP as agreed under SOAG Implmentation Letter No. 45-01, and subsequent implementation letters. This contract currently requires TPAO to drill one new well, Juma #2A, and re-enter two wells, Bashikurd #3 and Bashikurd #9 in the Juma-Bashikurd Field in Jawzjan Provice. The Sheberghan Gas Generation Activity (SGGA) is responsible for monitoring SGDP progress as USAID's implementing partner. This report is required under USAID Task Order No. AID-306-TO-12-00002 Modification 3, Section F, Deliverable 24 Modification 5, Section F.5.B, Deliverable 13, and Modification 6, Section F.5, Deliverable 13.

1 SGDP Gas Field Operations

Activities Performed and Milestones Achieved During the Reporting Period

Summary

After reaching a total depth of 3481meters from the surface in the Juma No. 2A well, and reviewing the well test data, interpretations of the drilling records (mud logs) and open hole electric logs MoMP concluded that the low porosity of the target formation (the Jurassic Kugitan) and the consequent lack of available gas made the well non-commercial. No other potentially productive zones were identified and the well was plugged and permanently abandoned on September 28.

In view of the unexpectedly poor results from electric log interpretation from the Juma No. 2A well, and anticipating the impact on the scheduled contract operations, on October 8 SGGA initiated a geological review of other wells in the Bashikurd Field. Well cores from other wells, including the scheduled Bashikurd No. 9 well, were found in the Ministry's warehouse in Sheberghan. In cooperation with Ministry officials knowledgeable about the field, relevant samples were selected and analyzed by an independent laboratory. Based on the core analysis and drilling and testing records, SGGA recommended to the Ministry and to USAID that plans to re-enter the Bashikurd No. 9 well be cancelled due to poor commercial potential, but that plans to re-enter and deepen the Bashikurd No 3 well to test an additional horizon be continued.

Key Activities

- September 1: MoMP asked TPAO to provide information on grain size, cementation and lithology so that the Ministry could make a decision on the installation of production casing in the Juma No. 2A well.
- September 2: TPAO's informed MoMP that, based on its log interpretation and mud logging data, the Juma 2A showed little evidence of significant hydrocarbon potential, but that only flow testing of the well after casing would be determinative.
- September 3: SGGA engineers located the cores of Bashikurd wells nos.9, 10 and 15. SGGA and MoMP selected cores for laboratory test to determine whether porosity was similar Juma 2A.

- September 6: MoMP instructed TPAO to install production casing in the Juma 2A and conduct flow tests.
- September 7: TPAO provided the Juma 2A well completion program to MoMP and started installation of production casing.
- September 12: MoMP request TPAO's opinion on conducting PNN (pulse neutron-neutron) logging to further define formation porosity and hydrocarbon presence in the Juma 2A well. TPAO replied the next day that PNN was not appropriate for the well and, further, that it was not required to provide it by the drilling contract.
- September 14: SGGA recommended that MoMP and TPAO consider acid stimulation of the Juma 2A target formations. Acid stimulation a common industry procedure to enhance production in low porosity fractured limestone and dolomite formations such as those in the Juma 2A. Despite SGGA drilling engineers' recommendations and industry studies provided, MoMP appeared unfamiliar with and reluctant to try the procedure. TPAO posed many objections, most of which were either obvious or overstated, and were clearly unwilling to arrange the work. TPAO also requested additional payment. The treatment plan was dropped.
- September 18: MoMP approved TPAO's well completion program and perforation of two intervals in the Jurassic Kugitan formation.
- Also on September 18: TPAO submitted a proposed revised schedule extending the previously agreed contract performance period from September 25, 2015 to approximately January 15, 2016. MoMP granted an extension to October 11, 2015, after which contract delay penalties will be applied.
- September 21: SGGA delivered a memorandum to MoMP and USAID outlining contingency options based on Juma 2A well results and core analysis results from other wells. A copy of the memorandum is attached.
- September 18-25: Juma 2A Jurassic Kugitan formation perforated and flow tested at two intervals, with minimal gas flow; well pressure dropping to minimal levels after each test. A copy of the TPAO test report is attached.
- September 26: TPAO provided the Juma 2A flow test data and a well abandonment program to MoMP and asked for approval to abandon the well and move to Bashikurd #3.
- September 27: TPAO again requested an extension of time for the completion of the drilling contract.

- September 29: SGGA forwarded the well core porosity analysis, including data showing the porosity of the Bashikurd No. 9 to be even less than that in the Juma 2A. A copy of the report is attached.

Table 1: TPAO's Daily Drilling Report Summary

Date Sep 15	Target Depth	Mobilization Status	Drilling Staff	Security Staff	Actions and Formations
1	3481m	1/28 in route, 27/28 onsite or delivered	109	158	Waiting on approval to run 5 ½" anti-corrosion production casing
2	3481m	1/28 in route, 27/28 onsite or delivered	109	158	Waiting on approval to run 5 ½" anti-corrosion production casing
3	3481m	1/28 in route, 27/28 onsite or delivered	109	158	Waiting on approval to run 5 ½" anti-corrosion production casing
4	3481m	1/28 in route, 27/28 onsite or delivered	110	158	Waiting on approval to run 5 ½" anti-corrosion production casing
5	3481m	1/28 in route, 27/28 onsite or delivered	110	158	Waiting on approval to run 5 ½" anti-corrosion production casing
6	3481m	1/28 in route, 27/28 onsite or delivered	115	158	Run in hole for hole conditioning
7	3481m	1/28 in route, 27/28 onsite or delivered	115	158	Run 5 ½ production casing

Date Sep 15	Target Depth	Mobilization Status	Drilling Staff	Security Staff	Actions and Formations
8	3481m	1/28 in route, 27/28 onsite or delivered	115	158	Run 5 ½ production casing
9	3481m	1/28 in route, 27/28 onsite or delivered	112	158	Run 5 ½ production casing
10	3481m	1/28 in route, 27/28 onsite or delivered	117	158	Finished first stage of running 5 ½ production casing
11	3481m	1/28 in route, 27/28 onsite or delivered	105	158	cement plug generated in the well bore during cementing process
12	3481m	1/28 in route, 27/28 onsite or delivered	105	158	
13	3481m	28 unloaded in rig or camp site	107	158	Clean hole prior to pull out of hole (POOH)
14	3481m	28 unloaded in rig or camp site	107	158	Clean hole prior to pull out of hole (POOH)
15	3481m	28 unloaded in rig or camp site	107	158	Wireline logging
16	3481m	28 unloaded in rig or camp site	104	158	Pull out of the hole 2 7/8 working string by singles
17	3481m	28 unloaded in rig or camp site	104	158	Pull out of the hole 2 7/8 working string by singles
18	3481m	28 unloaded in rig or camp site	104	158	Swabbing. Perforate first shot b/w 3364 m and 3390.
19	3481m	28 unloaded in rig or camp site	104	158	Perforate first shot b/w 3364 m and 3390.
20	3481m	28 unloaded in rig or camp site	105	158	Perforate second interval b/w 3384 m and 3387
21	3481m	28 unloaded in rig or camp site	104	158	4 runs of perforation b/w 3384-3387,3381m-3384m,3378-3381m,3375m-3378m and performed well test
22	3481m	28 unloaded in rig or camp site	103	158	Well test, perforate b/w 3372-3375m.
23	3481m	28 unloaded in rig or camp site	100	158	Run in hole at the depth of 3436m
24	3481m	28 unloaded in rig or camp site	99	158	Swabbing operation
25	3481m	28 unloaded in rig or camp site	105	158	Well flow test.
26	3481m	28 unloaded in rig or camp site	94	158	Plug cement operation
27	3481m	28 unloaded in rig or camp site	102	150	Cont. plug cement operation
28	3481m	28 unloaded in rig or camp site	102	150	Complete plugging and abandonment of Juma #2A and prepare to move to Bashikurd #3
29	3481m	28 unloaded in rig or camp site	102	150	Wait on MoMP's approval to move to Bashikurd #3
30	3481m	28 unloaded in rig or camp site	102	150	Wait on MoMP's approval to move to Bashikurd #3

Table 2: Primary MoMP Staff Supporting SGDP

Job Title	Name	Contributions to SGDP
Minister of MoMP	Dr. Daud Shas Saba	IL 45-01 Signing Authority
Director General of APA	Dr. Qutbuddin Qaeym	Senior Oversight
SGDP Project Manager	Zabihullah Sarwari	Project Management, Communications
Sr. Assistant to SGDP Project Manager	Zabiullah Jaihoon	Administrative Assistance
Admin Assistant to SGDP Project Manager	Mustafa	Finance Assistance
Field Representative	Eng. Sadiq Halimi	Monitor Contractor Operations/Reports to PM
Field Representative	Eng. Ayuob Naiwand	Monitor Contractor Operations/Reports to PM
Field Representative	Eng. Amir Mohammad Selab	Monitor Drilling Operation/Reports to PM
Field Representative	Eng. Rozi Khan Sadid	Monitor Drilling Operation/Reports to PM

Most SGGA interfaces with Afghanistan Petroleum Authority (APA) are conducted with the SGDP Project Manager, Mr. Sarwari, who was appointed to his current position on October 2, 2013. Dr. Anwar Aryan was appointed to his position as interim head of the APA in early August 2014 and departed in early February 2015. The bulk of APA was de-funded on December 21, 2014, leaving approximately 72 staff members without contracts. Several staff members continued to come to the office and perform official duties despite their contract expirations. In early March, approximately 12 of the APA staff members received new contracts. N. Shinwari became the acting Director General (DG) of APA on or about March 4, 2015. However, for unknown reasons, he resigned after only four weeks in the position and Dr. Q. Qaeym took over leadership of APA near the end of March 2015.

Table 3: Primary SGGA Staff Supporting Drilling Operations

Job Title	Name	Contributions to SGDP
Chief of Party	Stroud Kelley	Manage All SGGA Activities
Senior Gas Sector Advisor	Randolph Bruton	Monitor Contract Compliance
On-Budget Task Manager	Naihmatullah Kohsar	Monitor TPAO Contract Operations
Sheberghan Site Manager	Peet Snyman	Coordinate Sheberghan Operations Logistics and Travel
Senior Engineer	Eng. Zalmai Zalmai	Technical Advisor and Liaison
Well Drilling and Testing	Eng. Beig Nazar	Technical Advisor
Drilling Engineer	Eng. Habibullah Mokhlis	Technical Advisor
Geologist	Eng. Wahid Qaeym	Technical Advisor

In addition to the SGGA staff listed in Table 3, SGGA has security, administrative, and translation personnel based in Sheberghan, and capacity development, translators, security, procurement, and administrative support staff based in Kabul.

2 SGDP Schedule and Financial Milestones

2.1 Key Contract Dates and Estimated Completion

Table 4: Key Contract Dates and Estimated Completion

Contract Award	Original Contract Time for Completion Period	Contract Mod 1 Time for Completion Period
December 14, 2013	September 10, 2014 Note: Extended Twice for 30 Days, Until November 9, 2014	September 25, 2015 Extended to August 31, 2015 Plus 25 Days of Contingency
TPAO's Latest Revised but Rejected Schedule		
On September 18, 2015, TPAO provided a new schedule extending the actual projected completion date to January 15, 2015. This schedule was immediately rejected by MoMP.		

Table 4 includes the contract time for completion schedule as well as TPAO's own schedule estimates, though rejected by MoMP. On 4 June 2014, TPAO submitted a second revised schedule which took its performance period out to approximately 487 days, to mid-April 2015. On August 1, 2014, TPAO submitted a third revised schedule which took their performance (time to complete contract) out to approximately 548 days, to mid-June 2015. It was later revised down to late May 2015. On December 5, 2014, TPAO submitted another revised schedule that extended their performance from May 21, 2015 to August 7, 2015. On January 14, 2015, TPAO submitted another revised schedule that extended their performance from August 7, 2015 to September 15, 2015. On February 9, 2015, TPAO sent an e-mail which suggested that they might be able to complete by August 31, 2015, however, they followed that up by announcing surprise discovery of salt horizons in the Juma-Bashikurd field (although the salt horizons were well known and the information readily available) that seemed to delay the date changes.

Following extension negotiations, on April 6, 2015, MoMP and TPAO reached agreement to extend the time for completion period to August 31, 2015, plus 25 days of contingency supposedly due to customs delays. This agreement was solidified in a document signed by the Acting Minister on April 26, 2015. However, before the contract time extension amendment was inked, on April 25, 2015, TPAO submitted another revised schedule (schedule #9 thus far), pushing completion of the work out another four months, to December 31, 2015. On September 18, 2015, TPAO provided a new revised schedule extending the actual projected completion date to January 15, 2015. Those TPAO schedules proposing to extend the period for completion of work beyond August 31, 2015, plus 25 contingency days were promptly rejected by MoMP.

The lack of urgency in submitting a performance security, completing the roads and campsites, submitting required insurance and subcontract approvals, and constantly revising completion schedules which are outside of agreed upon time lines provides a clear indication that this project is not a priority to TPAO.

2.2 TPAO Well Status – Technical

Table 5: TPAO Well Status (Per TPAO Schedule # 9, April 25, 2015)

Projected Juma 2A Time	Projected Bashikurd 3 Time	Projected Bashikurd 9 Time
105 Days + 30 Days Contingency	30 Days	21 Days
Present Working Depth (as of September 30, 2015)	Present Working Depth	Present Working Depth
3,481m total completed depth	-	-

2.3 TPAO Work Schedule – "☒" Marks Present Progress

Table 6: TPAO's Schedule (Per TPAO Schedule # 9, April 25, 2015)

TPAO Schedule, April 25, 2015	2014												2015											
	Quarter 1			Quarter 2			Quarter 3			Quarter 4			Quarter 1			Quarter2			Quarter 3			Quarter 4		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Well Drilling & Rehab Work																								
Preparation Rig & Equipment																								
Manufacture of 5 ½" CRA28 Casing																								
Shipment of 5 ½" CRA28 Casing										Delivered Onsite														
Road, Site, & Camp Construction												CCC Inspection Raised Rig Site Quality Concerns												
Mobilization to Juma 2A																								
TPAO Wait on Contractual Issues																								
Juma 2A – Drilling & Completion																					X			
Mobilization to Bashikurd 3																								
Bashikurd 3 – Drilling & Workover																								
Mobilization to Bashikurd 9																								
Bashikurd 9 – Re-Entry Well																								
Contractor Demobilization																								

Red – Completion Unverified Green – Work Verified Blue – Future Work Forecast

2.4 SGDP Drilling Contract Value and Funding Allocation

Table 7: SGDP Contract Amount and Funding Allocation

Drilling Contract Value	USAID Funding Share	MoMP Funding Share
$ 36,757,766.00	$ 30,000,000.00	$ 7,000,000.00
	Remaining MoMP Funding Share	$ 242,234

IL 45-01 is the source of the funding distribution between USAID and MoMP. USAID agreed to provide $30,000,000 in funding and MoMP agreed to an additional $7,000,000 in funding. This leaves only about $242,234 of the original project contingency funding available in the event contract modifications are required for any reason. On April 18, 2015, SGGA confirmed that SGDP remains a funding line item in Afghanistan's current 1394 budget, under entry: AFG/320143 for $7,500,000.

2.5 SGDP Invoicing Status

Table 8: SGDP Invoicing Status

Invoice #	Invoice Received	Invoice Amount	Invoice Status
Inv # M150623001	June 27, 2015	$1,400,000	Pending payment by MoF
TPAO - 2	TBD	$0	TBD
TPAO - 3	TBD	$0	TBD
TPAO - 4	TBD	$0	TBD
TPAO - 5	TBD	$0	TBD
TPAO - 6	TBD	$0	TBD

TPAO submitted their first invoice on June 27, 2015, though it was dated June 23, 2015. SGGA learned on July 27, 2015 that APA had not accomplished advance work necessary to prepare for processing the invoice promptly. A project code had not been established prior to this point by the Ministry; despite months of warning that the invoice was coming. As of September 30, 2015, the first TPAO invoice had not been paid, and remains unpaid as of the date of this report. Delays are attributable to Ministry of Finance insistence that the extension of the drilling contract should have been approved by the Afghan Special Procurement Commission, despite the fact that the Minister of Finance signed a SOAG Implementation Letter approving the extension. MoF's interpretation of the law is, in the opinion of SGGA, questionable. The past due invoice is currently accruing late payment penalties.

3 Implementation Letter Status

3.1 USAID – Ministry of Finance (MoF) – MoMP Implementation Letter Tracker

Table 9: USAID – MoF – MoMP Implementation Letter Tracker

IL Number	Date Issued	Subject
IL No. 45-01	May 29, 2012	Initial IL Beginning SGDP and Conditions Precedent
IL No. 45-02	January 17, 2013	IL Series Renumbered to Begin at 45-01
IL No. 45-03	January 2, 2013	SGDP Payment Process and Instructions
IL No. 45-04	January 17, 2013	MoMP's Submitted Conditions Precedent Accepted
IL No. 45-05	January 17, 2013	USAID Approval of MoMP Drilling Tender Issuance

IL Number	Date Issued	Subject
IL No. 45-06	March 7, 2013	USAID Approval of MoMP Drilling Tender Amendments
IL No. 45-07	November 2, 2013	USAID Approval of MoMP Human Resources Manual
IL No. 45-08	June 15, 2013	USAID Approval of MoMP Drilling Tender Re-Issue
IL No. 45-09	July 28, 2013	USAID Drilling Contract Award No Objection Letter
IL No. 45-10	October 5, 2013	USAID Approval of MoMP Petroleum Engineering Tender
IL Nos. 45-11/12	February/September 2014	Draft ILs regarding monitoring of compliance with and extension of the TPAO drilling contract, which were prepared but not processed due to TPAO's performance
IL No. 45-13	January 8, 2015	USAID Drilling Contract Extension No Objection Letter
IL No. 45-14	February 4, 2015	Direction SGDP Wells Not Cost Recoverable to Totimaidan Block
IL No. 45-15	July 15, 2015	Extension of SGDP Beyond 30 April 2015

Table 9 contains a list of all IL amendments issued thus far under SGDP. IL amendments have primarily functioned to approve conditions precedent and drilling tender/contract actions. As noted in the table, two draft ILs were prepared (45-11 and 45-12), but never processed. Additionally, a request by APA for a determination of non-availability of U.S. flag vessels was granted by USAID by letter dated September 25, 2014.

4 Drilling Operations Summary

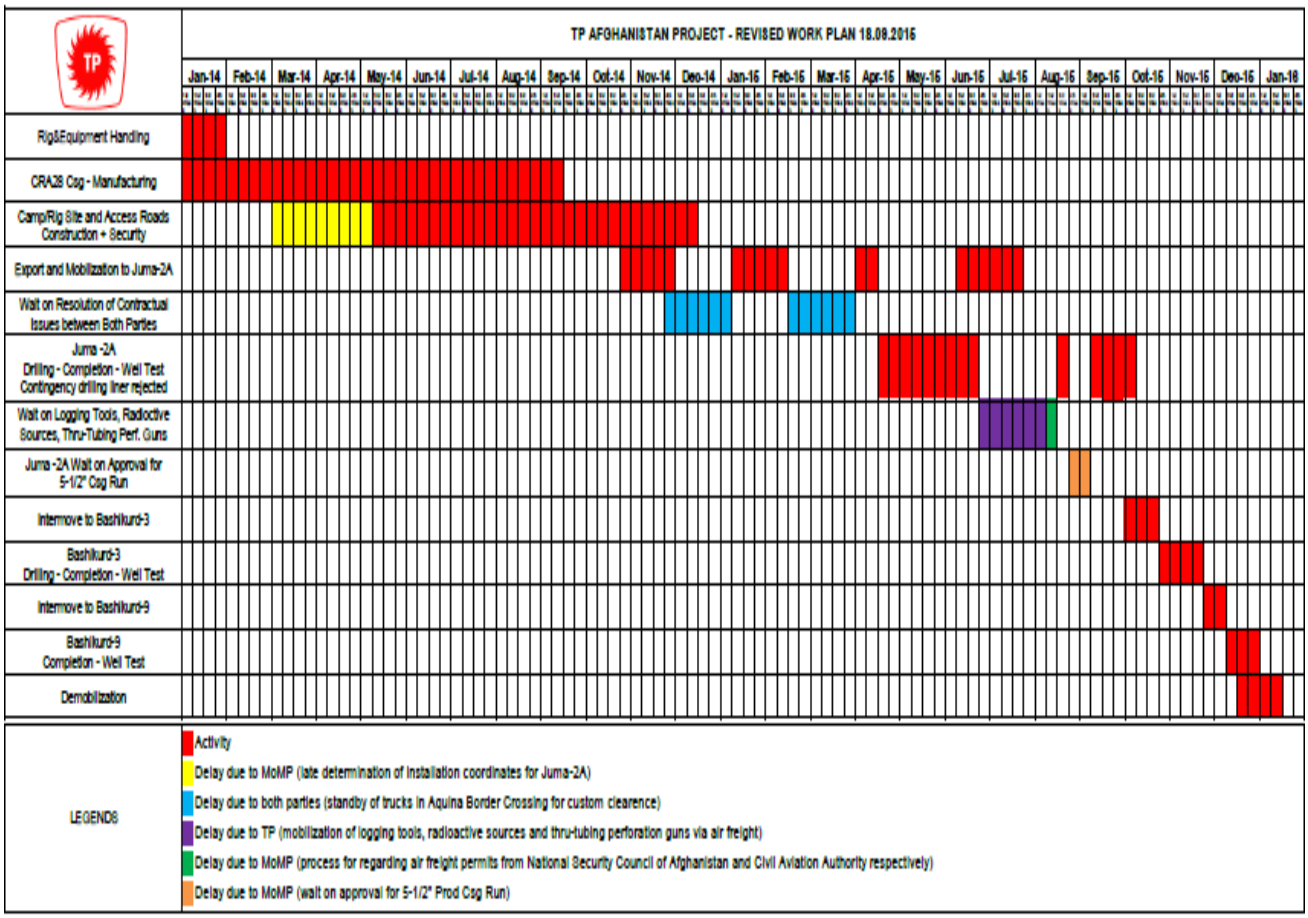
4.1 TPAO's Contract Performance Schedule

On September 18, 2015, TPAO submitted a proposed revised schedule extending the actual projected completion date to January 15, 2016. This schedule was rejected by MoMP. TPAO has plugged the Juma 2A well and waits for MoMP's approval to move to Bashikurd #3.

4.2 Progress This Period

See Section 1.1.1, above.

Figure 1 TPAO's proposed revised schedule. Rejected by MoMP.



Attachment 1: Physical property and Petrography Test Result of Core Samples from Bashikurd Well #9, #10 and #15.

Attachment 2: September 21 Memorandum on Contingency Options for Re-entry Program/ Post Juma Operation.

Attachment 3: Flow test results and Flow Test Graph, Juma #2A.

PHYSICAL PROPERTY AND PETROGRAPHY TEST RESULTS OF CORE SAMPLES FROM WELL#9, WELL # 10, WELL #15, BASHIKURD, SHEBERGHAN, JAWZJAN

Submitted To:

ADVANCED ENGINEERING ASSOCIATES INTERNATIONAL, INC.

Prepared By:

AFGHANITE GEO & MINING ENGINEERING SERVICES

Date: September 28, 2015

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Introduction

Afghanite Geo & Mining Engineering Services (ISO Certified) received 5 core boxes from 3 drilled wells (well 9, 10, 15) from "ADVANCED ENGINEERING ASSOCIATES INTERNATIONAL INCORPORATION" the contractor of the "Sheberghan Gas Development Project (SGDP)" a USAID support project to perform the needed tests to obtain the required parameters. The wells drilled in Bashikurd of Sheberghan in Jawzjan province around 30 years ago by USSR entities up to 3500 meters each well.

The samples boxes belong to these depth intervals:

Well No. 9 – From 3323 m to 3342 m

Well No. 10 – From 3313 m to 3336 m

Well No. 15 – From 3239 m to 3246 m& From 3328 m to 3335 m & From 3403 m to 3409 m

Scope of 7 ork

Afghanite had been requested to test 12 samples out of entire submitted core samples (4 Samples for each well) to obtain three major parameters; Density, Porosity, and Water absorption of the samples in accordance with ASTAM testing procedures.

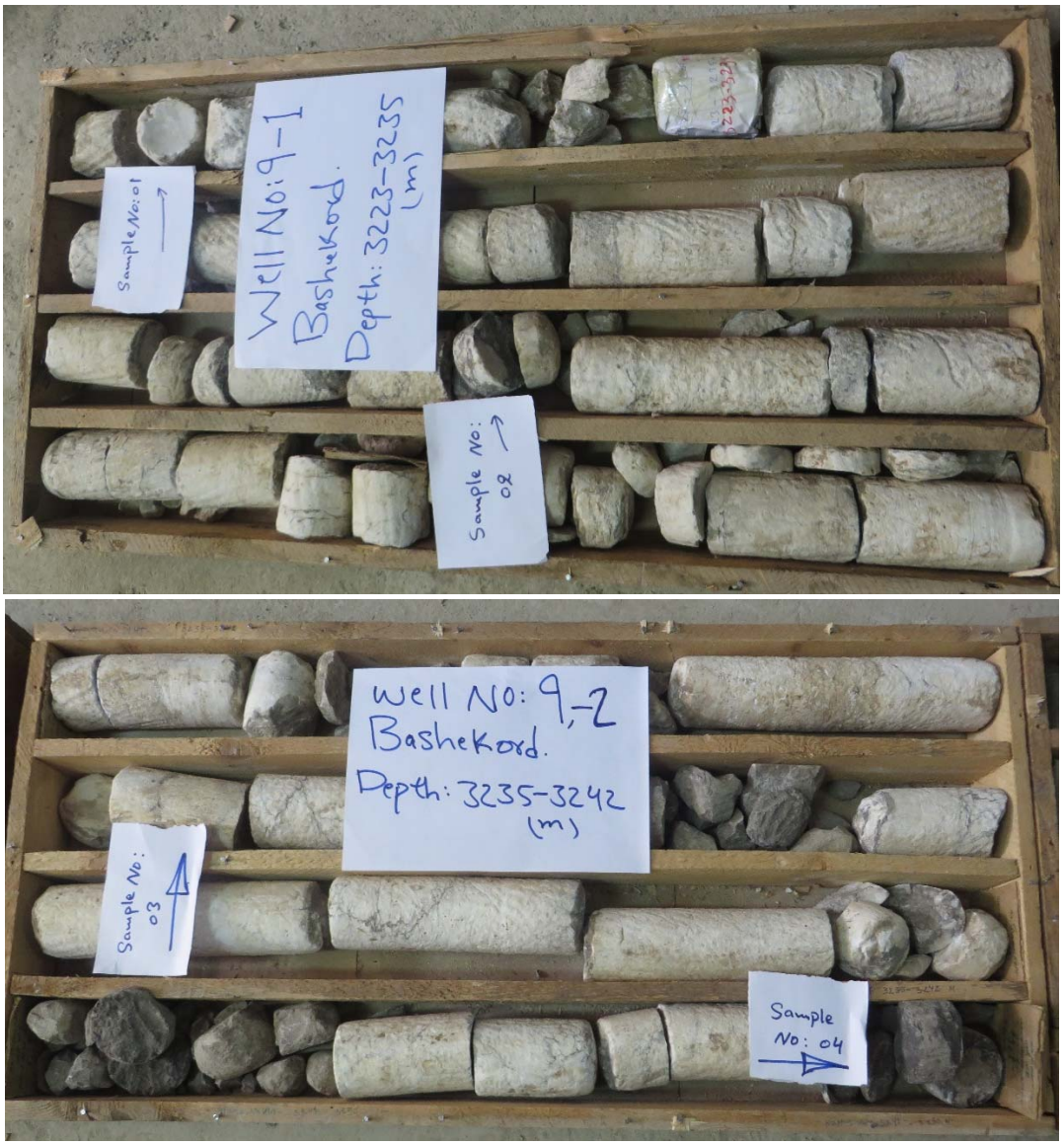
In addition to the requested test procedures Afghanite performed petrography analysis and XRF analysis for checking the Lithology and fabric of some samples to check the accordance of rock type of samples with the provided well log and compare the obtained porosity values with the observed microscopic fabric of the samples. These tests are added to the requested tests free of any extra charge and just as a quality control measure.

Sampling

Afghanite Co. received the core sample boxes from 3 different wells each box containing a specific length of cores from different depth intervals.

As per the work order for each well 4 samples should be selected for performance of the tests. The samples has been selected as per the representativeness of them for the whole length of the core interval and changes of the rock type within the core length.

The samples positions for each well are shown at the picture1 to picture3.



Picture 1. Samples 1 to 4 in Well No. 9 sampleboxes

Picture 2. Samples 1 to 4 in Well No. 10 sample box

Picture 3. Samples 1 to 4 in Well No. 15 sample boxes

Test Procedures

As per the received work order for obtaining Specific Gravity, Porosity and Absorption of the samples and according to ASTM standards (D6473, C127, and C97) Afghanite performed the needed test procedure on 12 samples selected from the core boxes of three wells.

The summary of the tests results are shown in the table1.

The comprehensive test results are provided in annex 1.

Table 1. Summary of the test results

AFGHANITE GEO & MINING ENGINEERING SERVICES
Summery of Test Results

Well No	Sample No	Water Absorption (%)	Particle Specific Gravity	Dry Density ($gr/cm^{3)}$	Saturated Density (gr/cm^3)	Porosity (%)	Effective Porosity (%)
9	1	0.21	3.003	2.9698	2.9699	2.20	0.62
9	2	0.41	2.892	2.8506	2.8507	2.88	1.17
9	3	0.16	2.977	2.963	2.963	0.98	0.48
9	4	0.19	2.865	2.8212	2.8213	3.09	0.54
10	1	1.55	2.897	2.7547	2.7551	5.63	4.21
10	2	0.12	3.007	2.9531	2.9531	3.62	0.35
10	3	0.15	2.98	2.9484	2.9484	2.14	0.43
10	4	0.23	2.996	2.9375	2.9376	4.00	0.67
15	1	0.42	2.815	2.8126	2.8127	0.16	1.19
15	2	0.13	2.859	2.8106	2.8106	3.44	0.37
15	3	0.49	2.826	2.7887	2.7888	2.68	1.37
15	4	0.18	2.992	2.9534	2.9535	2.62	0.54

Lithology and Fabric Study under Microscope

According to the wells logs Afghanite received from the contractor the rock types of the received core samples according to related depth intervals are marked as below:

Well No. 9 – From 3323 m to 3342 m (Anhydrite, Dolomite and Limestone)

Well No. 10 – From 3313 m to 3336 m (Dolomite and Limestone)

Well No. 15 – From 3239 m to 3246 m & From 3328 m to 3335 m & From 3403 m to 3409 m (Dolomite and Limestone)

For checking the accordance of the lithology of the samples with the provided logs Afghanite prepared 2 thin sections for studying under microscope. One sample selected from the light colored dominant rock type in well No. 9 and the other was selected from the dark colored dominant rock type in well No. 15.

Along with study of the mineral composition of the rock samples all the texture and fabric features specially the porosity quantity and distribution pattern of the samples got studied. The aim of this study is to check the test results in previous section.

The petrography report is provided in Annex 2.

As another checking measure of the lithology Afghanite has performed 2 XRF Analysis with Niton FXL950 analyzer that the analysis results are provided in Annex 3.

As it could be seen at the relevant reports the rock type of the samples determined as (Anhydrite for well No. 9 and Dolomitic Limestone for well No. 15) that is in accordance with the wells log. The sample chemical composition is confirming the petrography study report as well.

Fabric study of the samples showing an interlocking crystallization in Anhydrite and a micritic dense limestone with dolomite crystals is conforming the porosity values obtained from testing the samples according to ASTM standards.

ANNEX 1
TEST RESULTS

AFGHANITE GEO & MINING ENGINEERING SERVICES
MATERIAL TESTING LAB

AFGHANITE
GEO & MINING ENGINEERING SERVICES

MAXIMAUM SPCIFIC GRAVITY AND VOID OF CONCRETE

Client	USAID/MOMP	**Sampling Date**	22.09.2015
Contractor	AEAI	**Testing Date**	28.09.2015
Project	Sheberghan Gas Development Project		
Location	Bashikurd	**Well No**	09

SAMPLE NO		1	2	3	4
Picnometer + Sample	**(gr)**	4121	3565	5697	3854
Picnometer	**(gr)**	2935	2845	4640	3112
Sample	**(gr)**	1186	720	1057	742
Picnometer + Water	**(gr)**	10321	9380	12060	9988
Picnometer + Water + Sample	**(gr)**	11112	9851	12762	10471
Volume of Sample		395	249	355	259
Particle Specific Gravity		3.003	2.892	2.977	2.865
Saturated Density of Sample	**(gr/cm^3)**	2.9699	2.8507	2.9630	2.8213
Dry Density of Sample	**(gr/cm^3)**	2.9698	2.8506	2.9630	2.8212
Void Ratio of Sample		0.0110	0.0144	0.0049	0.0155
Porosity of Sample	**(%)**	2.20	2.88	0.98	3.09

Remarks

Tested By:	**Akbar Ali**
Checked By:	**Jafari**

AFGHANITE
GEO & MINING ENGINEERING SERVICES

AFGHANITE GEO & MINING ENGINEERING SERVICES

MATERIAL TESTING LAB

Absorption and Effective Porosity of Dimension Stone

Client	USAID/MOMP	**Location**	Bashikurd
Contractor	AEAI	**Sampling Date**	22/09/2015
Project Name	Sheberghan Gas Development Project	**Testing Date**	28/09/2015
Well No	9		

	Description		Sample No.					
			1	2	3	4	5	6
1	**Temperature of water**	(C)	24	24	24	24		
2	**Wt. of dried specimen (W1)**	(g)	856.80	389.80	1716.90	524.60		
3	**Wt. of specimen after immersion (W2)**	(g)	858.60	391.40	1719.70	525.60		
4	**Wt. of soaked specimen in water (W3)**	(g)	569.50	254.10	1139.30	339.30		
6	**Absorption**	(%)	**0.21**	**0.41**	**0.16**	**0.19**		
	Moisture Content	(%)	**0.0021**	**0.0041**	**0.0016**	**0.0019**		
	Saturated Density	(gr/cm^3)	**2.9699**	**2.8507**	**2.9630**	**2.8213**		
	Effective Porosity	(%)	**0.62**	**1.17**	**0.48**	**0.54**		

Remark :

Tested By	**Akbar Ali**
Checked By	**Jafari**

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MATERIAL TESTING LAB

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MAXIMAUM SPCIFIC GRAVITY AND VOID OF CONCRETE

Client	USAID/MOMP	**Sampling Date**	22.09.2015
Contractor	AEAI	**Testing Date**	28.09.2015
Project	Sheberghan Gas Development Project		
Location	Bashikurd	**Well No**	10

SAMPLE NO		1	2	3	4
Picnometer + Sample	**(gr)**	4211	5845	5545	4920
Picnometer	**(gr)**	2945	4465	4505	4111
Sample	**(gr)**	1266	1380	1040	809
Picnometer + Water	**(gr)**	10255	12321	12120	12244
Picnometer + Water + Sample	**(gr)**	11074	13242	12811	12783
Volume of Sample		447	459	349	270
Particle Specific Gravity		2.832	3.007	2.980	2.996
Saturated Density of Sample	**(gr/cm^3)**	2.7551	2.9531	2.9484	2.9376
Dry Density of Sample	**(gr/cm^3)**	2.7547	2.9531	2.9484	2.9375
Void Ratio of Sample		0.0281	0.0181	0.0107	0.0200
Porosity of Sample	**(%)**	5.63	3.62	2.14	4.00

Remarks

Tested By:	**Akbar Ali**
Checked By:	**Jafari**

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MATERIAL TESTING LAB

Absorption and Effective Porosity of Dimension Stone

Client	USAID/MOMP	Location	Bashikurd
Contractor	AEAI	Sampling Date	22/09/2015
Project Name	Sheberghan Gas Development Project	Testing Date	28/09/2015
Well No	10		

	Description		Sample No.					
			1	2	3	4	5	6
1	Temperature of water	(C)	24	24	24	24		
2	Wt. of dried specimen (W1)	(g)	515.20	1101.10	1704.30	1000.30		
3	Wt. of specimen after immersion (W2)	(g)	523.20	1102.40	1706.80	1002.60		
4	Wt. of soaked specimen in water (W3)	(g)	333.30	729.10	1127.90	661.30		
6	Absorption	(%)	**1.55**	**0.12**	**0.15**	**0.23**		
	Moisture Content	(%)	**0.0155**	**0.0012**	**0.0015**	**0.0023**		
	Saturated Density	(gr/cm^3)	**2.7551**	**2.9531**	**2.9484**	**2.9376**		
	Effective Porosity	(%)	**4.21**	**0.35**	**0.43**	**0.67**		

Remark :

Tested By	Akbar Ali
Checked By	Jafari

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MAXIMAUM SPCIFIC GRAVITY AND VOID OF CONCRETE

Client	USAID/MOMP	**Sampling Date**	22.09.2015
Contractor	AEAI	**Testing Date**	28.09.2015
Project	Sheberghan Gas Development Project		
Location	Bashikurd	**Well No**	15

SAMPLE NO		1	2	3	4
Picnometer + Sample	**(gr)**	4255	4310	5212	4882
Picnometer	**(gr)**	2963	3115	4302	4125
Sample	**(gr)**	1292	1195	910	757
Picnometer + Water	**(gr)**	9872	12102	11102	11421
Picnometer + Water + Sample	**(gr)**	10705	12879	11690	11925
Volume of Sample		459	418	322	253
Particle Specific Gravity		2.815	2.859	2.826	2.992
Saturated Density of Sample	**(gr/cm^3)**	2.8127	2.8106	2.7888	2.9535
Dry Density of Sample	**(gr/cm^3)**	2.8126	2.8106	2.7887	2.9534
Void Ratio of Sample		0.0008	0.0172	0.0134	0.0131
Porosity of Sample	**(%)**	0.16	3.44	2.68	2.62

Remarks

Tested By:	**Akbar Ali**
Checked By:	**Jafari**

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MATERIAL TESTING LAB

Absorption and Effective Porosity of Dimension Stone

Client	USAID/MOMP	**Location**	Bashikurd
Contractor	AEAI	**Sampling Date**	22/09/2015
Project Name	Sheberghan Gas Development Project	**Testing Date**	28/09/2015
Well No	15		

	Description		Sample No.					
			1	2	3	4	5	6
1	**Temperature of water**	(C)	24	24	24	24		
2	**Wt. of dried specimen (W1)**	(g)	448.70	382.30	425.70	1578.40		
3	**Wt. of specimen after immersion (W2)**	(g)	450.60	382.80	427.80	1581.30		
4	**Wt. of soaked specimen in water (W3)**	(g)	290.40	246.60	274.40	1045.90		
6	**Absorption**	(%)	**0.42**	**0.13**	**0.49**	**0.18**		
	Moisture Content	(%)	**0.0042**	**0.0013**	**0.0049**	**0.0018**		
	Saturated Density	(gr/cm^3)	**2.8127**	**2.8106**	**2.7888**	**2.9535**		
	Effective Porosity	(%)	**1.19**	**0.37**	**1.37**	**0.54**		

Remark :

Tested By	**Akbar Ali**
Checked By	**Jafari**

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ANNEX 2
PETROGRAPHY REPORT

Introduction

This report presents the results of laboratory work performed by Afghanite (Geo & Mining Engineering Services) on thin sections from cores.

The scope of our work was limited to performing petrographic analysis on the rock core samples to provide a geological description of the samples and samples along with its mineralogy and composition. The conclusion of the petrographic analysis on the samples will give us the idea about the strength and properties of minerals composing the sample.

Methods for the preparation of samples for Petrographic examination:

- ## Thin sections

  - **Introduction**

    Thin sections are made from small slabs of a rock sample glued to a glass slide (~1 inch by 3 inches), and then ground to a specified thickness of 0.027mm (27 microns). At this thickness most minerals become more or less transparent and can then be studied by a microscope using transmitted light. The following are the process of preparation of thin sections.

  - **Cutting**

    Samples should take to the initial cutting using a water-lubricated large diameter diamond saw. Before this operation we mark the proper portion of the sample to avoid improper sampling for making the thin sections.

  - **Initial lapping**

    Prior to mounting the specimen on to a glass slide, it is necessary to remove the damage introduced into the surface of the sample during cutting. This is generally done using a combination of grinding and lapping to produce a high quality optically flat surface that can be bonded on to a glass microscope slide.

  - **Mounting onto glass slides**

    The flattened specimen should be fully cleaned – preferably using an ultrasonic cleaning bath and a solvent such as petroleum spirit. The polished surface should then be wiped over with a soft tissue using a solvent such as methylated spirits or acetone. The cleaned surface is then bonded on to a frosted glass slide using a UV-curing adhesive. It is important in mounting the specimen on to the glass that the

thickness of the bond is of a controlled thickness and is kept to a minimum under the specimen.

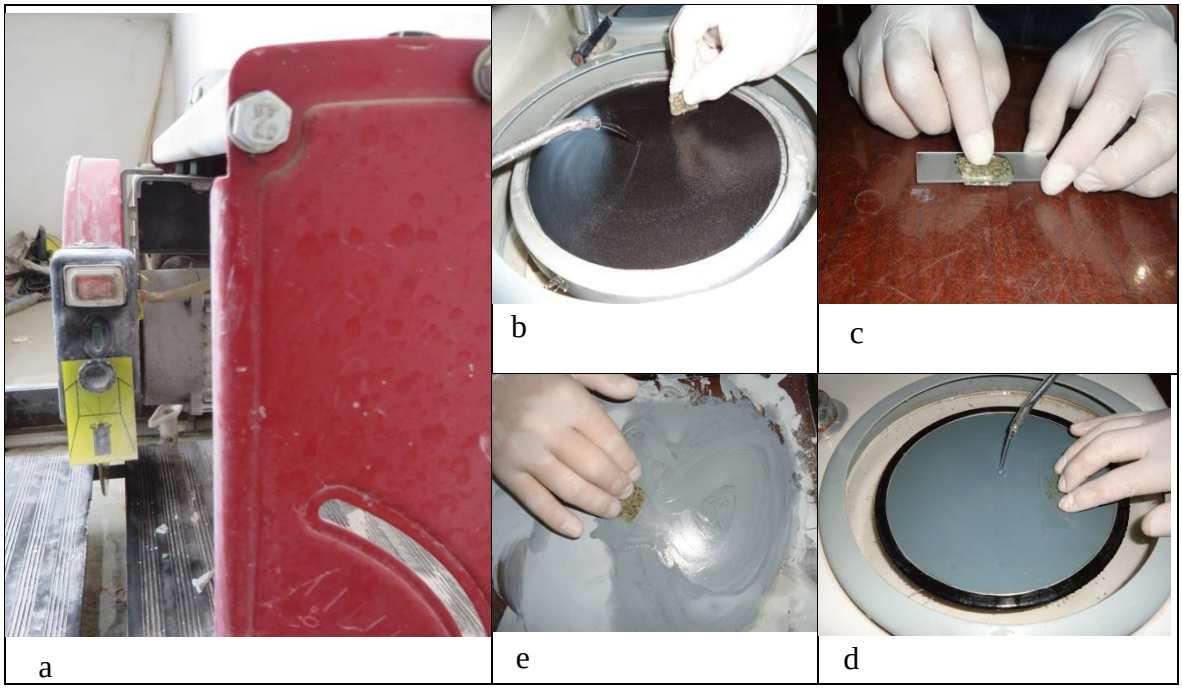


Figure 1a) Cutting, b) initial lapping, c) mounting to glass slide, d) removal of excess mineral, e) final lapping

- **Removal of excess material**

  Once bonded on to glass the specimen is then ready for the excess concrete to be cut off. This is done using precision oil-water lubricated diamond saw and when complete should leave a section thickness of the order of 1mm.

- **Final lapping**

  The thin sample is then ground down in stages to a thickness of approximately 150 to 200µm using diamond surface-grinding equipment lubricated by oil-water. Further lapping using a precision vacuum chuck is used to take the section to a thickness of about 40µm. If it is to be hand finished.

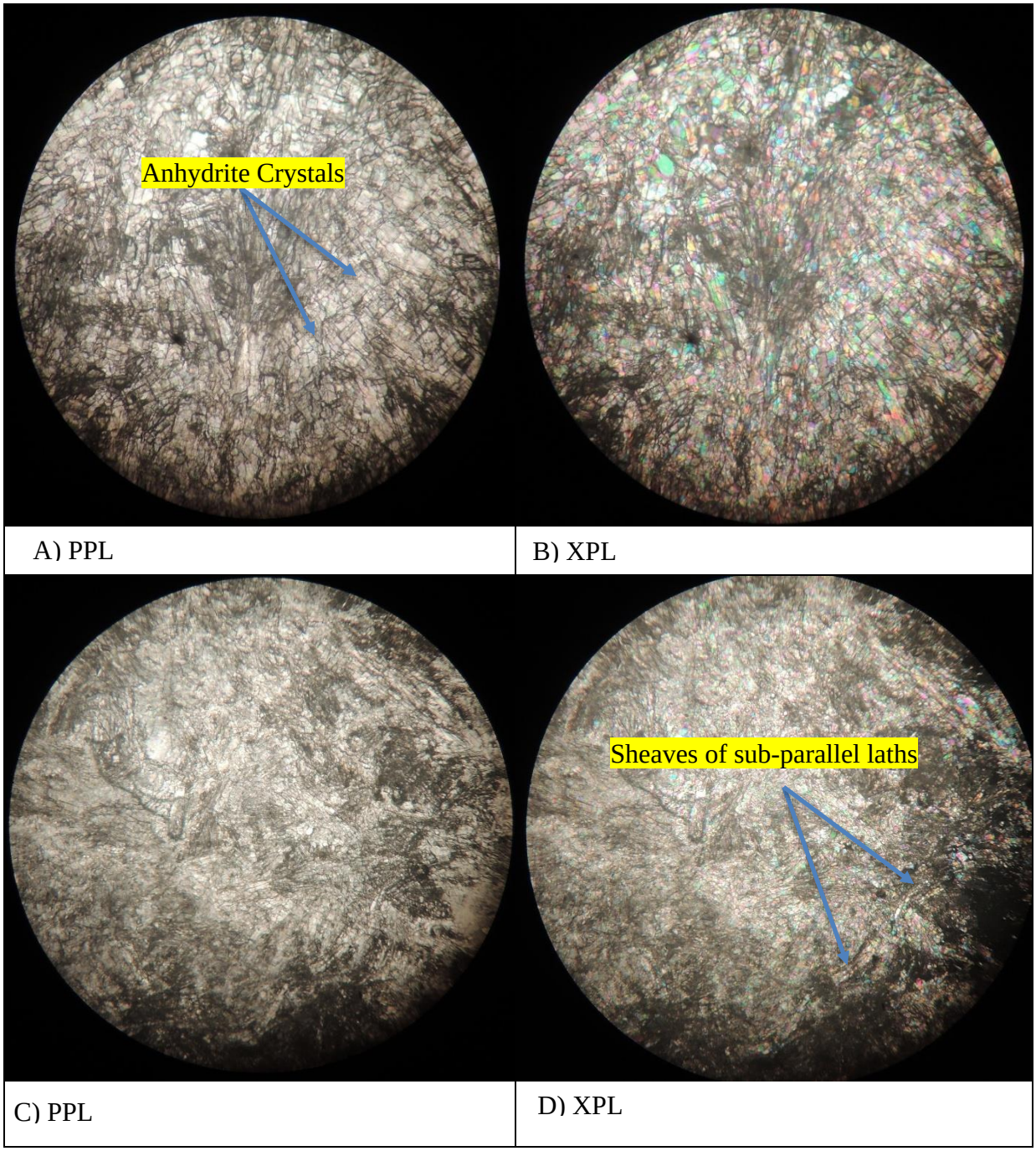
- **Hand finishing**
  Using a petrological microscope to measure the thickness of the thin section the section can be hand finished down to its final thickness of 25-30µm. The birefringence of quartz particles present in the sample often provide a convenient way of judging the thickness of the thin section during hand finishing.

Test results

Our completed petrographic analysis result has been attached in the following pages. A summary of our analysis and our opinions are as follows:
Since there were twelve samples, we made two thin sections from different places. In the following lines we attend to describe the thin sections, where we studied under the polarizer microscope in the Afghanite Petrographic Laboratory.

Sample No: 03 from Well No: 9-2

This sample is a rock composed of anhydrite. The anhydrite occurs as separate rectangular crystals and as sheaves of sub-parallel laths. Most of the anhydrite crystals show two cleavages at 90 degree, and bright second- and third-order interference colors. There are a little of micrite in this Sample.



A) PPL	B) XPL
C) PPL	D) XPL

Figure 2:(A) Shows anhydrite minerals, PPL, magnification X100 (B) shows the same sample A, XPL, magnification X100, (C) shows as sheaves of sub-parallel laths, of anhydrite crystals. PPL, magnification X40, (D) shows the same sample C, XPL, magnification X40.

	Sample No; Sample No: 03 from Well No: 9-2.
Color	White
Structure	massive
Degree of weathering	fresh
Coating	None
Porosity (%)	0.97
GS (Specific Gravity)	≈ 2.97
Acid test (cold dilute hydrochloric acid)	None react

Mineral Composition				Qualitative Description	
Major component	Vol ٪	Minor component	Vol ٪		
Anhydrite	95>%	Micrite	5<%	Texture	Fibrous
				Voids (%)	0.97
				Matrix-cement	Micrite

Geological Description	
Rock name	Anhydrite
Petrographic classification	Evaporation Rock
Geologic formation	Sedimentary

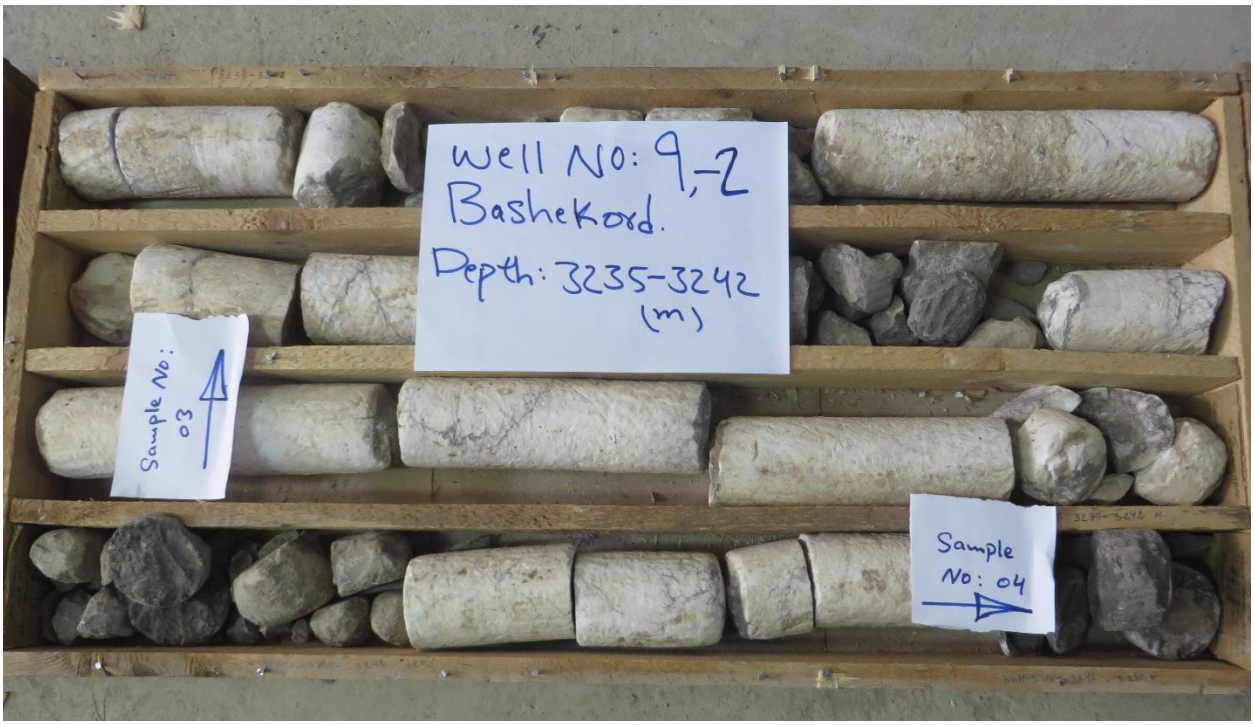


Figure 3: A picture of hand specimen sample No: 03 from Well No 9-2

Sample No 12 from Well No 15-2

This sample is a dolomitic limestone containing about 30 % dolomite. The dolomites are unstained and occurs as euhedral rhomb-shaped crystals which contain inclusions probably of calcite and arc thus cloudy. In some places there are some veins that has been filled by accumulation of dolomite. Matrix of this sample is cement of micrite.

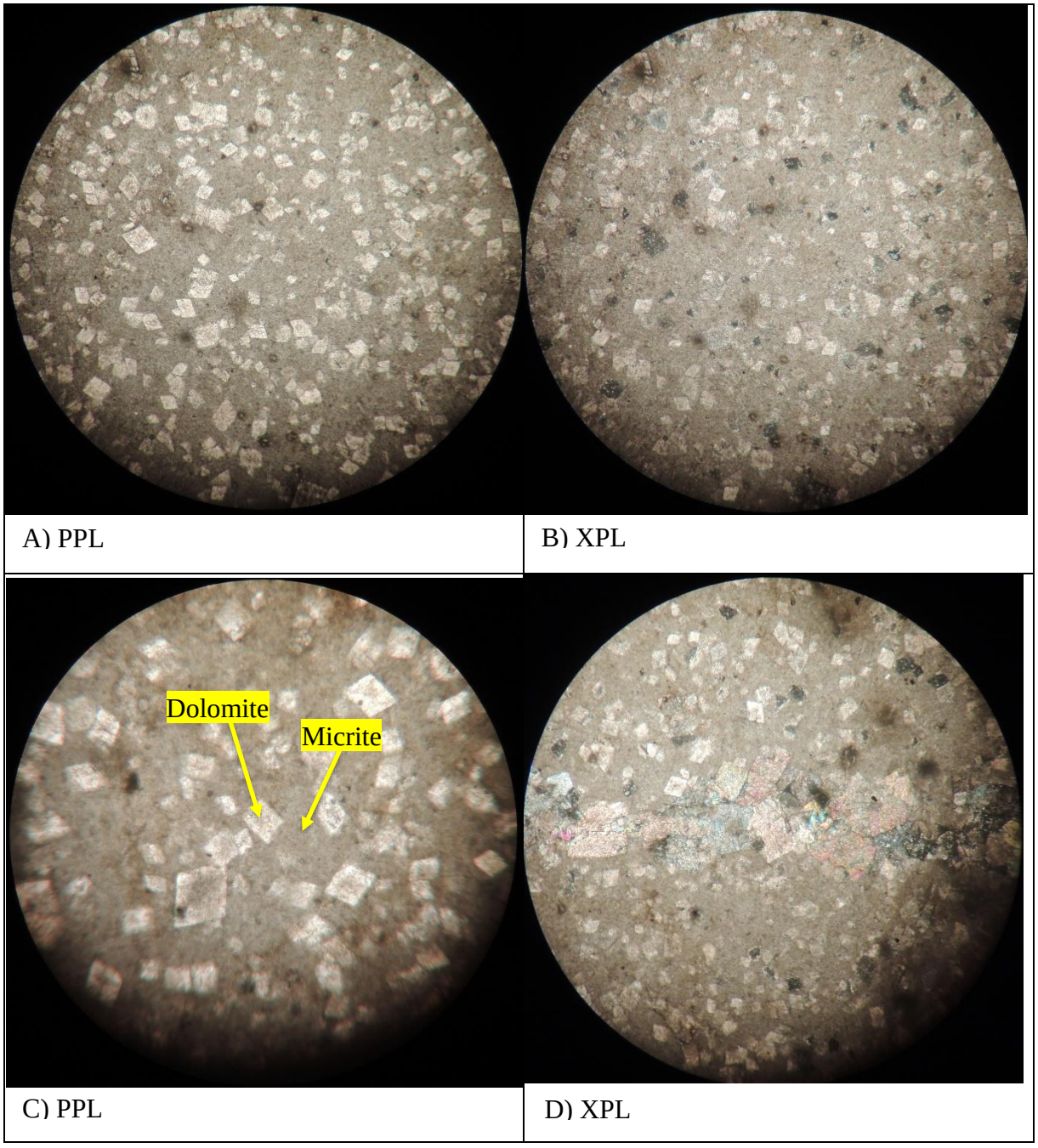


Figure 4. (A) Shows Dolomite minerals, PPL, magnification X40 (B) shows the same sample A, XPL, magnification X40, (C) shows Dolomite and texture of Micrite. PPL, magnification X100, (D) shows accumulation of Dolomites in vein, XPL, magnification X40.

	Sample No; Sample No: 12 from Well No: 15-2
Macroscopic description of sample	
Color	Grey to Black
Structure	massive
Degree of weathering	fresh
Coating	None
Porosity (%)	2.61
GS (Specific Gravity)	≈ 2.99
Acid test (cold dilute hydrochloric acid)	react

Mineral Composition				Qualitative Description	
Major component	Vol ٪	Minor component	Vol ٪		
Micrite	70 %	Dolomite	30 %	Texture	Matrix supported
				Voids (%)	2.61
				Matrix-cement	Micrite

Geological Description	
Rock name	Dolomitic Limestone
Petrographic classification	Carbonate Rock
Geologic formation	Sedimentary

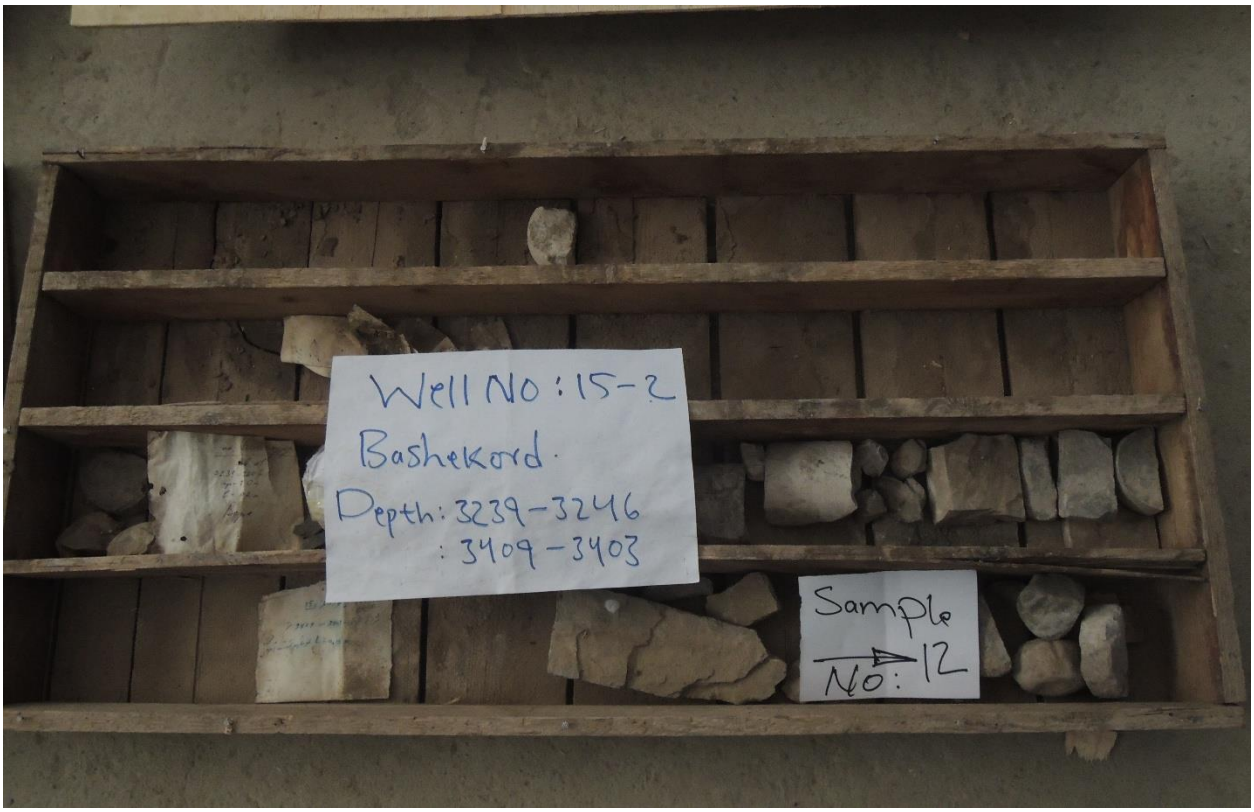


Figure 5: A picture of hand specimen sample No: 12 from Well No 15-2

ANNEX 3

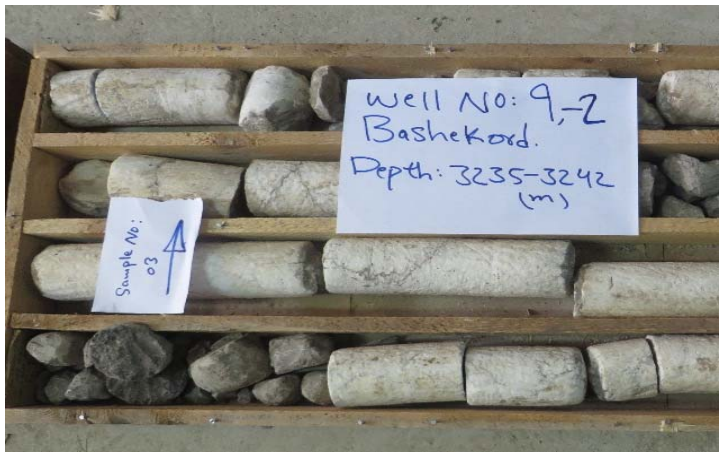
XRF ANALYSIS REPORT

XRF ANALYZING SERVICES

Thermo Scientific Niton FXL Model & Thermo Scientific Niton XL3t Ultra

Client	USAID/MOMP	**Location**	Bashikurd	**Contractor**	AEAI		
Project Name	Sheberghan Gas Development Project	**Type**	Rock	**Sample NO**	Sample No: 03 from Well No: 9-2	**Sampling Date**	22 Sep 2015
Duration	126.5	**Flags**	8mm	**Test Mode**	TestAll Geo	**Testing Date**	27 Sep 2015

	ppm	+/-	Error
Mo	0	:	N/A
Zr	11.346	+/-	6.450
Sr	964.478	+/-	14.501
U	0	:	N/A
Rb	0	:	N/A
Th	0	:	N/A
Pb	0	:	N/A
Au	0	:	N/A
Se	0	:	N/A
As	0	:	N/A
Hg	0	:	N/A
Zn	0	:	N/A
W	0	:	N/A
Cu	31.664	+/-	18.607
Ni	99.995	+/-	25.498
Co	0	:	N/A
Fe	469.872	+/-	56.020
Mn	115.283	+/-	58.205
Cr	0	:	N/A
V	0	:	N/A
Ti	0	:	N/A
Sc	272.638	+/-	81.979
Ca	273776.281	+/-	2298.939
K	315.936	+/-	102.702
S	401846.719	+/-	2112.969
Ba	620.656	+/-	46.956
Cs	0	:	N/A
Te	122.276	+/-	20.777
Sb	36.047	+/-	9.698
Sn	31.617	+/-	8.424
Cd	15.474	+/-	8.539
Ag	18.098	+/-	6.708
Pd	16.261	+/-	6.809
Nd	1072.279	+/-	111.267
Pr	573.595	+/-	73.946
Ce	281.201	+/-	61.302
La	299.859	+/-	56.376
Bal	315234.781	+/-	3807.724
Nb	0	:	N/A
Y	0	:	N/A
Ta	0	:	N/A
Al	0	:	N/A
P	0	:	N/A
Si	5151.708	+/-	490.564
Mg	0	:	N/A



According to XRF test result:
Sample No 03, Well No: 9-2 is Anhydrite (CaSo4).

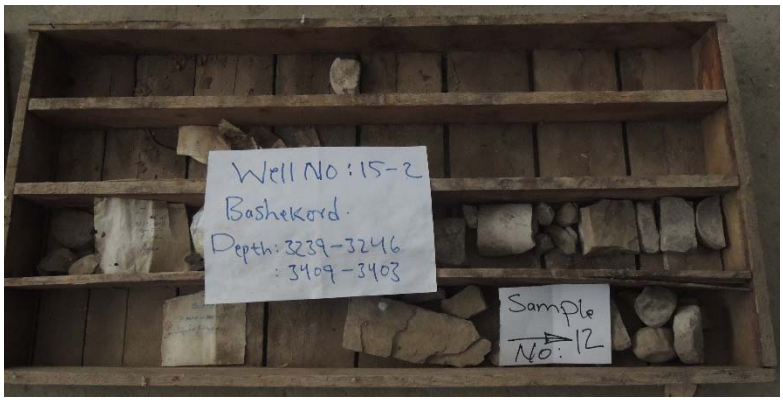
Address: House #100, Qasimi Alley, Next to Q Kabul, 40 Meter Rd, Kabul, Afghanistan
AISA: D-56729
TIN: 900 117 2 742
E-Mail:info@afghanite.net

XRF ANALYZING SERVICES

Thermo Scientific Niton FXL Model & Thermo Scientific Niton XL3t Ultra

Client	USAID/MOMP	**Location**	Bshikurd	**Contractor**	AEAI		
Project Name	Sheberghan Gas Development Project	**Type**	Rock	**Sample NO**	Sample No: 12 from Well No:15-2	**Sampling Date**	22 Sep 2015
Duration	126.5	**Flags**	8mm	**Test Mode**	TestAll Geo	**Testing Date**	27 Sep 2015

	ppm	+/-	Error
Mo	0	:	N/A
Zr	3.625	+/-	1.917
Sr	101.478	+/-	2.951
U	0	:	N/A
Rb	3.591	+/-	1.946
Th	4.491	+/-	2.366
Pb	6.338	+/-	3.209
Au	10.639	+/-	4.135
Se	0	:	N/A
As	0	:	N/A
Hg	0	:	N/A
Zn	0	:	N/A
W	0	:	N/A
Cu	25.396	+/-	10.395
Ni	69.236	+/-	14.239
Co	0	:	N/A
Fe	961.079	+/-	42.911
Mn	137.453	+/-	34.889
Cr	0	:	N/A
V	0	:	N/A
Ti	101.381	+/-	54.074
Sc	0	:	N/A
Ca	323131.531	+/-	1588.954
K	2796.912	+/-	196.750
S	2647.179	+/-	137.435
Ba	451.566	+/-	39.901
Cs	0	:	N/A
Te	64.483	+/-	17.559
Sb	24.189	+/-	8.297
Sn	14.670	+/-	7.109
Cd	0	:	N/A
Ag	17.001	+/-	5.827
Pd	0	:	N/A
Nd	833.660	+/-	97.168
Pr	542.541	+/-	65.704
Ce	268.339	+/-	54.582
La	268.283	+/-	50.065
Bal	569863.813	+/-	2002.319
Nb	0	:	N/A
Y	0	:	N/A
Ta	0	:	N/A
Al	3056.458	+/-	1176.869
P	0	:	N/A
Si	9785.155	+/-	554.852
Mg	86697.359	+/-	9486.533



According to XRF test result:
Sample No 12 from Well No 15-2 is
Dolomitic Limestone Mg Ca $(Co_3)_2$

Address: House #100, Qasimi Alley, Next to Q Kabul, 40 Meter Rd, Kabul, Afghanistan
AISA: D-56729
TIN: 900 117 2 742
E-Mail:info@afghanite.net

MEMORANDUM

To: Zabi Sarwari, Gas Development Manager
Afghanistan Petroleum Authority
From: Stroud C. Kelley
Chief of Party, SGGA
cc: Dr. Qutbuddin Qaeym, Acting Director General, Afghanistan Petroleum Authority
Khalid Ludin, COR, USAID-Afghanistan
Jules Jordy, USAID- Afghanistan
Naihmatullah Kohsar, On-Budget Task Manager, SGGA
Date: 21 September, 2015
Re: Options for TPAO Drilling Contract Following Juma #2A Test Results

Purpose

This memorandum sets out the options for further operations under the TPAO drilling contract once the Juma #2A is tested.

Background

The Juma #2A well drilled for the Ministry of Mines and Petroleum by TPAO has reached total depth of 3481 meters and production casing has been installed and tested. Perforation of the well began on 20 September. Gas flow and pressure tests should begin this week.

Initial electric (gamma neutron) logs were obtained before casing was installed ("open hole" logs). Interpretation of the logs by TPAO indicated low porosity (5%) in the target Kugitan Formation. Porosity is an indicator of the ability of the rock to hold hydrocarbons (or other fluids). The 5% porosity is at the lower end of the range found in other Bashikurd Field wells and may mean that potential volumes of gas are low. Log and drilling data also indicated significant fracturing of the Kugitan in the #2A. These fractures may provide a mechanism for gas flow within the formation. No stimulation of the formation is planned due to the clear reluctance of TPAO to organize this common procedure.

After perforation, tests will be conducted to measure the flow of gas and the pressure characteristics of the formation. These tests, combined with log results and data from drilling, will provide data on which the commercial potential of the well will be estimated.

The drilling contract schedule currently calls for TPAO, after completion of work on the Juma 2A, to re-enter and test the Bashikurd Well #9 (approximately three kilometers south of the #2A), and to re-enter and deepen the Bashikurd Well #3 (approximately four kilometers to the west of the #2A) into the lower Kugitan Formation, not reached when the well was first drilled. Well #9 was perforated after it was drilled, but no test results have been located. Well #3 was tested in the upper Kugitan, and showed initial production of 93,312 cubic meters of gas per day and gas pressure of 324 atmospheres ("atm"), equivalent to 4608 pounds per square inch ("psi").

SGGA located rock samples ("cores") obtained during drilling from the Kugitan Formation in Bashikurd well #s 9, 10, and 15. These cores are being moved to Kabul, where SGGA will have them analyzed

for porosity in a local private laboratory. Wells # 10 and 15 showed good initial production results. The core analysis will provide comparative porosity data for the evaluation of the #2A.

Possible Results

One of three possible results (obviously) can be expected from testing the Juma #2A:

- Well tests clearly indicate commerciality in the judgment of Ministry engineers, supported by SGGA.
- Tests clearly indicate from initial production rates and pressure curves that the well does not have commercial potential.
- Indeterminate results.

Analysis of the well test results, together with data from the well logs, drilling, and core analysis from the Bashikurd #9, 10, and 15, will determine how the Juma 2A will be completed, i.e., either equipped for production or future production enhancement, or plugged and abandoned. In addition, analysis of this information should be used to determine the prospects for the success of subsequent operations in the Bashikurd #3 and 9 wells.

Options derived from review of the information available after testing the Juma 2A are outlined below. These options include consideration of the available budget.[1]

Poor 2A Test Results:

If (a) the Juma #2A test results are similar to the initial production reports from these nearby wells, which indicate marginal production:

- #3 (93,312 cubic meters per day = 3.3 MMcfd, 324 atm. BHP = 4608 psi)
- #6 (16,000 cubic meters per day on 8 mm choke = 0.6 MMcfd, no pressure report)

and
(b) the porosity characteristics for the #9 Kugitan reservoir are similar to the estimated 5% in the Juma 2A,

Then the cost of re-entering the #9 and re-entering and deepening the #3 might not be justified. If determined not to be justified, plans to re-enter the #9 and deepen the #3 should probably be dropped.

If those wells were to be dropped from the operations program, the following are possible options:

Option 1 would be to terminate operations and cancel the drilling/re-entry contract. Under a cancellation option, TPAO would be paid for the completion of the work on the #2A (US$18,313,307), plus termination for convenience costs of US$1,000,000 for demobilization. An open question would be whether TPAO would agree to keep the delivered special order casing, tubing, and wellhead equipment and drilling supplies for their future operations, or if those items should be purchased by the Ministry at a negotiated price.

Option 2 would be to change the operation plan to drill the twin well to the Juma #2 well. However, such a change might not be feasible for two main reasons.

[1] Total amount US$14,621,957 (Bashikurd #3, $12,030,887; Bashikurd #9, $2,592,070)

First, the originally plans for the twin well call for a total depth of 3500 meters, for which the cost of drilling, testing, and completing would be comparable to cost of the just drilled 3481 meter well. In addition, a new approximately seven kilometer road and a drilling location would need to be prepared. These costs would exceed the US$14.6 million savings from dropping the #3 and #9 wells.

Second, SGGA is informed that villages within five to seven kilometers of the original location planned for the Juma 2A well harbor significant numbers of insurgents. The attitude of the insurgents and other local residents toward drilling nearby and the possibility of attacks on drilling operations cannot be ascertained with certainty. Nonetheless, their presence has to be considered a significant security risk.

Satisfactory Juma 2A Test Results

If satisfactory initial production and pressure curve results are obtained from the Juma 2A, the next step in determining further operations on the #9 and #3 based on the available information, especially the comparison of porosity from core analysis. If the #9 core analysis shows comparable or better porosity, that well should likely be re-entered and tested. A decision on re-entry and deepening of the #3 should be based on the additional results obtained from a #9 re-entry.

Indeterminate Results

Juma #2A test results not clearly falling within either the poor or satisfactory categories will require a business judgement of both the Ministry and USAID using the information and possible options described above.

JUMA 2A PERFORATION & FLOW TEST DATA

Date	Hor	Time	Pwh	Twh	Pann	Tann	Pline	Tline	DİFF	GAS	GAS	NUM	RES. FLUID		REMARK
			(psig)	(˚C)	(psig)	(˚C)	(psig)	(˚C)	inH2O	(SM3/H)	(SM3/D)		(BBL)		
															End of TBG: 3190 m; WOD: 3441 m;Swab Depth: 2200 m;Water Cushion: 1734 psi - 81 bbl
19.09.2015	19:00														Wireline run in hole for GR - CCL (3110 - 3440 m)
	00:00														GR - CCL at surface
	08:55	0,00	0	28	0	18									Wireline run in hole to perforate the interval 3387 - 3390 m
	10:35	1,67	0	33	0	22									Fired guns to perforate interval 3387 - 3390 m
	10:40	1,75	0	33	0	24									Pulling wireline out of hole
	11:00	2,08	0	33	0	24									
	12:30	3,58	0	34	0	25									CCL & guns stuck iinto X-Mass tree
	14:00	5,08	0	34	0	26									CCL & guns retrieved from X-Mass tree
	14:05	5,17	0	35	0	27									No fired guns was detected
	16:30	7,58	0	31	0	26									Rigging up for the same perforation interval
	17:10	8,25	0	28	0	26									Wireline run in hole to perforate the interval 3387 - 3390
	18:26	9,52	1	25	0	25									Fired guns to perforate interval 3387 - 3390 m
	18:30	9,58	1	25	0	25									Pulling wireline out of hole
	18:34	9,65	1	25	0	25									
	18:40	9,75	1	25	0	25									
	18:50	9,92	1	25	0	25									
	19:00	10,08	3	24	0	24									
20.09.2015	19:10	10,25	4	24	0	24									
	19:20	10,42	4	23	0	23									
	19:30	10,58	6	23	0	23									
	19:40	10,75	6	22	0	23									Wireline at surface - Rig Down
	19:50	10,92	7	22	0	23									
	20:00	11,08	9	22	0	23									
	20:10	11,25	10	22	0	23									
	20:20	11,42	12	22	1	23									
	20:30	11,58	13	22	4	23									
	21:00	12,08	22	22	7	23									
	21:30	12,58	31	21	21	23									
	22:00	13,08	54	21	34	23									
	22:30	13,58	101	21	82	21									
	23:00	14,08	245	20	196	21									
	23:30	14,58	1020	20	1001	17									
	00:00	15,08	1018	20	998	15									
	00:30	15,58	1016	20	998	15									
	01:00	16,08	1014	18	998	12									
	01:30	16,58	1013	17	997	13									
	02:00	17,08	1012	16	996	13									
	02:30	17,58	1010	16	995	13									
	03:00	18,08	1009	15	996	13									
	03:30	18,58	1008	15	996	14									
	04:00	19,08	1008	14	976	14									
	04:30	19,58	1007	13	996	14									
	05:00	20,08	1006	13	994	14									
	05:30	20,58	1006	14	996	13									
	06:00	21,08	1005	13	996	13									
	06:30	21,58	1005	14	996	13									
	06:45	21,83	971	14	972	14									Wireline run in hole to perforate the interval 3384 - 3387 m
	06:50	21,92	998	14	996	14									

JUMA 2A PERFORATION & FLOW TEST DATA

Date	Hor	Time	Pwh	Twh	Pann	Tann	Pline	Tline	DİFF	GAS	GAS	NUM	RES. FLUID		REMARK
			(psig)	(˚C)	(psig)	(˚C)	(psig)	(˚C)	inH2O	(SM3/H)	(SM3/D)		(BBL)		
	07:00	22,08	995	14	996	14									
	07:10	22,25	996	14	996	14									
	07:20	22,42	1000	14	996	14									
	07:30	22,58	994	16	996	16									
	07:40	22,75	992	18	996	16									
	07:50	22,92	994	20	996	16									
	07:58	23,05	1002	21	995	16									
	07:59	23,07	1001	21	995	16									
	08:00	23,08	1001	21	995	16									
	08:01	23,10	1004	21	994	16									Fired guns to perforate interval 3384 - 3387 m
	08:02	23,12	1005	21	995	16									Pulling wireline out of hole
	08:03	23,13	1005	21	995	16									
	08:04	23,15	1005	21	995	16									
	08:05	23,17	1005	21	995	16									
	08:10	23,25	1005	22	994	16									
	08:20	23,42	1005	24	994	16									
	08:30	23,58	1005	24	994	16									
	08:40	23,75	1004	25	994	16									
	08:50	23,92	1002	25	992	16									
	09:00	24,08	1001	26	992	16									
	09:10	24,25	1001	26	994	17									
	09:20	24,42	1001	26	994	17									
	09:21	24,43	780	27	943	18									Wireline at surface, bleed off lubricator
	09:30	24,58	1002	27	995	18									
	09:40	24,75	1002	28	995	18									
	09:50	24,92	1002	30	995	19									Brine sample analysis: ph:7;65 lbm/cuft; salinity:34000 ppm
	09:57	25,03	1002	30	995	19									Full open cleaning flow
	09:58	25,05	15	30	41	19									
	09:59	25,07	10	30	19	19									
	10:00	25,08	7	30	12	19									
	10:01	25,10	4	30	7	19									Water sample taken from data header, ph:7;65 lbm/cuft;salinity:35000 ppm
	10:20	25,42	3	31	9	19									
	10:30	25,58	3	31	10	20									
	10:40	25,75	3	32	10	20									
	10:48	25,88	3	32	15	21									Water sample taken from data header, ph:7;65 lbm/cuft;salinity:35000 ppm
	10:50	25,92	22	32	30	21									well shut in at choke manifold
	10:51	25,93	32	33	35	21									
	10:52	25,95	42	33	49	21									
	10:53	25,97	54	33	59	21									
	10:54	25,98	67	33	73	21									
	10:55	26,00	83	33	88	21									
	11:00	26,08	235	33	294	21									
	11:10	26,25	643	33	670	21									
	11:20	26,42	992	34	999	22									Wireline run in hole to perforate the interval 3381 - 3384 m
	11:30	26,58	989	34	999	22									
	11:40	26,75	989	34	999	22									
	11:50	26,92	989	34	999	22									
	12:00	27,08	989	34	998	23									
	12:10	27,25	998	35	999	23									

JUMA 2A PERFORATION & FLOW TEST DATA

Date	Hor	Time	Pwh	Twh	Pann	Tann	Pline	Tline	DİFF	GAS	GAS	NUM	RES. FLUID		REMARK
			(psig)	(˚C)	(psig)	(˚C)	(psig)	(˚C)	inH2O	(SM3/H)	(SM3/D)		(BBL)		
21.09.2015	12:17	27,37	995	35	998	23									Fired guns to perforate interval 3381 - 3384 m
	12:18	27,38	995	35	996	23									
	12:19	27,40	998	35	996	23									Pulling wireline out of hole
	12:20	27,42	998	35	995	23									
	12:25	27,50	998	35	995	23									
	12:30	27,58	998	35	995	23									
	12:40	27,75	998	35	995	23									
	12:50	27,92	998	35	995	24									
	13:00	28,08	995	36	995	24									
	13:10	28,25	994	36	996	25									
	13:18	28,38	994	36	996	26									Wireline at surface, bleed off lubricator
	13:28	28,55	994	36	996	26									
	13:30	28,58	896	36	920	26									
	13:40	28,75	994	36	996	26									
	13:50	28,92	994	36	996	26									
	14:00	29,08	994	36	996	26									
	14:10	29,25	992	36	996	26									
	14:20	29,42	992	35	996	26									Wireline run in hole to perforate the interval 3378 - 3381 m
	14:30	29,58	988	35	999	27									
	14:40	29,75	986	35	1002	27									
	14:50	29,92	991	35	1009	28									
	15:00	30,08	998	36	1018	28									
	15:10	30,25	1011	36	1023	29									
	15:15	30,33	1002	35	1007	29									Fired guns to perforate interval 3378 - 3381 m
	15:16	30,35	1001	35	1006	29									
	15:17	30,37	999	35	1004	29									
	15:18	30,38	998	34	999	29									Pulling wireline out of hole
	15:19	30,40	995	34	994	29									
	15:20	30,42	991	34	992	29									
	15:30	30,58	988	31	989	28									
	15:40	30,75	988	31	989	28									
	15:50	30,92	988	31	989	28									
	16:00	31,08	985	33	988	28									
	16:10	31,25	988	34	994	28									
	16:13	31,30	988	34	994	28									Wireline at surface, bleed off lubricator
	16:20	31,42	676	35	687	28									
	16:30	31,58	959	35	970	28									
	16:40	31,75	989	35	995	29									
	16:50	31,92	988	33	995	30									
	17:00	32,08	712	33	759	30									Wireline run in hole to perforate the interval 3375 - 3378 m
	17:10	32,25	982	31	996	30									
	17:20	32,42	985	30	1002	30									
	17:30	32,58	990	30	1008	30									
	17:40	32,75	994	30	1014	29									
	17:50	32,92	1003	28	1014	28									
	17:58	33,05	1009	28	1008	28									Fired guns to perforate interval 3375 - 3378 m
	17:59	33,07	998	28	1005	28									
	18:00	33,08	995	28	1002	28									Pulling wireline out of hole
	18:01	33,10	992	28	998	28									

JUMA 2A PERFORATION & FLOW TEST DATA

Date	Hor	Time	Pwh	Twh	Pann	Tann	Pline	Tline	DİFF	GAS	GAS	NUM	RES. FLUID		REMARK
			(psig)	(˚C)	(psig)	(˚C)	(psig)	(˚C)	inH2O	(SM3/H)	(SM3/D)		(BBL)		
	18:02	33,12	989	28	996	28									
	18:03	33,13	988	28	989	28									
	18:05	33,17	985	28	986	28									
	18:10	33,25	983	27	986	27									
	18:20	33,42	985	27	988	27									
	18:30	33,58	982	27	986	27									
	18:40	33,75	980	26	989	26									
	18:50	33,92	980	26	991	26									
	19:00	34,08	985	25	994	26									
	19:06	34,18	985	25	994	26									Wireline at surface, bleed off lubricator
	19:20	34,42	873	25	902	25									
	19:22	34,45	944	25	968	25									Full Open Cleaning flow
	19:30	34,58	6	25	20	25									
	19:40	34,75	3	25	20	25									
	19:50	34,92	3	25	26	25									
	20:00	35,08	3	24	26	25							1,51 bbl/hour		Water sample taken from data header, ph:7;65 lbm/cuft;salinity:36000 ppm
	20:30	35,58	4	24	36	25									
	21:00	36,08	3	24	36	25									
	21:30	36,58	4	24	58	25									well shut in at choke manifold
	22:00	37,08	477	23	480	22									
	22:30	37,58	995	21	1011	21									
	23:00	38,08	995	21	1011	21									
	23:30	38,58	995	20	1009	20									
	23:40	38,75	995	20	1009	20									Full open cleaning flow
	23:41	38,77	38	19	104	20									
	00:00	39,08	3	19	15	20									
	00:30	39,58	3	19	78	20									well shut in at choke manifold
	01:00	40,08	528	19	532	20									
	01:30	40,58	998	19	1014	19									Full open cleaning flow
	01:35	40,67	17	19	81	19									Water sample taken from data header, ph:7;66 lbm/cuft;salinity:52000 ppm
	02:00	41,08	3	19	68	19									well shut in at choke manifold
	02:30	41,58	530	19	534	19									
	03:00	42,08	998	19	1015	19									Full open cleaning flow
	03:30	42,58	3	19	74	19									
	04:00	43,08	725	19	756	19									well shut in at choke manifold
	04:30	43,58	1001	19	1017	19									Full open cleaning flow
	05:00	44,08	1	19	73	19									Water sample taken from data header, ph:7;66 lbm/cuft;salinity:50000 ppm
	05:30	44,58	497	19	522	19									well shut in at choke manifold
	06:00	45,08	1002	19	1018	19									Full open cleaning flow
	06:30	45,58	3	19	67	19									well shut in at choke manifold
22.09.2015	07:00	46,08	334	19	336	19									Water sample taken from data header, ph:7;66 lbm/cuft;salinity:50000 ppm
	07:30	46,58	1002	19	1010	19									
	07:38	46,72	852	19	858	19									Wireline run in hole to perforate the interval 3372 - 3375 m
	07:50	46,92	996	23	1012	20									
	08:00	47,08	996	23	1020	20									
	08:15	47,33	995	25	1018	21									
	08:30	47,58	992	27	1018	21									
	08:38	47,72	1002	27	1018	21									Fired guns to perforate interval 3372 - 3375 m
	08:39	47,73	1002	27	1012	21									

JUMA 2A PERFORATION & FLOW TEST DATA

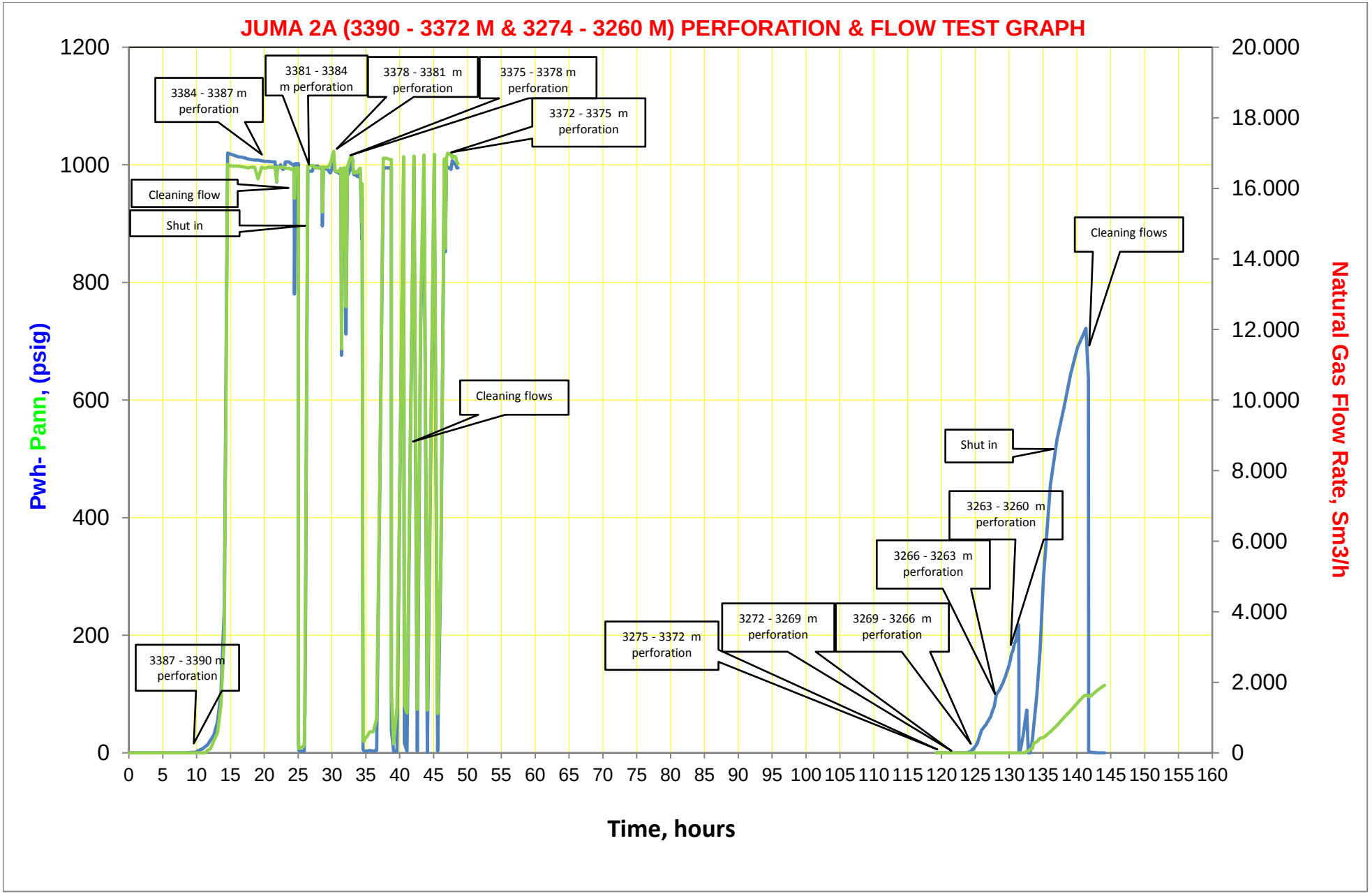
Date	Hor	Time	Pwh	Twh	Pann	Tann	Pline	Tline	DİFF	GAS	GAS	NUM	RES. FLUID		REMARK
			(psig)	(˚C)	(psig)	(˚C)	(psig)	(˚C)	inH2O	(SM3/H)	(SM3/D)		(BBL)		
	08:40	47,75	1007	27	1015	21									Pulling wireline out of hole
	08:50	47,92	1005	29	1015	22									
	09:00	48,08	1002	29	1014	22									
	09:10	48,25	1002	29	1014	22									
	09:20	48,42	995	30	1005	22									
	09:30	48,58	995	30	1002	22									Wireline at surface, bleed off lubricator
23.09.2015	00:00	63,08													Plug cementing operation
24.09.2015	00:00	63,08													End of TBG: 3192 m; WOD: 3310 m;Swab Depth: 2100 m;Water Cushion: 1750 psi - 90 bbl
	08:10	119,25	0	24	0	20									Wireline run in hole to perforate the interval 3275 - 3272 m
	09:26	120,52	0	29	0	21									Fired guns to perforate interval 3275 - 3272 m
	09:31	120,60	0	29	0	21									Pulling wireline out of hole
	09:40	120,75	0	28	0	21									
	09:50	120,92	0	28	0	22									
	10:00	121,08	0	28	0	22									
	10:10	121,25	0	28	0	22									
	10:20	121,42	0	28	0	22									Wireline at surface, bleed off lubricator
	10:55	122,00	0	30	0	23									Wireline run in hole to perforate the interval 3272 - 3269 m
	11:10	122,25	0	30	0	24									
	11:20	122,42	0	30	0	24									
	11:30	122,58	0	30	0	24									
	11:40	122,75	0	30	0	24									
	11:47	122,87	0	30	0	24									Fired guns to perforate interval 3272 - 3269 m
	11:53	122,97	0	30	0	24									Pulling wireline out of hole
	12:20	123,42	0	32	0	25									
	12:40	123,75	0	33	0	25									Wireline at surface, bleed off lubricator
	13:20	124,42	3	33	0	26									Wireline run in hole to perforate the interval 3269 - 3266 m
	13:30	124,58	6	32	0	27									
	13:40	124,75	6	32	0	27									
	13:50	124,92	10	33	0	27									
	14:00	125,08	12	34	0	27									
	14:10	125,25	16	32	0	28									Fired guns to perforate interval 3269 - 3266 m
	14:11	125,27	16	35	0	28									
	14:12	125,28	17	35	0	28									
	14:13	125,30	17	35	0	28									
	14:14	125,32	17	35	0	28									
	14:15	125,33	19	35	0	28									Pulling wireline out of hole
	14:20	125,42	20	35	0	28									
	14:30	125,58	26	35	0	28									
	14:40	125,75	33	35	0	28									
	14:50	125,92	39	35	0	28									
	15:00	126,08	41	35	0	28									Wireline at surface, bleed off lubricator
	15:10	126,25	44	37	0	28									
	15:20	126,42	46	37	0	29									
	15:30	126,58	48	36	0	29									
	15:40	126,75	52	36	0	28									
	15:50	126,92	55	36	0	28									Wireline run in hole to perforate the interval 3266 - 3263 m
	16:00	127,08	58	36	0	28									
	16:10	127,25	61	36	0	28									
25.09.2015	16:20	127,42	67	36	0	28									

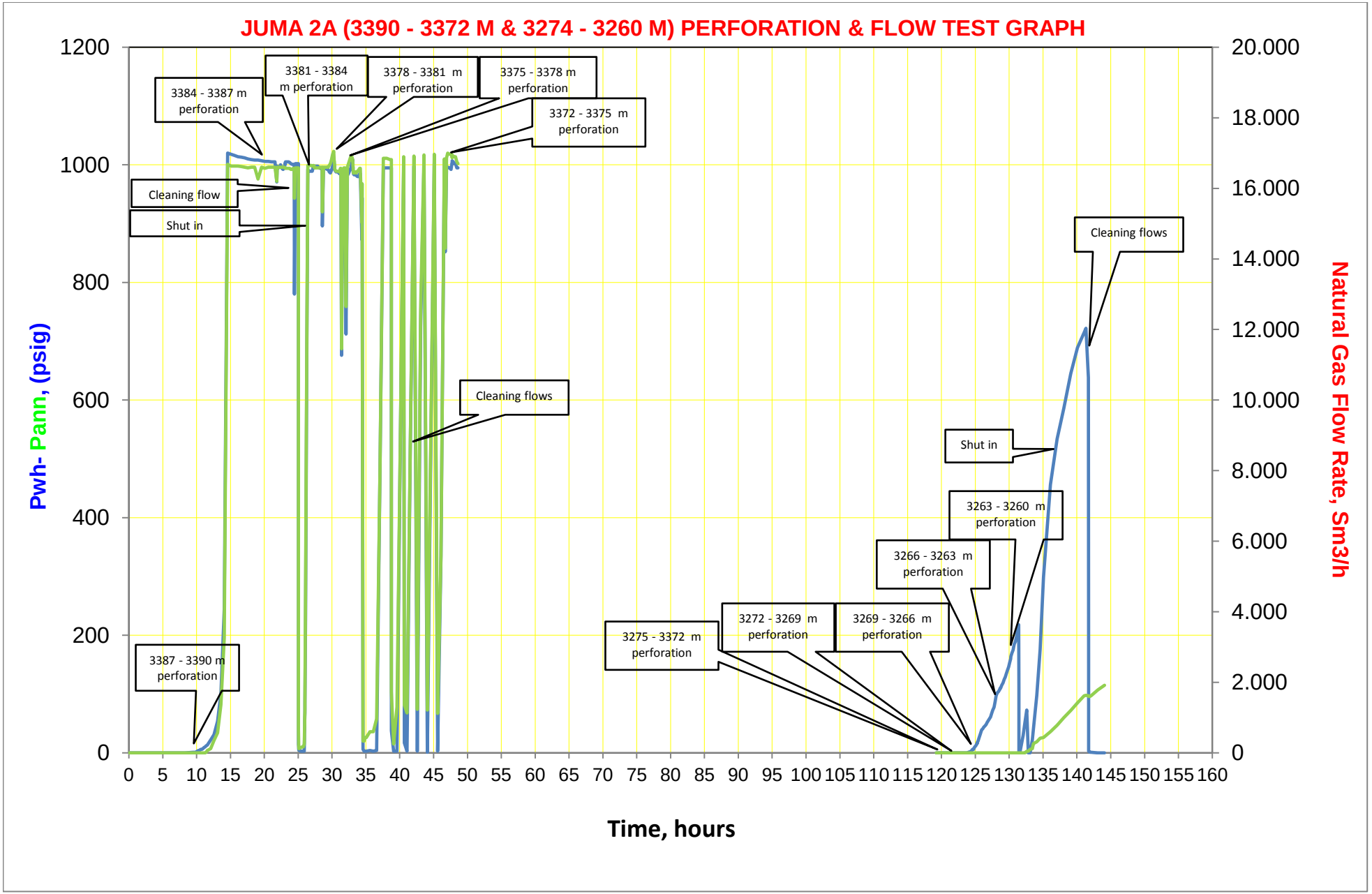
JUMA 2A PERFORATION & FLOW TEST DATA

Date	Hor	Time	Pwh	Twh	Pann	Tann	Pline	Tline	DİFF	GAS	GAS	NUM	RES. FLUID		REMARK
			(psig)	(˚C)	(psig)	(˚C)	(psig)	(˚C)	inH2O	(SM3/H)	(SM3/D)		(BBL)		
25.09.2015	16:30	127,58	73	35	0	28									
	16:40	127,75	77	35	0	28									Fired guns to perforate interval 3266 - 3263 m
	16:42	127,78	78	32	0	28									Pulling wireline out of hole
	16:50	127,92	86	32	0	28									
	17:00	128,08	97	32	0	28									
	17:10	128,25	102	30	0	30									
	17:20	128,42	104	30	0	30									
	17:30	128,58	107	30	0	30									
	17:35	128,67	110	30	0	30									Wireline at surface, bleed off lubricator
	17:40	128,75	110	28	0	28									
	17:50	128,92	115	26	0	27									
	18:00	129,08	119	25	0	26									
	18:10	129,25	125	25	0	26									
	18:20	129,42	129	24	0	26									Wireline run in hole to perforate the interval 3263 - 3260 m
	18:30	129,58	135	24	0	25									
	18:40	129,75	141	23	0	25									
	18:50	129,92	146	23	0	24									
	19:00	130,08	154	22	0	24									
	19:08	130,22	160	22	0	24									Fired guns to perforate interval 3263 - 3260 m
	19:10	130,25	164	22	0	23									Pulling wireline out of hole
	19:20	130,42	170	22	0	23									
	19:30	130,58	175	21	0	23									
	19:40	130,75	185	21	0	23									
	19:50	130,92	189	21	0	23									
	20:00	131,08	197	21	0	22									Wireline at surface, bleed off lubricator
	20:10	131,25	210	20	0	22									
	20:20	131,42	218	20	0	22									Cleaning flow
	20:21	131,43	110	20	0	22									
	20:22	131,45	1	20	0	22									
	20:23	131,47	0	20	0	22									
	20:30	131,58	0	20	0	22									Shut in
	20:45	131,83	16	20	0	21									
	21:00	132,08	30	20	0	21									
	21:15	132,33	52	20	0	21									
	21:30	132,58	73	19	3	20									Full open cleaning flow
	21:45	132,83	0	19	3	20									
	22:00	133,08	0	18	6	20									Shut in at choke manifold
	22:20	133,42	22	17	7	19									
	22:30	133,58	41	17	16	17									
	23:00	134,08	98	17	19	17									
	23:30	134,58	176	17	25	17									
	00:00	135,08	299	17	26	17									
	01:00	136,08	456	17	36	16									
	02:00	137,08	534	17	47	16									
	03:00	138,08	586	17	60	15									
	04:00	139,08	645	15	72	14									
	05:00	140,08	689	15	85	14									
	06:00	141,08	715	17	97	14									
	06:15	141,33	722	21	98	19									Full open cleaning flow

JUMA 2A PERFORATION & FLOW TEST DATA

Date	Hor	Time	Pwh	Twh	Pann	Tann	Pline	Tline	DİFF	GAS	GAS	NUM	RES. FLUID		REMARK
			(psig)	(˚C)	(psig)	(˚C)	(psig)	(˚C)	inH2O	(SM3/H)	(SM3/D)		(BBL)		
26.09.2015	06:38	141,72	638	21	97	19									
	06:39	141,73	152	21	96	19									
	06:40	141,75	3	21	96	19									
	06:50	141,92	1	21	96	19									
	07:00	142,08	1	21	97	19									Swab operation preparation
	08:00	143,08	0	21	107	19									
	09:00	144,08	0	21	115	19									Swab Depth: 600 meter
	07:30														
	07:40														


JUMA 2A (3390 - 3372 M & 3274 - 3260 M) PERFORATION & FLOW TEST GRAPH
Pwh- Pann, (psig)
Natural Gas Flow Rate, Sm3/h
Time, hours
3384 - 3387 m perforation
3381 - 3384 m perforation
3378 - 3381 m perforation
3375 - 3378 m perforation
3372 - 3375 m perforation
Cleaning flow
Shut in
Cleaning flows
3387 - 3390 m perforation
3275 - 3372 m perforation
3272 - 3269 m perforation
3269 - 3266 m perforation
3266 - 3263 m perforation
3263 - 3260 m perforation
Shut in
Cleaning flows


JUMA 2A (3390 - 3372 M & 3274 - 3260 M) PERFORATION & FLOW TEST GRAPH
Pwh- Pann, (psig)
Natural Gas Flow Rate, Sm3/h
Time, hours
3384 - 3387 m perforation
3381 - 3384 m perforation
3378 - 3381 m perforation
3375 - 3378 m perforation
3372 - 3375 m perforation
Cleaning flow
Shut in
Cleaning flows
3387 - 3390 m perforation
3275 - 3372 m perforation
3272 - 3269 m perforation
3269 - 3266 m perforation
3266 - 3263 m perforation
3263 - 3260 m perforation
Shut in
Cleaning flows