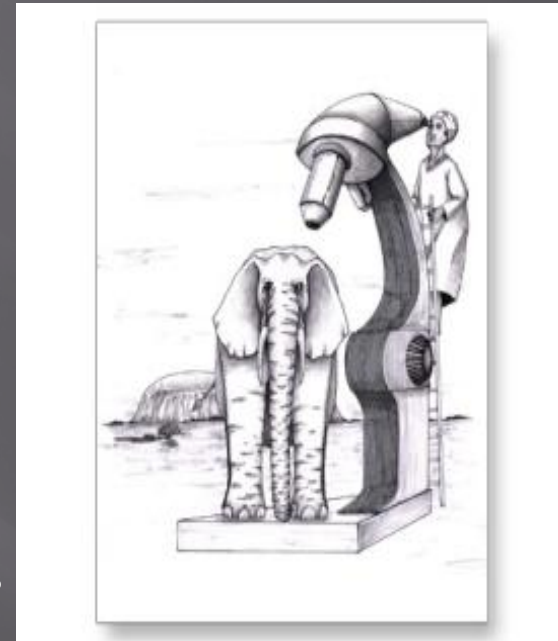


The Wellsite Geologist

▣ Responsible for all geology and geologically related administrative wellsite activity.

1. Describing cuttings and maintaining a current lithology log.
2. Interpreting and reporting **hydrocarbon shows**
3. Supervise carbide lag checks, Butane Propane lag checks, lag time checks, flow checks.
4. Comparing data gathered during drilling with:
 - a) Predictions made at the exploration stage &
 - b) The nearest offset well
5. Analysing, evaluating and describing formations while drilling, using cuttings, gas, FELWD (formation evaluation logging while drilling) and wireline data.
6. Participating in casing, core and TD determination



The Wellsite Geologist

2. **Supervision** of “Formation Evaluation” **contractors** (Mud Logging Geologists, LWD Logging Engineers, Wireline Logging & coring Engineers).

- Monitoring and supervising the collecting, processing and dispatching of formation evaluation samples
- Maintaining current QC reports on Service Companies
- Checking all reports and logs from the evaluation contractors prior to sending them to oil company offices
- Wire line logging witness & E-logs evaluation.
- All safety aspects for the well and personnel during these evaluation operations



Well Prognosis

- ▣ Name of the Well
- ▣ Type of Well
- ▣ Location of drill site
- ▣ Expected total depth of the well
- ▣ Types and thicknesses and depths of formations to be drilled
- ▣ Primary and Secondary Objectives
- ▣ Casing Points
- ▣ Correlation and Detection of Marker Horizons with offset well.
- ▣ Selection of Logging Run Intervals

▣ Note:

Mudlogs, wireline logs, geological maps & seismic lines should be used as sources of information.

**1. Describing cuttings and
maintaining a current
lithology log.**

Sample Collections

- Samples can be **obtained** from several sources at the rig site:
 - **Shale Shakers.**
 - **Desanders, Desilters and Mud-Cleaners (not lagged).**
 - **Flowline and Possum Belly (Gas detection & mud properties).**
- At the shale shaker, it is essential that the geologist know the **shaker screen sizes**, and the **grain-size** of the cuttings that can be recovered from each screen.
- In case of **Water Base Mud**; samples should be washed by **water**.
- In case of **Oil Base Mud**; samples should be washed by
 1. **Diesel** to remove the **OBM**, then by
 2. **Detergent** “liquid soap” to remove the **diesel**, then by
 3. **Water** to remove the **soap**.



Sample Description

➤ Samples are examined under a microscope for:

- 1) **Lithology**
- 2) **Oil Staining**
- 3) **Porosity**

The objective is to depict changes of lithology and appearance of new formations:

- Determine the different **types** and **percentages** of each **rock type** in the sample.
- Describe the most **abundant** rock type at **first**, then the **lesser one**.

A cuttings description has two major functions:

1. It allows to understand the **components** and **structure** of the rock and to draw conclusions as to the **source, depositional environment, and** subsequent **history of the formation**.

➤ The description format should be followed as:

- | | |
|--|-----------------------------------|
| 1. Rock type and classification | 5. Cement or matrix |
| 2. Color | 6. Fossils and accessory minerals |
| 3. Texture, including size, shape, sorting | 7. Sedimentary structures |
| 4. Hardness | 8. Porosity |
| | 9. Oil shows |

Sample Description

➤ Color:

- Color can be a useful indicator of depositional environment:

Red, Yellow & Brown:

Ferric iron, an oxidizing environment

Green & Grey:

Ferrous iron, a reducing environment

Dark Brown:

Organic material, possible source rock

Black:

An anaerobic environment

- **When describing color, distinguish between:**

a) Rock Particles

c) Matrix & Cement.

b) Staining

d) Accessories.

Common colours:

CLSS, WH, OFF WH, GYSH WH, GNSH WH, YLSH WH, TNSH WH, BNSH WH, CRMY WH, MLKY WH, SNOW WH, SMKY WH.

BNSH GY, GNSH GY.

(DK- M- LT) BN (OIL SHOWS)

(DK, M, LT) GY.

BRKSH RD.

OLV GN

COFFE BN.

HNY BN.

Sample Description

▣ Grain Texture (Size, Shape & Sorting):

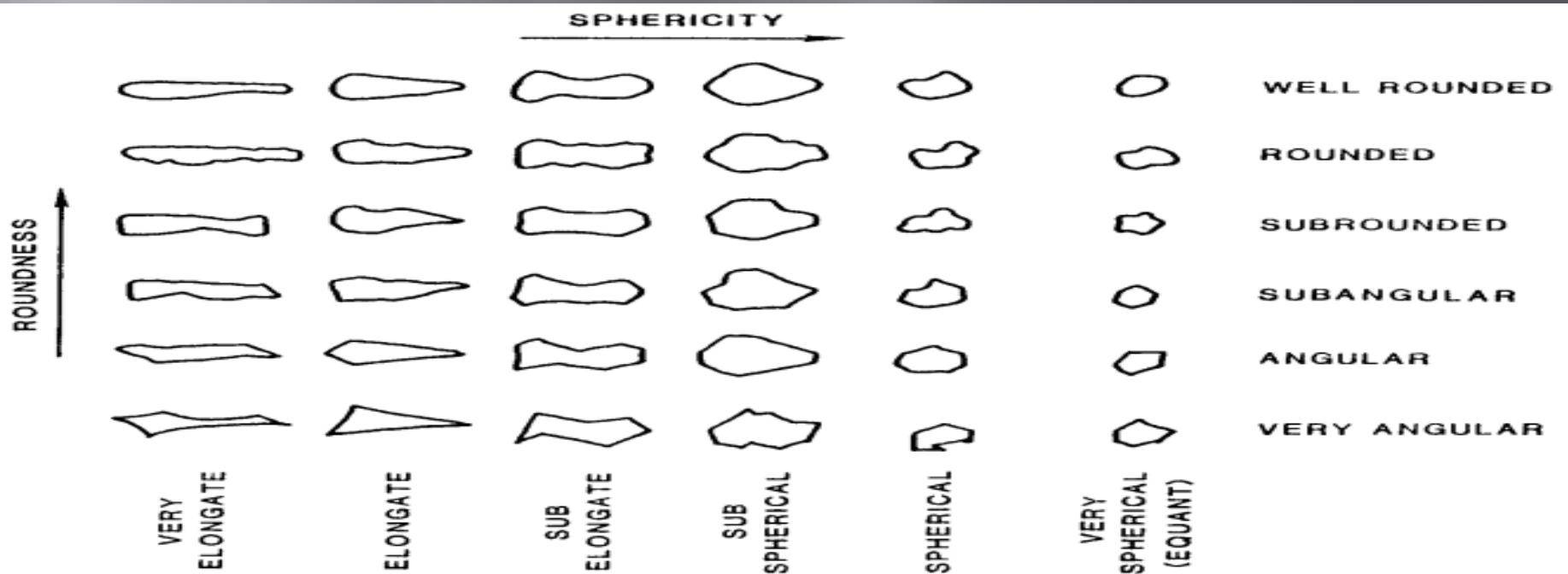
They give **clues** to several important **geologic parameters**:

1. **Mode** and distance of **transport**.
2. **Porosity and permeability**.

▣ Grain size ranges from:

V C - C - F - V F GR

▣ Grain shape:



Sample Description

- Grain Texture (Size, Shape & Sorting):

- Sorting:

Sorting is a measure of dispersion of the **size** frequency **distribution** of grains in a sediment or rock.

WELL SRTD: 90% in 1 or 2 size classes

MOD SRTD: 90% in 3 or 4 size classes

ILL SRTD: 90% in 5 or more size classes

- The grain size & sorting **cannot** be determined for rocks of **very fine grain size** (SH & SLTST).

- The grain shape of **SH**:

FLKY– SBFLKY– SBBLKY – BLKY→CLAY

- The grain shape of **SLTST**:

- BLKY- SBBLKY- SBFLKY.

- In case of **Non- clastic** rocks, only the **crystalline shape (texture)** can be determined.

F XLN – MICXLN – CRPXLN

SUCC TXT

Sample Description

- ▣ Hardness:
- ▣ It is the amount of **force** required to **break** apart the cutting, using a **sample probe**.
- ▣ Sandstone:
FRI – SEMI CONS – CONS
- ▣ Shale:
SFT – MOD FIRM – FIRM
- ▣ Siltstone:
HD – MOD HD – SFT
- ▣ Non- Clastics:
HD – MOD HD – SFT

Sample Description

Cement or Matrix:

- ▣ **Cement**: is a **chemical precipitate** deposited around the grains and in the interstices of sediment as aggregates of crystals or as growths on grains of the same composition.
- ▣ **Matrix**: consists of small individual grains that **fill intersections** between the larger grains.
- ▣ **Cement is deposited chemically and matrix mechanically.**
- ▣ The difference between cement & matrix cannot be recognized easily in the sample.
- ▣ Sandstone:

SIL, CALC, DOL, ARG, RR HEMATITIC

- ▣ Siltstone: (Contamination)

CALC, DOLC, SIL

- ▣ Shale: (Contamination)

CALC

- ▣ Limestone: (Contamination)

DOLC, ARG

- ▣ Dolomite: (Contamination)

ARG

Sample Description

Fossils and accessory minerals

- ▣ It is a significant **indicators** of the **environment of deposition**, as well as **clues to correlation**.
- ▣ The most common accessories are **glauconite, pyrite, feldspar, mica, siderite, carbonized plant remains (coal), chert & kaolinite**.
- ▣ This accessories may be **free or disseminated**.

Sedimentary Structure:

- ▣ Most sedimentary structures are **not discernible** in cuttings. On the other hand; one or more of them can **be found** in the **core sample** and they should be reported in the description.

Sample Description

Porosity:

- ▣ Porosity is a measure of the **volume of void** spaces in a rock.
- ▣ Although the magnification of about **10^x** is adequate to detect porosity, **higher magnification** is often necessary.
- ▣ Pores are **easier** to recognize in **dry samples** than in wet ones.
- ▣ In **siliclastics**; The **intergranular** porosity is the most common type and most rapidly seen in cuttings.

P, F, G POR

- ▣ In **carbonate** rocks, **vuggy** porosity is the most common one.

P, F, G INTXLN POR

N VIS POR (COMMON)

VUGGY POR

Sample Description

- ❑ **Evaporate** sections drilled with **water based mud** will dissolve completely in the mud. It can be recognized by:
 1. Evaporates generally have consistent **drill rates**.
 2. **Gas value** through evaporates will be very **low**.
 3. **Poor** or no returns on the shale shaker.
 4. Limestone and Dolomite are frequently found in association with evaporates.
 5. The Cl “Chloride” content of the drilling fluid will increase significantly.
- ❑ **Important tests for lithology identification:**
 1. **Calcimetry test :**

This test is designed to provide the geologist with the percentage of calcite and dolomite in carbonate samples.
 2. **Barium chloride test :**

Anhydrite sections can be identified by **BaCl₂** solution which produces **BaSO₄** precipitate (white ppt).

Sample Description Forms



- B. Read this descriptions carefully & notice the description arrangement:
1. **LST:** OFF WH, TNSH WH, MIC -CRPXLN, MOD HD, FOSS, N VIS POR, NS.
 2. **SLTST:** BNSH GY, OFF WH, SBBLKY- BLKY, SFT- MOD HD, OCC PSTD, ARG, W/ TR OF FREE PYR.
 3. **SH:** M- DK GY, OCC BNSH GY, SBFLKY- FLKY, MOD FRM- FRM, W/ TR OF FREE & DISM PYR, N CALC.
 4. **SST:** GYSH WH, BNSH WH, F-V F GR, SB RD-SB ANG, MOD CONSL, W/ ARG CMT, SLTY, OCC SIL CMT, GLAUC, W/ TR PATCHY-SPOTY LT BN OSTN, PAL YL FLU, V SLW-N STMG CUT, N CRUSH CUT, NRR.
 5. **DOL:** OFF WH, GYSH WH, MICXLN, MOD HD- SFT, SUCC TXT, PR INTRXLN POR, NS.
 6. **SD:** CLSS, TRNSP, F- M GR, SBANG- SBRD, MOD SRTD, **PARTIALY CONSL TO SST:** OFF WH, M- F GR, MOD SRTD, SBRD- SBANG, MOD CONSL, W/ SIL CMT, P POR, NS.
 7. **SH:** GNSH GY, BNSH GY, SBBLKY- SBFLKY, FRM- MOD FRM, OCC SLTY, W/ TR OF FREE PYR, N CLAC.

Sample Description Forms

B. Read this descriptions carefully & notice the description arrangement:

9. **SST:** LT- M BN, TNSH WH, F- M GR, OCC V F GR, MOD SRTD, SBRD, MOD CONSL, P POR, W/ TR OF LT BN SPOTY- UNIF OSTN, V PL YL FLU, SLW YLSH WH STMG CUT, N CR CUT, NRR.
10. **LST:** GYSH WH, OCC BN, OFF WH, CRPXLN, MOD HD- SFT, HI ARG, N VIS POR, NS.
11. **DOL:** LT- M BN, CRPTXLN, MOD HD- HD, P INTXLN POR, NS.
12. **SD:** CLSS, TRNSP, RR TRANSL, F- M GR, MOD SRTD, SBRD- SBANG, **RR CONSL TO SST:** TNSH WH, OCC OFF WH, M GR, RR C GR, MOD SRTD, SBANG- SBRD, W/ SIL CMT, RR CALC, KAOLC, MOD CONSL- SEMI FRI, W/ TR OF FREE PYR & DISM GLAU, P POR, NS.
13. **LST:** COFF BN, BNSH WH, OCC OFF WH, CRP- MICXLN, MOD HD- SFT, N VIS POR, NS.
14. **SST:** OFF WH, OCC BNSH WH, V F GR, MOD SRTD, SBANG- SBRD, MOD CONSL- SEMI FRI, OCC CONSL, W/ SIL CMT, OCC SLTY, F POR, W/ BNSH WH, PTCHY- UNIF OSTN, PL YL FLU, CLOUDY BLUSH WH, V SLW STRMG CUT, F CRUSH CUT, NRR.
LOSEND T/ SD: CLSS, TRANSP- TRANSL, M- F GR, C GR I/P, MOD SRTD, SBRD- SBANG, W/ TR OF FREE KAO.

Sample Examination

- There are many potential sources of **contamination** when undertaking estimates of lithology percentages:
 1. **Caving:** Cuttings from **previously drilled intervals** rather than from the bottom of the hole. It has **two** types:
 - a) **Mechanical caving:** due to drill string collision with the hole during drilling, and usually being blocky in shape.
 - a) **Pressurized caving:** due to the difference in pressure between the mud column and the formation pore pressure.
 2. **Recycled cuttings:** are recognized as being **small, abraded, rounded** rocks fragments in the sample.

Sample Examination

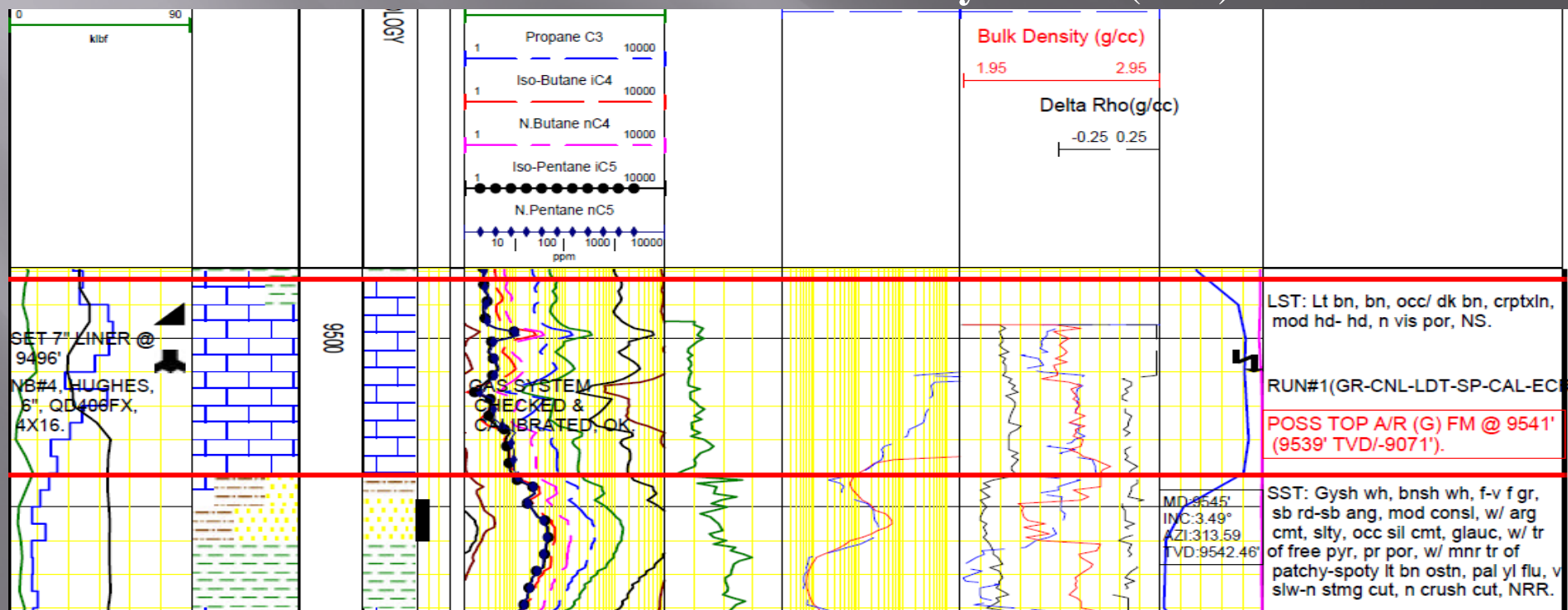
3. **Mud chemicals:** such as L.C.M. “Lost Circulation Material”, Bentonite, asphaltic matter & calcium carbonate.
4. **Cement:** may be **mistaken** for **Siltstone**, but is readily identified by testing with **Phenolphthalein** solution, its high PH will give a purple color.
5. **Metal:** originates from **wearing** the inside of the **casing** by the drill string, so we use rubber drill pipe protectors . Other sources of metal fragments are **bits**.

2. Interpreting and reporting hydrocarbon shows

Oil Shows Description

Indicators of the presence of hydrocarbons:

1. Fast ROP
2. Increase in the readings of total gas & chromatograph.
3. Presence of reservoir lithology (SST, LST, DOL).
4. Low gamma ray curve.
5. High resistivity curve (separation between curves in the wireline logging)
6. Presence of cross over between neutron & density curves (SST).



Oil Shows Description

A. Under microscope:

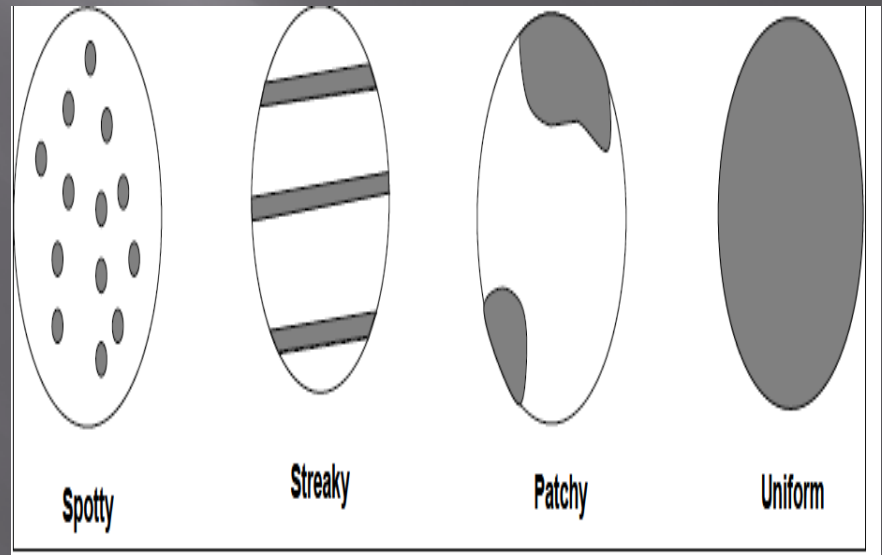
- Oil Stain (OSTN):

- The **color** of the stain is related to the oil's **API gravity**.
- A **light colored** stain being indicative of a **high gravity** oil and a **dark stain** indicative of a **low gravity oil**.

- **Colour:** (LT, M, DK) BN, BNSH WH, TNSH WH.

- **Shape:** UNIF, PATCHY, PIN POINT.

- Remember, oil-base muds will cause the sample chips to be oil soaked.



Oil Shows Description

B. In UV box:

- Fluorescence (FLU):
- The **intensity and color** of oil fluorescence is a useful indicator of **oil gravity**.
- A **low/dull intensity** and **darker color** commonly accompany **decreases in gravity**.

Colour: (PL, DULL, GLDN) YL, YLSH WH.



Oil Shows Description

B. In UV box:

- Streaming cut:(STMG CUT):

- When a **solvent**, such as **chloroethene** is added to the sample, oil will visibly be leached out.

Velocity: FAST, MOD FAST, SLOW.

Colour: YLSH WH, BLUSH WH.

Shape: (RADIAL, CLOUDY) STMG CUT.

- Low permeable rocks, will cut more slowly, with radial shape than high permeable rocks.

- Crush cut:

- Crush the grain by the forceps and note the changes in the stream.

G, P, FR, N (CRUSH CUT)

C. Out off UV:

- Residual ring:

- When the solvent evaporates, a residual ring may form around the crushed sample.

(LT, M, DK) BN RR.

N RR.

Oil Shows Description

• Miscellaneous tests For hydrocarbons

Acetone Test

1. The sample is **washed** slightly and **dried naturally**.
2. About **10 cc** of sample is placed in a **test tube** and a pure **acetone is added**.
3. After shaking, **20-30 cc. of distilled water** is added,
4. If oil is present, the **liquid turns milky**.

Hot Water Test

1. Place **20-30 cc.** of sample in a **clean baker**
2. **cover** the sample completely with **hot water (167°F or 75°C)**.
3. Allow the mixture to **stand** for several **minutes**.
4. If oil is present, it will **float on the surface of the water**. Check with the **ultraviolet light** and solvents.

Oil Shows Description

- Miscellaneous tests For hydrocarbons

Acid Test

1. This test is **only** valid for **carbonate** reservoir rocks.
2. Place a **quantity** of **10% HCL** hot acid in a **test tube** and **drop a cutting** into the tube.
3. **If** the cutting **contains oil** it will **bounce** on the acid and often **leaves an oil residue** on the **wall** of the test tube.
4. **Check** this oily **residue** for **fluorescence** and cut.

NOTE

During description:

- ▶ The common property written first, then the less one.
- ▶ **OCC** → means that the property found in the entire samples group but with small percent.
- ▶ **I/P** → means that the property found in some of the samples with small percent.
- ▶ **RR** → means that the property found in few samples with small percent.
- ▶ For low percent accessories → W/ TR OF.....

**3. Supervise lag time checks &
gas system check.**

Gas System Calibration & Check cycle

Important test to check the efficiency of the total gas & chromatograph instruments by using standard gas cylinders & sometimes by using carbide.



Lag Time

- **Lag time:** is the **time** the **mud** takes to **travel** inside the hole between two specified depth **points**.
- **Lag Down/ Lag In:** The **time** taken between the **surface** to the **bottom** of the hole.
- **Lag Up/ Bottoms up:** The **time** taken between the **bottom** of the hole to the **surface**.
- The **surface to surface** time is called “**Complete cycle**” or **In/Out time**.
- **The factors that affect the lag time:**
 1. The **flow rate** of the mud,
 2. The **configuration** of the well;
 3. The **sizes and depths** of the different **hole** sections, and
 4. The drill **string** sections’ **dimensions**.

Lag Time Calculation

Casing I.D. = 9.00"
Drillpipe O.D. = 5.00"
Drillpipe I.D. = 4.276"
Length = 6000 ft

Open Hole I.D. = 8.50"
Drillpipe O.D. = 5.00"
Drillpipe I.D. = 4.276"
Length = 350 ft

Open Hole I.D. = 8.50"
Drill Collar O.D. = 7.00"
Drill Collar I.D. = 3.50"
Length = 1400 ft

Section
1

Section
2

Section
3

9 5/8" Casing
H-40 32.30 lbs/ft

6000 ft Csg Shoe

8 1/2" Bit Size

7750 ft T.D.

Figure 1-3: Well Model for Lag Time Calculations

Lag Time Calculation

- ▣ **Volume Method** – using annular volume (bbls)

$$\text{Annular vol.} = (\text{ID}^2 - \text{OD}^2) \times \text{L} / 1029$$

Where:

Q: Flow rate (gpm).

ID: Inside Diameter (Borehole OR Casing) (inches).

OD: Outside Diameter (Drill pipe OR Drill Collar)(inches).

L: Length of annular section (feet).

$$\text{Pipe Vol.} = \text{ID}^2 \times \text{L} / 1029$$

ID²: Inside Diameter (Pipe OR Collar)

L: Length of Drill String (feet).

$$\text{Lag-in strokes} = \text{Annular Vol.} / \text{Pump output}$$

$$\text{Lag- in minutes} = \text{Lag-in strokes} / \text{Pump Rate}$$

Lag Time Calculation

- Pump information

Pump output = 0.123 bbls/stroke

Pump rate = 75 spm

- Drill string information

Drillpipe : 5" OD 4.276" ID L: 8075'

Heavy-weight: 5" OD 3.000" ID L: 275'

Drill collars: 8" OD 2.813" ID L: 650

- Hole information

Casing : 13 3/8" OD 12.415" ID L: 3500

Open hole : 12.25" OD

TD : 9000'

Lag Time Calculation

- CALCULATE:

1. Calculate the volume of mud in the Drill pipe, Heavy-weight and collars.
2. Calculate the annular volume for each annular section.
3. Add the section annular volumes to give the total annular volume.
4. Calculate the lag in minutes.

Actual Lag Determination

- Wrap a quantity of fine carbide in paper towel and place it inside the pipe at a connection.



- This acetylene gas is detected by the gas detection equipment when it returns to the surface.
- Since the gas has to travel down the pipe to the bit and then to the surface, it is necessary to calculate the following:
 1. The number of **strokes** from the **surface to the bit** inside the pipe.
 2. The **total** number of **strokes** from starting up the pump until the gas arrives at the surface.
 3. **Subtract 1 from 2**
- If water is not present in the drilling fluid (OBM), carbide can be replaced by rice or lentil.
- Using the **correct** lag is vital to the geologist so that **samples and hydrocarbon** shows are described at the correct **depth** from which they came.

2. Comparing data gathered during drilling with:

a) Predictions made at the exploration stage &

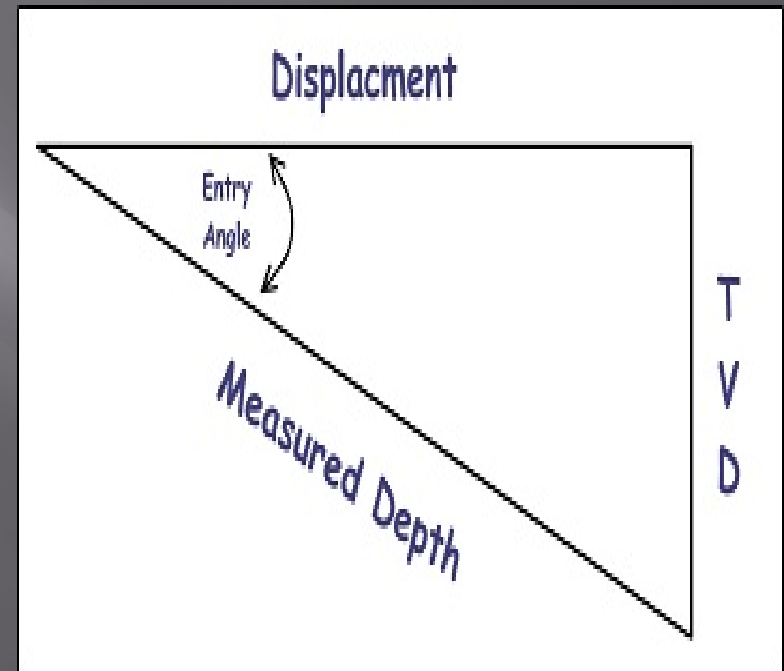
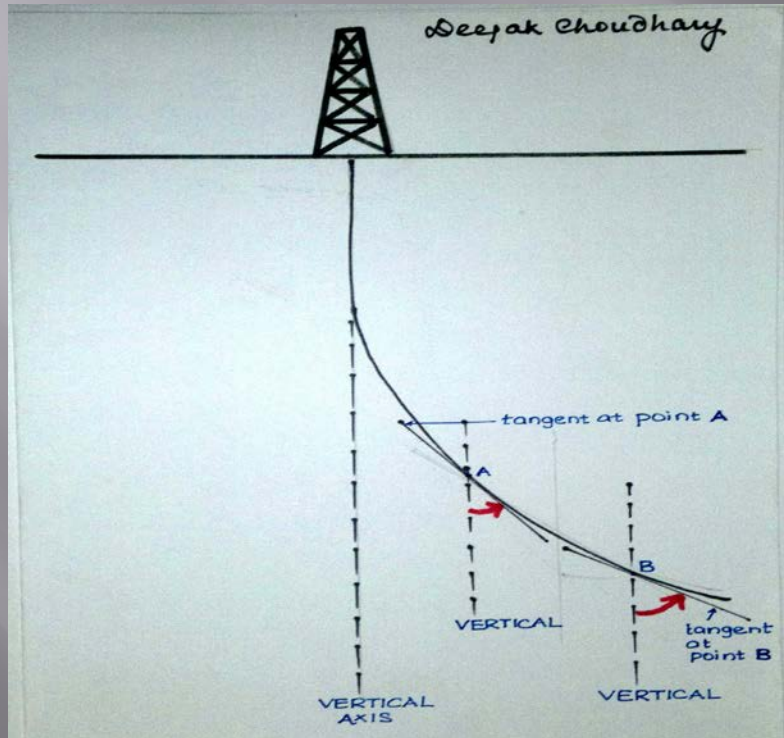
b) The nearest offset well

II- FORMATION TOPS

FORMATION	PROGNOSIS of Well- 3				Offset					
KB=653'	TOPS			Fault	Well- 2			Well- 1		
*Seismic marker	SS	MD	Thick	msng	SS	MD	Thick	SS	MD	Thick
Moghra	180	833	1060		175	825	1059	150	830	1050
Dabaa	1240	1893	971		1234	1884	971	1200	1880	910
Apollonia	2211	2864	544		2205	2855	545	2110	2790	580
Khoman	2755	3408	1445		2750	3400	1444	2690	3370	1455
Abu Roash A	4200	4853	200		4194	4844	201	4145	4825	207
Abu Roash B	4400	5053	677		4395	5045	677	4352	5032	688
Abu Roash C	5077	5730	145		5072	5722	144	5040	5720	143
Abu RoashD	5222	5875	323		5216	5866	323	5183	5863	337
Abu Roash E	5545	6198	95		5539	6189	96	5520	6200	107
Abu Roash F	5640	6293	440		5635	6285	444	5627	6307	399
Abu Roash G	6080	6733	460		6079	6729	456	6026	6706	395
U.Bahariya	6540	7193	193		6535	7185	191	6421	7101	182
L.Bahariya	6733	7386	731		6726	7376	726	6603	7283	780
Kharita	7464	8117	1434		7452	8102	1432	7383	8063	1366
Dahab	8898	9551	52		8884	9534	53	8749	9429	63
Alamein	8950	9603	230		8937	9587	232	8812	9492	245

Formation Top Determination

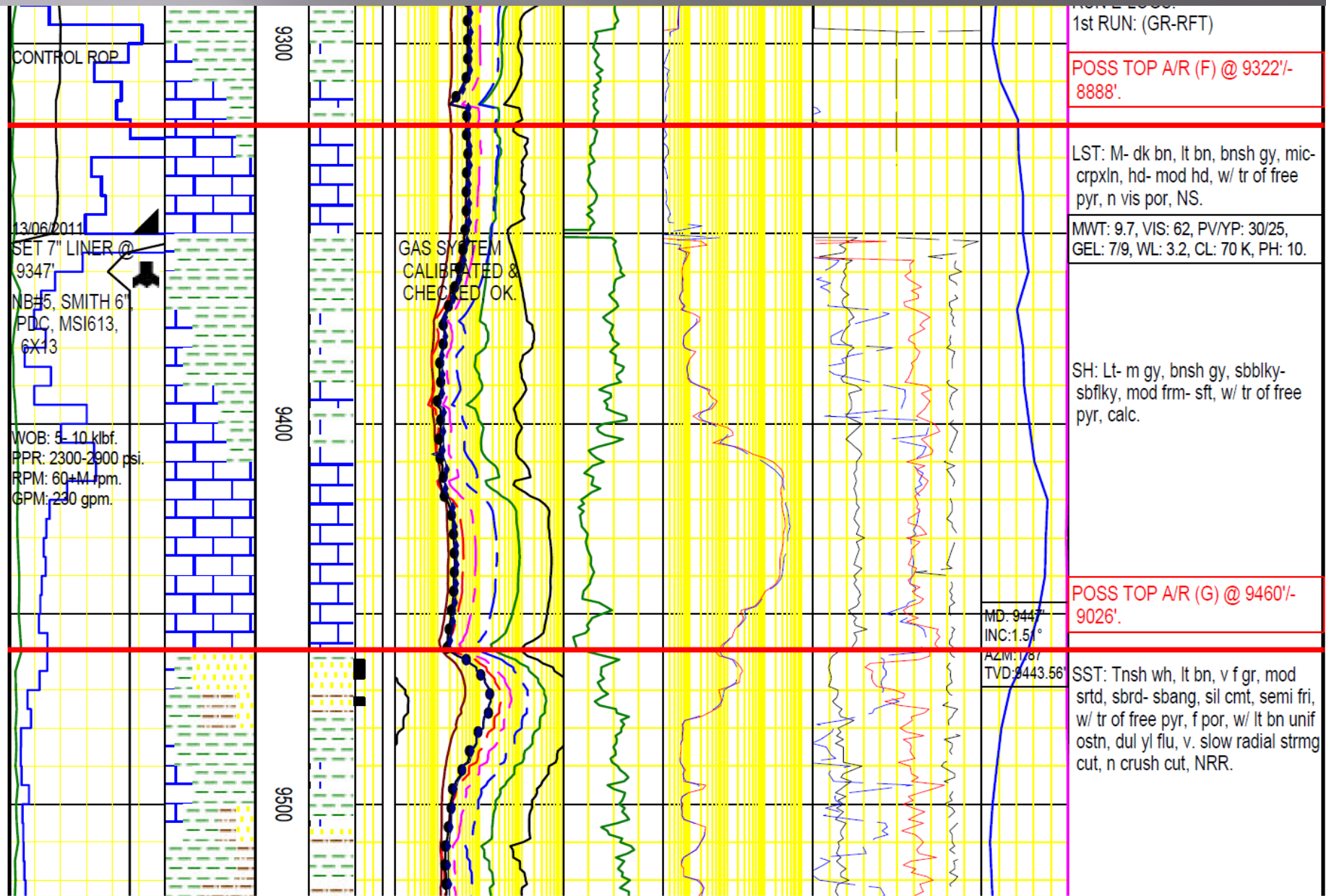
- What is KB-GL & KB- MSL?
- What is the difference between MD, TVD, TVD_{ss}?
- How can you convert MD to TVD in directional drilling well?



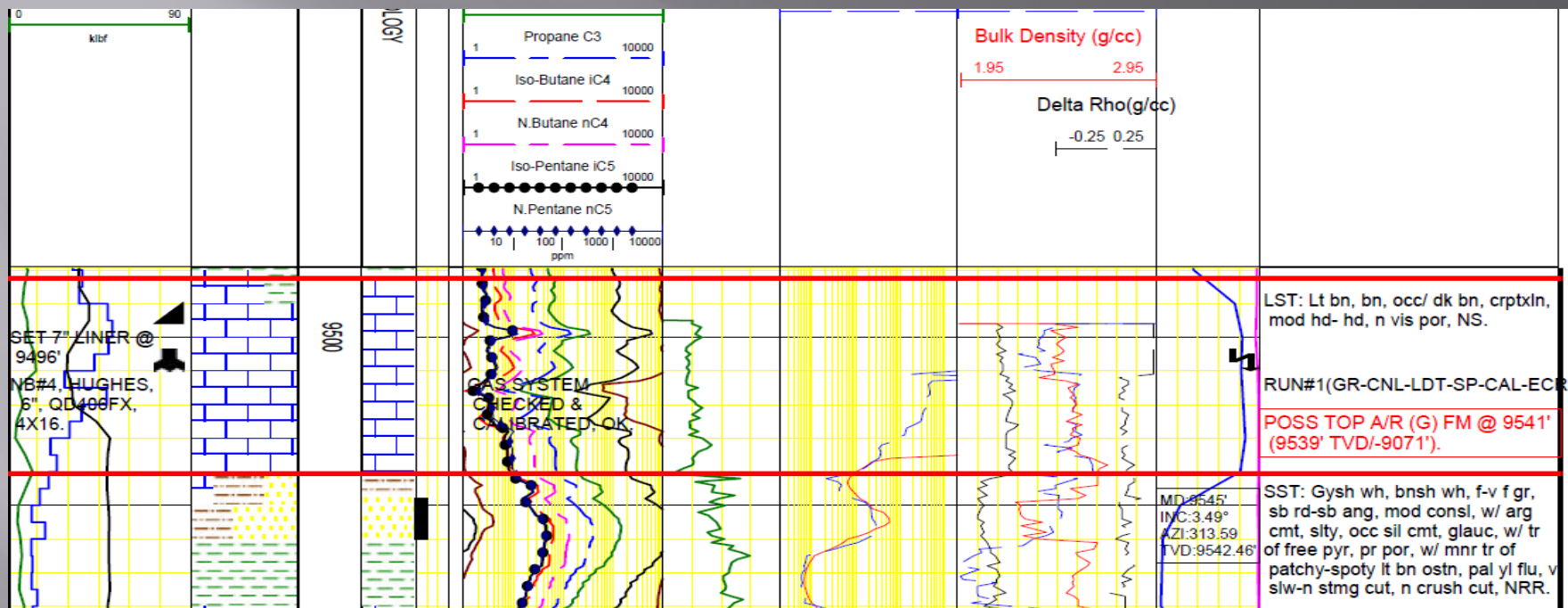
5. Analyzing, evaluating and describing formations while drilling using

- 1. Cuttings 2. gas 3. FELWD (formation evaluation logging while drilling) 4. wireline data.**

1. Cuttings 2. Gas 3. LWD(Logging While Drilling) 4. Wireline data.



Total Gas Percent & Chromatograph Analysis



GAS READING

Formation name	INTERVAL (ft)	TG%	C1 ppm	C2 ppm	C3 ppm	IC4 ppm	NC4 ppm	C5 ppm
KHARITA formation	10399 – 10527	1.28	3656	1292	683	186	275	149
	MAX @ 10493	6.6	20541	6693	2672	594	1074	411

**Supervision of “Formation
Evaluation” contractors
(Mud Logging Geologists,
LWD Logging Engineers,
Wireline Logging & coring
Engineers).**

Mud Logging Unit

Logging unit:

1. The logging unit is kept clean, neat أنيق and tidy at all times.
2. Ensure that all equipment and sensors are maintained, serviced and calibrated
3. Ensure that the unit diary دفتر, spare parts inventory, equipment status reports, calibration reports and other specified equipment monitoring reports are kept up to date.
4. Familiar with the function, operation and routine maintenance of all logging system equipment at the location.
5. Familiar with the hardware configuration of the computer system and is capable of operating the software.

Mud Logging Unit

Well Monitoring:

1. Ensure that the unit is manned at all times and the well is constantly monitored.
2. All pertinent data is recorded on data sheets accurately.
3. All sensors are monitored for variations from expected readings.
4. All hole and pipe displacements are accurately monitored on all trips in and out of the hole.

Mud Logging Unit

Data Collection and Presentation:

1. Depth, drilling data and log data must be recorded accurately and checked against rig recorded data.
2. Gas and mud samples for gas analysis should be collected in the correct manner
3. All cuttings samples must be caught at the correct time to give a true representation of the interval.
4. All samples will be marked and labeled as per customer requirements.

Mud Logging Unit

Safety

- ❑ Safety is the responsibility of every employee. The safety rules and guidelines issued by the company must be fully understood and followed.



Mud Logging Unit

Training

1. You will attend training courses as directed, and will train for promotion to higher grades within the company.
2. Assist in the training of the new employees in the fundamentals of logging techniques, job requirements and maintenance of the equipment.
3. Submit to the relevant supervisor, written appraisal reports on trainees for each training period.



Wire line Quality Control

- ▣ A good evaluation is only possible with good quality log data

The following should be considered

1. Preparation for the logging
2. Pre logging
3. While Logging
4. Post Logging

Wire line Quality Control

1. Preparation for the logging

First of all, the witness should be fully aware of the logging program and all required data. The witness should do the following:

- Call the wire line contractor early enough to allow time to travel to the rig site and time to check the operation of logging equipment once on location.
- A copy from the mud log should be ready to be during the logging operation.
- It is recommended to take the mud sample from the flow line 15 minutes before the end of last circulation for accurate resistivity measurements.
- Discuss the hole condition with the drilling supervisor covering points such as tight spots, dog-legs, lost circulation material, and stuck pipe lubrication.

Wire line Quality Control

2. Pre logging :

- Give the logging engineer the well information (as per the wireline contractor well data sheet).
- Discuss the logging program, log presentation, scales, digital data format requirements, etc., with the logging engineer
- Verify that both primary and backup tools are checked prior to the start of the logging job.
- Check that the master calibrations match the tool numbers and are current (generally less than 1 month old).
- Check with the logging engineer on tolerance limits of calibrations and tool surface checks, especially the new generation tools.
- Check on the tool combinations before run in hole, total length, number of standoff and centralizers (if any) and their positions.
- Check on a minimum of two thermometers on every trip in the hole and ensure that the logging crew checks them.

Wire line Quality Control

3.While Logging

- Check the calculation of the cable stretch for accurate depth measurements. Also the determination of the cable strength rating and weak point rating and record them.
- Check the acoustic and caliber readings inside the casing ($DT\ STEEL = 57\ \mu sec$ in free pipe, caliber = casing ID).
- In case of bad hole condition ask the logging engineer to log while run in hole (of course without opened calipers) and start the main log directly after reaching TD then make the repeat section through any good hole section.
- Logging speed should be adjusted to the “slowest” device in the tool combination. Thin-bed analysis may require slower logging speeds for better statistical response with nuclear tools.
- Run a minimum of 200 feet of repeat log covering zones of interest and zones that exhibit an abnormal log response.
- Check the repeatability. Factors that contribute to poor repeats include washed-out holes, variable tool centering (especially in large holes with conductive muds), pad devices following different borehole paths, statistical variations in radioactive chemical source emissions, and tool malfunction.

Wire line Quality Control

3.While Logging

- Check against offset logs for similar log responses in similar lithologies.
- Check that all curves recorded on the same trip in the hole are on depth with each other.
- Make sure that there is a minimum of 100 feet of gamma ray overlap with previous run.
- Be alert for indications of deteriorating hole conditions (e.g. increasing cable tension and caliper activity). If necessary, pull out of the hole (after discussions with supervisors) and make a condition trip.
- In case of running super combination tools, if any of the tools failed on bottom (except resistivity), keep logging the rest of tools then go back and log the failed one.
- Centralized acoustic, resistivity, and dielectric tools should repeat exactly.
- Check that the in times print out log is correct and ready for faxing at any time to main office.
- Always remember to fill in the time break down sheet for every tool run in the hole.

Wire line Quality Control

4. Post Logging

- Fill in a section on the log quality control and performance sheet after every tool run in the hole.
- Ensure that successive logging runs are on depth with each other.
- Check that all items on the log header are accurately filled out, especially Remarks on any log anomalies.
- Check the calibration tails (before, after, and shop), and ensure that they are attached to the log films and the calibration numbers are within tolerance.
- Check that the digit tape labels are completely and correctly filled out.
- Discuss the logs thoroughly with the wireline engineer and ask for an explanation of any abnormal curve responses, equipment failures, or hole problems.
- Make sure that any of these comments have been entered under Remarks on the log header and on the log quality control sheet.
- Make sure to complete both the time break down and quality control and performance sheets.

Wire line Quality Control:

OPERATION	1 st RUN
RIG UP	16:30 (02/04/2011)
RIH W/ TOOL	18:00
TOOL ON BTM	20:30
START R/S	20:00
END R/S	20:15
START MAIN LOG	20:30
END MAIN LOG	01:30 (03/04/2011)
TOOL ON SURFACE	1:50
RIG DOWN TOOL	2:50