WELL COMPLETION REPORT

WEST WHIPTAIL-1

VOLUME 1
BASIC DATA

GIPPSLAND BASIN
VICTORIA

ESSO AUSTRALIA PTY LTD

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November 2004

WELL COMPLETION RPEORT
WEST WHIPTAIL-1

VOLUME 1:

BASIC DATA

WELL COMPLETION RPEORT
WEST WHIPTAIL-1

VOLUME 1:

BASIC DATA (cont'd)

ENCLOSURES

1. **MASTER LOG 1:500 scale**
2. **MASTER LOG 1:200 scale**
3. **DRILLING LOG**
4. **GAS RATIO LOG**
5. **RESERVAL RATIO LOG**

I. WELL DATA RECORD

LOCATION	:	Latitude : 38° 19' 29.150" S Longitude : 147° 30' 17.167" E X= 544,121.32 East Y= 5,758,030.22 North Map Projection: UTM Zone 55 / AMG Zone 55 Central Meridian 147° East Geographical Location: Victoria,Australia.
FIELD :		Gippsland Basin, Victoria
PERMIT	:	Gippsland Basin, Vic / L1
ELEVATION	:	-78.2m MD
WATER DEPTH	:	39.0m MD
TOTAL DEPTH	:	1539.0m MD(Driller)1535m MD(Logger)
REASONS FOR PLUGGING BACK	:	Plugged and abandoned
MOVE IN	:	8th May 2004
SPUDDED	:	10th May 2004
REACHED TD	:	20th May 2004
RIG RELEASED	:	5th June 2004
OPERATOR	:	Esso Australia Resources Pty Ltd.
PERMITTEE OR LICENCEE	:	BHP Billiton Petroleum (Bass Strait) Pty Ltd and Esso Australia Resources Pty Ltd
ESSO INTEREST	:	50 %
OTHER INTEREST	:	BHPB 50%
CONTRACTOR	:	Ensco Australia Pty Ltd.
RIG NAME	:	Ensco 102
EQUIPMENT TYPE	:	Jack-up
TOTAL RIG DAYS	:	29
DRILLING AFE NO	:	L0501D001
TYPE COMPLETION	:	Plugged and Abandoned
WELL CLASSIFICATION	:	Wildcat

II. OPERATIONS SUMMARY

1. MOVING

At 0030 hrs on the 8th of May 2004 the Ensco 102 arrived to within one nautical mile of the West Whiptail 1 location. The rig was pinned in 39 meter water on location and preloading was completed. Final leg penetration was starboard leg 1.7 ft, bow leg 1.9 ft, and port leg 1.7 ft. The cantilever was skidded out and the rig was prepared for drilling.

2. DRILLING OPERATIONS

36" Hole.

The 36" hole section was drilled from surface to 123m MDRT.

The 36" hole was drilled riserless using a 17 1/2" Security EBXT1G bit (bit run 1) with a 36" hole-opener. The sea floor was tagged (firm) at 78.6 m MDRT, West Whiptail-1 was spudded at 23:00 hrs on May 10th 2004. The 36" hole section was drilled with seawater and 40bbls hi-vis pre-hydrated gel (PHG) sweeps, pumped every 15m. At section TD (123m MD) the hole was swept clean with 50 bbl hi-vis pill and displaced with a 200 bbls of high vis mud. An Anderdrift survey was run at TD (0 degrees).

30" Casing

Ran 30", 310 ppf, X52, ST-2 casing to 34 m. Pressured up on the 30 inch with 200 psi with seawater and opened the float shoe. Released ST 2 snap ring and stood back landing tool.

Continued running 30 inch conductor from 34 meters to 45 meters. Due to heavy seas and 35 knot wind, conductor hammered pollution control unit and swung considerably. Decision was made to wait on weather.

Picked up DP while waiting on weather.

Continue to run 30" conductor to 102 meters. Laid down the 30" running equipment and picked up drill pipe elevator and the conductor landing assembly on drill pipe. Ran the conductor in hole to the final shoe depth of 120.4 m and cemented with 1084 sacks of Class G cement.

Landed Cameron Fastlock connector on wellhead and skidded BOP stack and land on wellhead connector. Picked up BOP's and installed on Fast Lock connector. Nippled up BOP's and diverter.

12 1/4" Hole

The 12 1/4" hole was drilled from 123m to 750m MDRT.

Drilled 12-1/4" hole from 123m to 750m taking Anderdrift surveys. Circulated 3 times bottom up while rotating & reciprocating pipe. Displace hole with 400 bbls of Hi-Vis 8.7 ppg mud. Dropped SDI "Keeper" Gyro Survey and pumped 25 bbl slug. Pulled out of hole and laid down 12-1/4" BHA. Recovered Gyro.

9 5/8" Casing

Rigged up and ran 9 5/8", 47 ppf, L80, LTC casing to 727 m. Shoe track consists of self filling float shoe, full joint, self filling float collar with bypass baffle on top, full joint, and shut off baffle adapter. Installed 9 5/8" x 17" rigid centralizer mid joint below HES cementer. Made up HES cementer stage tool in casing string. Picked up & made up Cameron 18-3/4" x 9-5/8" casing hanger & running tool assembly. Made up landing string & landed out casing hanger with 9-5/8" shoe at 745m.

Picked up & installed cement head. Rigged up lines displace and circulated hole with seawater. Lined up cement unit to cement head, tested lines to 3000 psi and pumped 40 bbls of seawater. Mixed and pumped cement job as follows: Lead: 163 bbl, (416 sx/915 cu ft) Class "G" cement, Tail: 68 bbl, (332 sx/382 cu ft) Class "G" cement. Cement unit displaced with 20 bbl seawater followed by rig pumping 152.3 bbl for total displacement of 172.3 bbl to bump plug.

Pressured up to 2150 psi to open the Halliburton ES Stage Cement collar at 88m. Pumped 330 bbl 13.5 ppg mud, circulating seawater out. Pumped 330 bbl of sugar water. Made up and locked in seal assembly and casing hanger. Rigged up and performed BOP tests.

8 1/2" Hole was drilled from 750m to 1539m MD.

Picked up and made up 8½" BHA while running in hole. Drilled out stage collar and continued to run in hole to tag cement at 720 m. Pressure tested and drilled cement to 740 m. Performed choke drill and pressure tested top drive IBOP valves. Drilled out cement and shoe track from 740 m to 745 m and cleaned out rat hole to 750 m. Drilled 3 m of new formation to 753 m. Performed leak off test with 9.7ppg mud to 590psi EMW of 14.3ppg. Drilled 8½" hole from 753 m to 1539 m. Circulated bottoms up and pulled out of hole to shoe. Ran back in hole and circulated hole clean. Pulled out of hole, laid out 8½" BHA.

Rigged up Schlumberger wireline. Ran in hole with Run #1: PEX-HALS-HNGS-DSI. Logged repeat section from 1480 m to 1380 m. Ran in hole and tagged at 1529 m. Logged main log from 1529 m to 745 m. Continued logging through casing from 745 m to surface. Removed radioactive source and laid out tools. Made up Run #2: MDT-GR and run in hole. Tools hung up at 1241 m. Pulled out of hole and laid out tools. Rigged down Schlumberger.

Made up BHA and ran wiper trip to TD. Circulated and conditioned hole. Pulled out of hole with tight spot at 1267 m. Reamed through and circulated clean. Pull out of hole and racked back BHA.

Cleared floor and rigged up Schlumberger. Made up Run #2A: MDT-GR and ran in hole to 1345 m. Logged from 1345 m to 1475 m. Pull out of hole and laid out tools. Made up Run #3: CSAT-GR and ran in hole. Hung up at

1271 m. Logged up to 100 m; surveying every 50 m. Pulled out of hole and lay out tools. Run #4: CST-GR abandoned due to poor hole conditions. Rigged down wire line and cleared floor.

Picked up and ran 2 7/8" tubing and mule shoe and ran cement abandonment plugs:

Plug 1a: 1365.0 - 1539.0
Plug 1b: 1191.0 - 1365.0
Plug 1c: 1017.0 - 1191.0
Plug 1d: 843.0 - 1017.0
Plug 1e: 669.0 - 843.0
Plug 2: 110.0 - 170.0

Nippled down BOPs and lines, while laying out DP. Attempted to lift BOPs. Hoist gearbox failure stopped operations. Lay down BOPs. Lay out 5" DP. Make up 95/8" mill / jetting tool assembly and jetted seal assembly. Retrieved 9 5/8" seal assembly. Made up and ran 9 5/8" casing cutter. Made casing cut at 87 m. Pulled and laid out 9 5/8" casing. Made up and ran in hole with hanger running tool. Attempted to engage hanger. Pulled out of hole and made up 9 5/8" mill / jetting assembly. Carried out rig maintenance while waiting on parts. Repaired hoist. Removed BOP. Cut 30" casing and laid down 30" conductor. Backloaded equipment, cantilevered in, jacked down and prepared for rig move. Towed rig to 1 NM off Yolla location and released rig.

Suite 1 of wire line log run

RUN #1 PEX-HALS-DSI-HNGS-LEHQT
RUN #2 MDT-GR-LEHQT
RUN #2A MDT-GR-LEHQT (pressures and samples)
RUN #3 CSAT-GR

III. CASING DATA

Type	Size (inches)	Weight (ppf)	Grade	Thread	Depth (mMDRT)
Conductor	30	310	X-52	RL-4	120
Surface Casing	9.625	47	L-80	LTC	745

IV. CEMENTING DATA

String Cemented	Cement Type	Dry Cmt Vol (sx)	Cement Additives	Mix Water (bbls)	Slurry Vol (bbls)	Slurry Density (ppg)	Cement to/from (mMDRT)	Csg Test Pressure (psi)
30” X 20" X 13.375”	Class G	1084	1% CaCl 0.3 gal/bbl NF-6	130	220	15.9	121 – Seafoor	1408 psi
9.625" Lead	Class G	415	Econolite 14.6 gal/10 bbl Econolite	130	164	12.5	89	1900
9.625" Tail	Class G	323	Neat Seawater	40	68	15.8	745	

IV. CEMENTING DATA

ABANDONMENT PLUGS

	Cement Type	Dry Cmt Vol (sx)	Cement Additives	Mix Water	Slurry Vol (bbls)	Slurry Density (ppg)	Cement to/from (mMDRT)	Csg Test Pressure (psi)
Plug #1a	Class G	197	3 gal/10 bbl HR6L + 20 GAL/10B BL HAL 413	24	40.7	15.8	1365 – 1539	Balanced plug
Plug #1b	Class G	208	3 gal/10 bbl HR6L + 20 GAL/10B BL HAL 413	25	43	15.8	1191 – 1365	Balanced plug
Plug #1c	Class G	252	3 gal/10 bbl HR6L + 20 GAL/10B BL HAL 413	31	52.15	15.8	1017 – 1191	Balanced plug
Plug #1d	Class G	222	3 gal/10 bbl HR6L + 20 GAL/10B BL HAL 413	27	45.86	15.8	843 – 1017	Balanced plug
Plug #1e	Class G	222	1% CaCl	25	42.6	15.9	669 – 843	Tag cmt 675m
Plug #2	Class G	70	1% CaCl	8.5	14.6	15.9	110 - 170	

V. SAMPLES, SIDEWALL CORES

Cuttings Samples

Interval (m)	Type	Sets
150-1040	Washed and dried samples every 30m	4
1040 – 1539	Washed and dried samples every 5m	4

Conventional Cores

No conventional cores were cut at West Whiptail –1.

Sidewall Cores

No sidewall cores were cut at West Whiptail –1.

VI. WIRELINE LOGS AND SURVEYS

Survey /Log	Company	Top (m MDRT)	Bottom (mMDRT)
Suite 1 Run at 1526.7m			
Directional Survey	Anderdrift	93.0	1445.0
Gyro Survey	Scientific Drilling	104.0	1521.9
PEX-HALS-DSI-HNGS-LEHQT	Schlumberger	77.6 GR to Sea Floor	1526.0
MDT-GR-LEHQT (wiper trip)	Schlumberger	Run aborted 1241	Run aborted 1241
MDT-GR-LEHQT (pressures and samples)	Schlumberger	1364.0	1470.0
CSAT-GR	Schlumberger	100.0	1264.0

VII. SUMMARY OF FORMATION TEST PROGRAMME

SUITE	TYPE OF LOG	FROM	TO	RPT. SECT. / SUMMARY.	Time Since Last Circ / BHT
1	MDT-GR-LEHQT	1470.0	1364.0	20 stations measured	42.30 hrs/69ºC @ 1470m

VIII. TEMPERATURE RECORD

SUITE 1

LABEL	TYPE OF LOG	FROM	TO	RPT. SECT. / SUMMARY.	Time Since Last Circ / BHT
1	PEX-HALS-DSI-HNGS-LEHQT	1529.0	77.6	1480 - 1380	10.40 hrs/72ºC
2	MDT-GR-LEHQT	1241.0	1241.0	Could not pass due to bridging of hole	N/a
3	MDT-GR-LEHQT (pressures and samples)	1470.0	1364.0	20 stations	42.30 hrs/69ºC @ 1470m
4	CSAT-GR	1264.0	100	N/a	N/a

GIPPSLAND BASIN LOCATION MAP

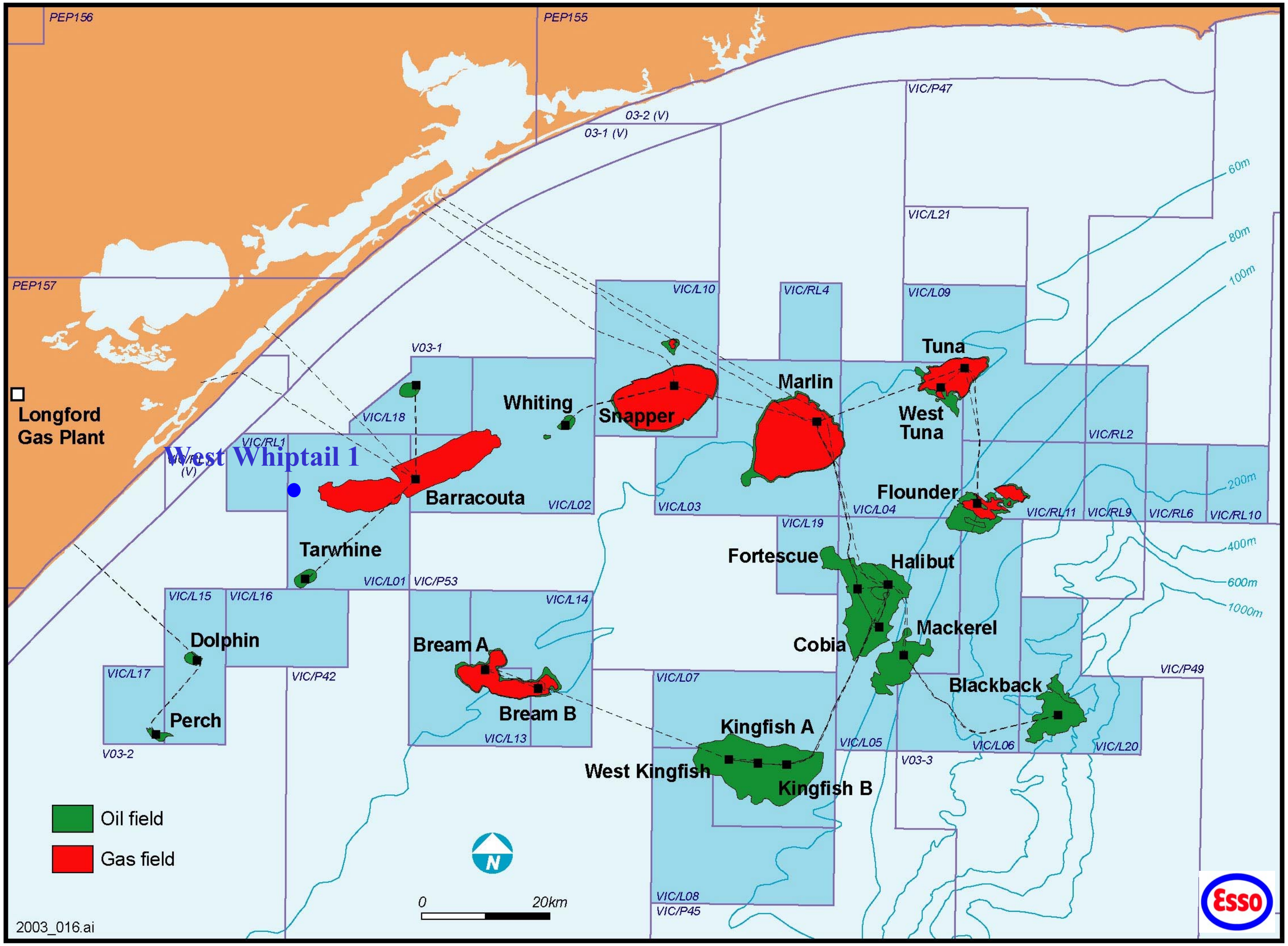
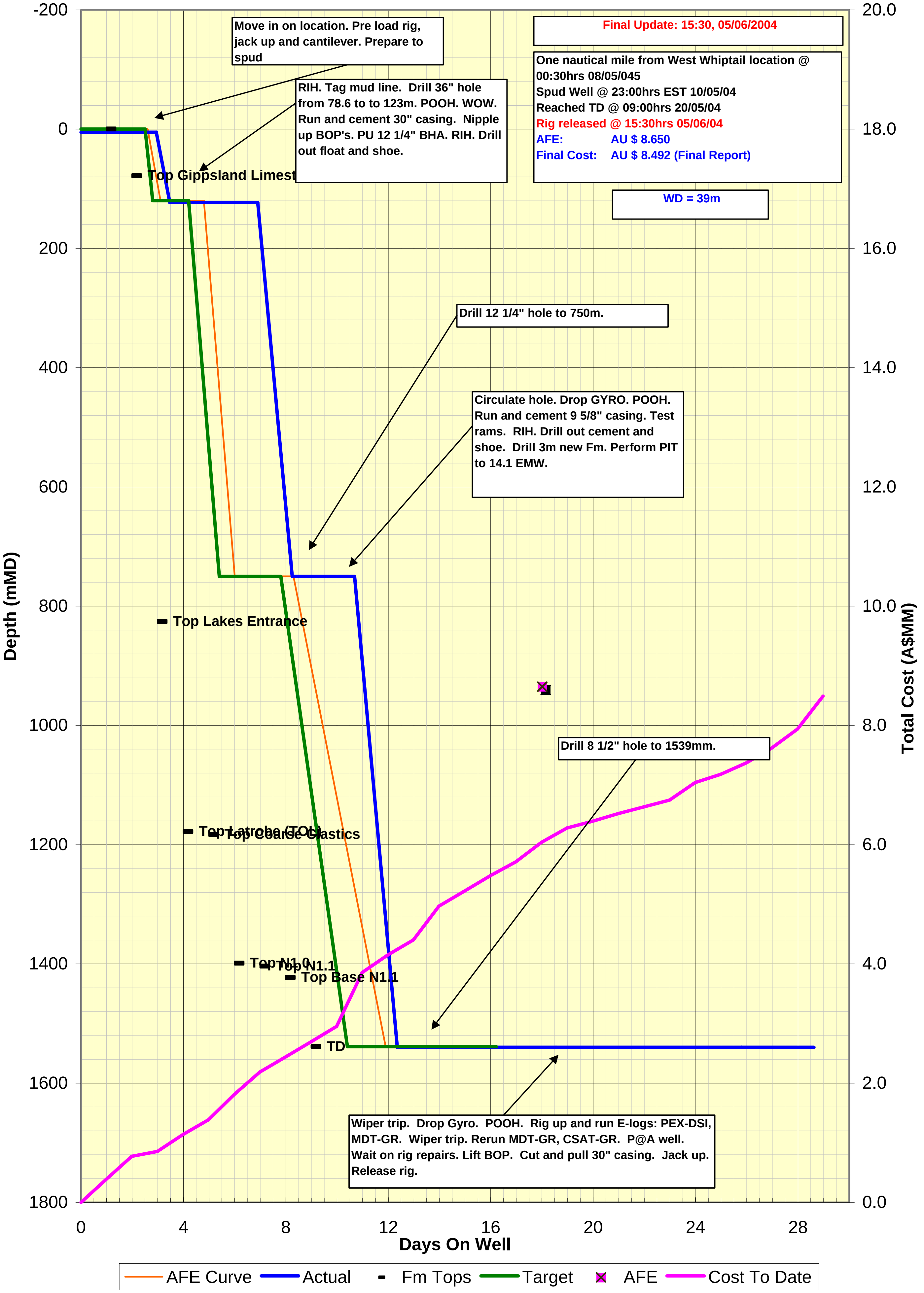


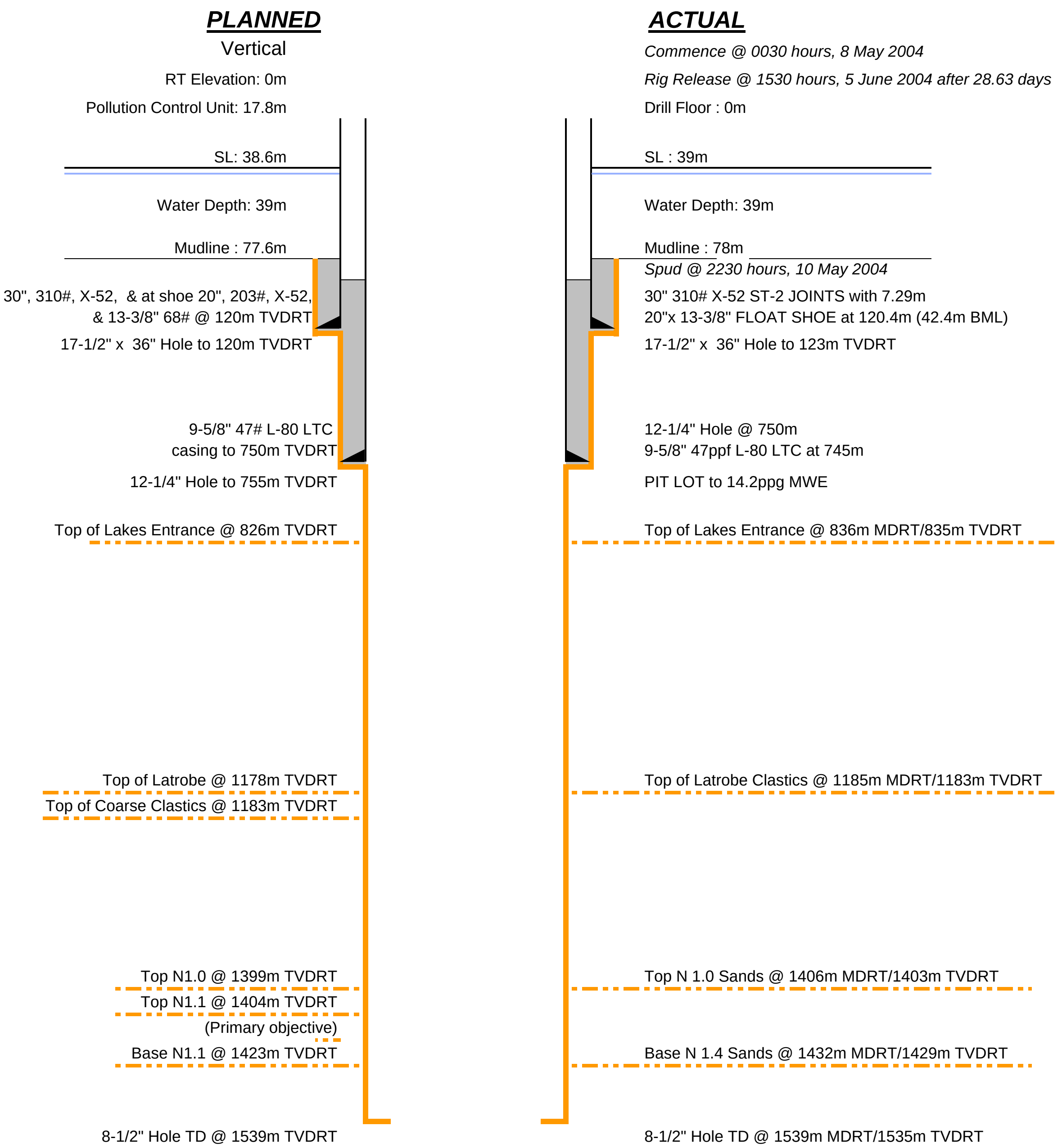
FIGURE 1

West Whiptail-1 Time vs Depth Curve



EAL Ops Geology (AJH): 8/06/04

WEST WHIPTAIL-1 WELLBORE SKETCH

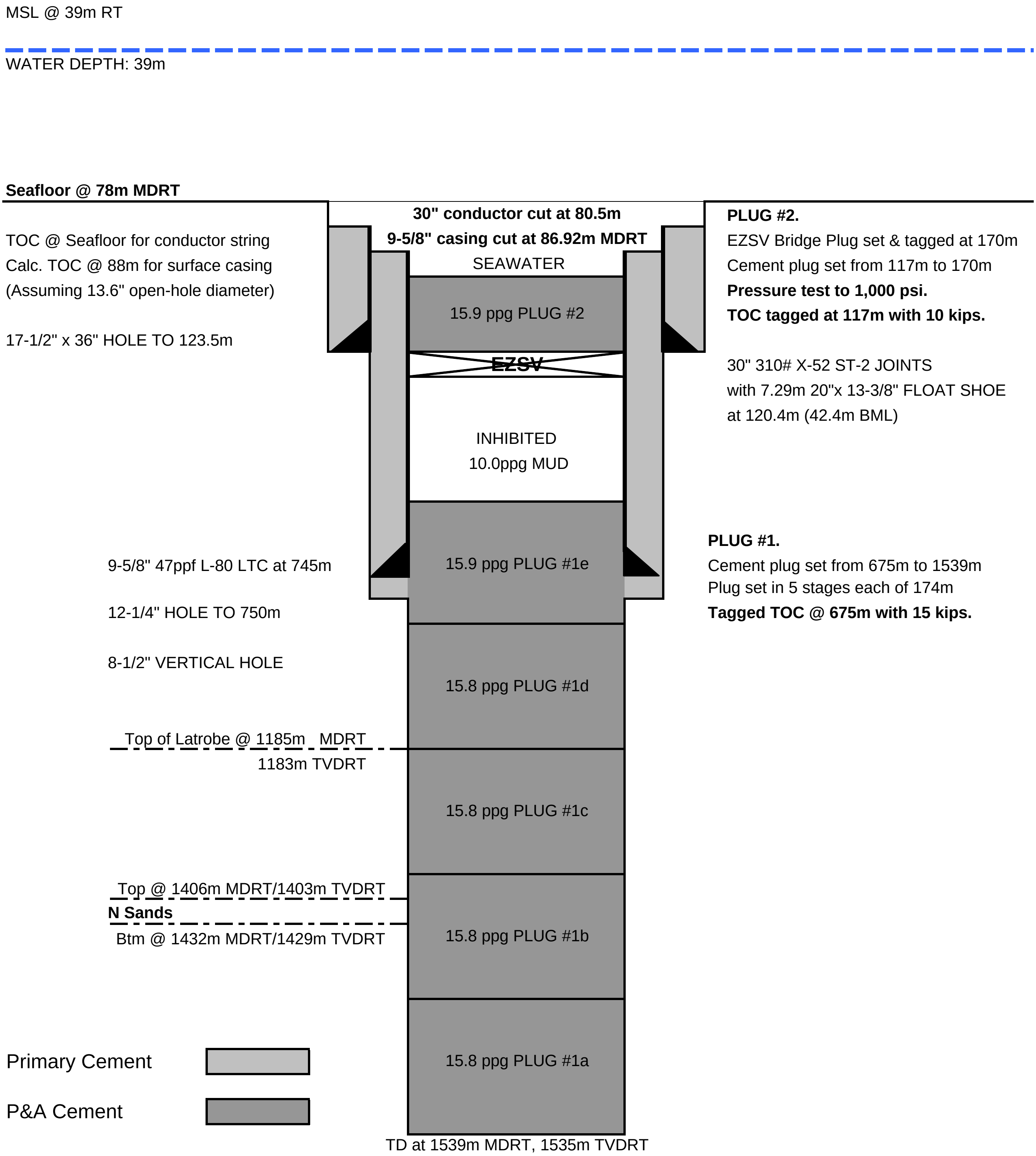


ACTUAL PLUG AND ABANDONMENT WELLBORE SKETCH
WEST WHIPTAIL-1
Drilled by the Jack-up ENSCO 102

LOCATION: GDA94. Latitude 38° 19' 29.150" S. Longitude 147° 30' 17.167" E.
MGA Zone 55 Easting 544,121.32m, Northing 5,758,030.22m

Rig on Location 0300 hours 8 May 2004. Rig released 1530 hours 5 June 2004.

ALL DEPTHS ARE METRES FROM ROTARY TABLE. FORMATION TOPS FROM PRELIMINARY GEOLOGCAL REPORT.



07/07/2004

APPENDIX 1

LITHOLOGICAL DESCRIPTIONS

West Whiptail-1 Lithology/Show Descriptions

Interval (m)		Lithology / Show Description	
From	To	%	
			From mudline to 120m, well drilled without riser, all returns to the seafloor. All depths are MDRT unless otherwise specified.
120	150	100	CALCARENITE TO CALCRUDITE: very light grey to light grey, occasional medium grey to dark yellowish orange grains, very soft to loose, abundant fossil and shell fragments including gastropods, pelecypods, forams, bryazoans, echinoids, trace mica.
150	180	100	CALCARENITE TO RARE CALCRUDITE: very light grey to light grey, occasional medium grey to dark yellowish orange grains, very soft to loose, abundant fossil and shell fragments including gastropods, pelecypods, forams, bryazoans, echinoids, trace quartz grains.
180	210	100	CALCARENITE: very light grey to predominantly light grey, loose - friable aggregates, abundant fossil fragments, predominantly bryazoans also gastropods, pelecypods, forams, and echinoids.
210	240	100	CALCARENITE: as above
240	270	100	CALCARENITE: as above
270	300	100	CALCARENITE: very light grey to predominantly light grey, occasional medium to dark grey grains, loose - friable aggregates, abundant fossil fragments, predominantly bryazoans also gastropods, pelecypods, forams, and echinoids.
300	330	100	CALCARENITE: as above
330	360	100	CALCARENITE: as above
360	390	80	SANDSTONE: clear to translucent, medium dark yellowish / orange stained grains, loose and unconsolidated, medium to coarse occasionally very coarse grains, poorly sorted, rounded to well rounded, hi-sphericity in part, clean, very good inferred porosity.
		20	CALCARENITE: as above
390	420	95	SANDSTONE: clear to translucent, medium dark yellowish / orange stained grains, loose and unconsolidated, fine to very coarse grains, poorly sorted, rounded to well rounded, hi-sphericity in part, clean, very good inferred porosity.
		5	CALCARENITE: as above
420	450	90	SANDSTONE: as above
		10	CALCARENITE: very light grey to white, rare medium to dark grey grains, loose - friable aggregates, abundant fossil fragments, predominantly bryazoans also forams and echinoids.
450	480	90	CALCARENITE: off white to light grey, very fine to coarse grained, poor to moderate sorting, subangular to subrounded where fine grained, moderate to weak calcareous cement & matrix, common macrofossil fragments, trace glauconite, common limestone fragments, friable to moderately hard where cemented, tight to nil visual porosity, trace, dull, solid, yellow mineral fluorescence (no cut) associated with limestone fragments.
		10	SANDSTONE: as per 390 - 420 mRT.

West Whiptail-1 Lithology/Show Descriptions

Interval (m)		Lithology / Show Description	
From	To	%	
480	510	100	CALCARENITE grading to CALCAREOUS SANDSTONE: off white to pale grey/brown, generally fine to occasionally coarse grained, poor to moderate sorting, subangular to subrounded where fine grained, moderate to weak calcareous cement & matrix, common macrofossil fragments, trace glauconite, common limestone fragments, friable to moderately hard where cemented, poor to tight visual porosity, good inferred porosity associated with mud losses. Trace, dull, solid, yellow mineral fluorescence (no cut) associated with limestone fragments.
510	540	70	CALCAREOUS SANDSTONE: off white to translucent, very fine to coarse grained, generally fine to medium grained, poor sorting, subangular to subrounded, weak to moderate calcareous cement, common macrofossil fragments, trace limestone fragments, friable to moderately hard where cemented, poor to tight visual porosity in aggregates, fair inferred porosity associated with mud losses. 5% dull, solid, yellow mineral fluorescence (no cut).
		30	CALCARENITE grading to CALCAREOUS SANDSTONE: as above.
540	570	70	CALCAREOUS SANDSTONE: as above.
		30	CALCARENITE grading to CALCAREOUS SANDSTONE: as per 480 - 510mRT.
570	600	90	CALCARENITE grading to CALCAREOUS SANDSTONE: off white to pale grey/brown, very fine to coarse grained, predominantly fine grained, poor sorting, subangular to subrounded, abundant calcareous cement & matrix, scattered macrofossil fragments, common limestone fragments, friable to moderately hard where cemented, poor to nil visual porosity. 5%, dull, solid, yellow, mineral fluorescence (no cut) associated with carbonate fragments.
		10	CALCAREOUS SANDSTONE: as per 510-540mRT.
600	630	100	CALCARENITE: as above.
630	660	90	CALCARENITE: off white to pale grey/brown, very fine to fine grained, moderately well sorted¸ subrounded, abundant calcareous cement & matrix, trace macrofossil fragments, trace glauconite, moderately hard, tight to nil visual porosity. 5%, dull, solid, yellow, mineral fluorescence.
		10	CALCSILTITE: pale grey, mottled white, argillaceous, scattered white lithic fragments, subblocky, moderately hard.
660	690	90	CALCARENITE: off white to pale grey/brown, very fine to fine grained, moderately well sorted¸ subrounded, abundant calcareous cement & matrix, trace macrofossil fragments, trace glauconite, firm - moderately hard, tight to nil visual porosity. 5%, dull, solid, yellow, mineral fluorescence.
		10	CALCSILTITE: pale grey - medium light grey, mottled white, argillaceous, scattered white lithic fragments, subblocky, firm - moderately hard.
690	720	90	CALCARENITE: off white to pale grey/brown, very fine to fine grained, moderately well sorted¸ subrounded, abundant calcareous cement & matrix, trace macrofossil fragments, trace micro fossils, trace glauconite, firm - moderately hard, trace dull, solid, yellow, mineral fluorescence.
		10	CALCSILTITE: pale brownish grey - medium light grey, mottled white / pale brown, argillaceous, scattered white lithic fragments, subblocky, firm - moderately hard.
720	750	80	CALCARENITE: off white, pale grey / brown, very fine to fine, moderately well sorted, sub rounded, abundant calcareous cement and matrix, trace glauconite, trace micro and macro fossils, firm, trace dull yellow mineral fluorescence.

West Whiptail-1 Lithology/Show Descriptions

Interval (m)		Lithology / Show Description	
From	To	%	
		20	CALCSILTITE: light brownish grey, off white / light grey, sub blocky, common calcareous fragments, grading to very fine calcarenite, very soft to firm.
750	780	50	CALCSILTITE: pale grey to off white, argillaceous & grading to marl in part, commonly arenaceous & grading to off white very fine grained calcarenite, firm to moderately hard, subblocky.
		50	MARL: light grey, firm to moderately hard, subblocky.
780	810	50	CALCSILTITE: as above.
		50	MARL: as above.
780	840	70	CALCSILTITE: as per 750-780mRT.
		30	MARL: as per 750-780mRT.
840	870	70	CALCSILTITE: pale grey to off white, argillaceous & grading to marl in part, firm to moderately hard, subblocky.
		30	MARL: pale grey, soft - firm, subblocky, rare disseminated pyrite.
870	900	70	CALCSILTITE: as above
		30	MARL: as above
900	930	100	CALCLUTITE: medium grey, firm - friable, sub blocky - blocky, argillaceous, silty in part, trace disseminated pyrite, trace glauconite
930	960	100	CALCLUTITE: as above
960	990	100	ARGILLACEOUS CALCILUTITE: light to medium grey, soft to firm, subblocky - blocky, very argillaceous, silty in part and gradational to calcsiltite, trace forams, trace glauconite, trace disseminated pyrite.
990	1020	50	ARGILLACEOUS CALCILUTITE: as above
		50	MARL: light to medium grey, very soft - soft, rare sub firm, sub blocky, silty in part, trace forams, trace disseminated pyrite.
1020	1040	100	MARL: as above
1040	1045	100	MARL: light to medium grey, very pale greenish grey, very soft - soft, rare sub firm, sub blocky, silty in part, trace forams, trace nodular glauconite.
1045	1050	100	MARL: as above
1050	1060	100	MARL: as above
1060	1070	100	MARL: as above
1070	1080	100	MARL: light to medium grey, very pale greenish grey, occasionally brownish grey, soft - rarely firm, sub blocky to blocky, rare silty, trace forams, rare pyrite, trace glauconite.
1080	1090	100	MARL: as above
1090	1100	100	MARL: as above
1100	1110	100	MARL: light brownish grey, pale greenish grey, off white, very soft - soft, sub blocky, trace disseminated pyrite, trace fine glauconite, trace forams.
1110	1120	90	MARL: as above
		10	SILTSTONE: brownish grey, very soft - soft, argillaceous, slightly to moderately calcareous, trace carbonaceous specks.
1120	1130	90	MARL: as above
		10	SILTSTONE: as above
1130	1150	100	SILTSTONE: brownish grey, very soft -soft, argillaceous, calcareous to very calcareous, rare very fine disseminated pyrite, very glauconitic in part.
1150	1160	100	SILTSTONE: as above
1160	1170	100	SILTSTONE: brownish grey to dark brownish grey, very soft to soft, sub blocky, argillaceous, very calcareous, very glauconitic (disseminated and nodular) in part.

West Whiptail-1 Lithology/Show Descriptions

Interval (m)		Lithology / Show Description	
From	To	%	
1170	1175	100	SILTSTONE: brownish grey to dark brownish grey, very soft to soft, sub blocky, argillaceous, very calcareous, occasionally pyritic and hard, very glauconitic (disseminated and nodular) in part.
1175	1180	100	SILTSTONE: brownish grey to dark brownish grey, olive grey, very soft to soft, sub blocky, argillaceous, very calcareous, occasionally pyritic, very glauconitic (disseminated and nodular) in part.
1180	1185	5	SANDSTONE: light grey, fine to very coarse grained, poorly sorted, subangular to subrounded, weak - moderate siliceous cement, white argillaceous matrix, common glauconite, trace mica, fair inferred porosity, no shows.
		95	SILTSTONE: as above.
1185	1190	90	SANDSTONE: as above.
		10	SILTSTONE: as per 1175 - 1180mRT.
1190	1195	100	SANDSTONE: colourless to translucent, fine to very coarse grained, poor sorting, subrounded (fine) to subangular (coarse), weak siliceous cement, abundant quartz overgrowths, trace white silty matrix, trace glauconite, friable, good inferred porosity, no shows.
1195	1200	100	SANDSTONE: as above.
1200	1205	90	SANDSTONE: as per 1190 - 1195mRT.
		5	SILTSTONE: pale to medium grey & brown, argillaceous, common carbonaceous laminations, scattered carbonaceous specks, trace mica, firm, subblocky.
		5	COAL: black, dull, subconchoidal fracture.
1205	1210	100	SANDSTONE: translucent to off white, fine to very coarse grained, poor sorting, subrounded (fine) to subangular (coarse), weak siliceous cement, abundant quartz overgrowths, trace white silty matrix, friable, good inferred porosity. 5% moderately bright, yellow, patchy to solid fluorescence, slow diffuse to instant yellow crush cut, thin ring residue.
1210	1215	100	SANDSTONE: as above. Trace fluorescence as above.
1215	1220	90	SANDSTONE: translucent to off white, medium to very coarse grained, poor sorting, subangular, weak to moderate siliceous cement, abundant quartz overgrowths, generally clean, trace white silty matrix, rare pyrite & glauconite nodules, friable to moderately hard (where cemented), good inferred porosity, poor visual porosity where cemented. Trace fluorescence as per 1205-1210mRT.
		10	SILTSTONE: pale to medium brown, argillaceous, common carbonaceous, lithic & glauconite fragments, firm - moderately hard, subblocky.
1220	1225	100	SANDSTONE: as above, no shows.
1225	1230	100	SANDSTONE: colourless to translucent, fine to very coarse grained, poor sorting, subangular, weak to moderate siliceous cement, abundant quartz overgrowths, generally clean, trace pyrite & glauconite nodules, friable to moderately hard (where cemented), good inferred porosity, poor visual porosity where cemented, no shows.
		Trc	SILTSTONE: medium brown/grey, argillaceous, scattered very fine carbonaceous & glauconite specks, firm - moderately hard, subblocky.
1230	1235	100	SANDSTONE: as above.
1235	1240	60	SANDSTONE: colourless to translucent, fine to very coarse grained, poor sorting, subangular to occasionally subrounded, good inferred porosity, no shows.
		30	COAL: black, dull, grading to carbonaceous siltstone, brittle, blocky.

West Whiptail-1 Lithology/Show Descriptions

Interval (m)		Lithology / Show Description	
From	To	%	
		10	SILTSTONE: as above.
1240	1245	60	SANDSTONE: translucent to pale brown, fine to coarse grained, predominantly fine to medium grained, moderate sorting, subangular to subrounded, weak siliceous cement, common brown silty matrix, friable, good inferred porosity, no shows.
		30	SILTSTONE: brown, argillaceous, common carbonaceous fragments, common glauconite nodules, firm - moderately hard, subblocky.
		10	COAL: as above.
1245	1250	60	SANDSTONE: as above.
		30	SILTSTONE: brown, argillaceous, common carbonaceous fragments, trace pyrite, common glauconite nodules, firm - moderately hard, subblocky.
		10	COAL: as above.
1250	1255	50	SANDSTONE: as per 1240 - 1245mRT.
		30	SILTSTONE: as above.
		20	COAL: black, dull, grading to carbonaceous siltstone, brittle, blocky.
1255	1260	20	SANDSTONE: as per 1240 - 1245mRT.
		60	SILTSTONE (1): medium brown, argillaceous, common carbonaceous & glauconite nodules, common carbonaceous laminations, moderately hard, subblocky. SILTSTONE (2): very pale green/grey, argillaceous & arenaceous in part, calcareous, common lithic fragments, moderately hard, subblocky.
		20	COAL: as above.
1260	1265	60	SANDSTONE: pale grey/brown, off white, very fine to medium grained, rare coarse grained, moderate sorting, subangular to rounded, moderate to weak siliceous & calcareous cements, common white silty matrix, trace glauconite, friable to moderately hard, fair inferred porosity, poor visible porosity. Fluorescence associated with tight sandstone, 5% dull, solid, yellow fluorescence, slow crush cut, thin yellow/white film residue.
		30	SILTSTONE: types 1 & 2.
		10	COAL: as per 1250 - 1255mRT.
1265	1270	90	SANDSTONE: translucent to colourless, very fine to occasionally coarse grained, predominantly medium grained, moderate sorting, subangular to generally subrounded, weak siliceous cement, clean, friable, good inferred porosity. Trace fluorescence in tight aggregates, as above.
		5	SILTSTONE: types 1 & 2, as per 1255-1260mRT.
		5	COAL: as per 1250 - 1255mRT.
1270	1275	80	SANDSTONE: as above but very fine to coarse grained & poor sorting.
		20	SILTSTONE (1): brown, argillaceous, common carbonaceous & glauconite nodules, common carbonaceous laminations, firm, subblocky. SILTSTONE (2): very pale green/grey, argillaceous & arenaceous in part, calcareous, firm - moderately hard, subangular - subblocky.
		10	COAL: black, dull, grading to carbonaceous siltstone, brittle, blocky.
1275	1280	60	SANDSTONE: translucent to pale grey/brown, very fine to occasionally coarse grained, predominantly fine to medium grained, moderate sorting, subangular to generally subrounded, weak siliceous cement, common silty matrix, friable, poor to fair inferred porosity, no shows.
		20	SILTSTONE: types 1 & 2 as above.
		20	COAL: black, dull, grading to carbonaceous siltstone, brittle, blocky.

West Whiptail-1 Lithology/Show Descriptions

Interval (m)		Lithology / Show Description	
From	To	%	
1280	1285	100	SANDSTONE: colourless to translucent, medium to very coarse grained, poor sorting, subangular to occasionally subrounded, weak siliceous cement, clean, friable, good inferred porosity, no shows.
1285	1290	100	SANDSTONE: as above.
1290	1295	100	SANDSTONE: colourless to translucent, medium to very coarse grained, poor sorting, subangular to angular, weak siliceous cement, abundant quartz overgrowths, clean, friable, good inferred porosity, no shows.
1295	1300	100	SANDSTONE: colourless to translucent, fine to medium grained, occasionally coarse, moderate sorting, subrounded, weak siliceous cement, quartz overgrowths where coarse, clean, friable, good inferred porosity, no shows.
1300	1310	95	SANDSTONE: colourless to translucent, off white, fine to very coarse grained, poor sorting, subangular to subrounded, weak siliceous cement, abundant quartz overgrowths, clean, friable, good to excellent inferred porosity, no shows.
		5	SILTSTONE: types 1 & 2 as per 1270 - 1275mRT.
1310	1320	80	SANDSTONE: as above.
		10	SILTSTONE (1): dark red/brown, argillaceous, abundant carbonaceous laminations, blocky, firm. SILTSTONE (2): very pale green/grey, argillaceous & arenaceous in part, calcareous, firm - moderately hard, subangular - subblocky.
		10	COAL: black, dull, grading to carbonaceous siltstone, brittle, blocky.
1320	1330	90	SANDSTONE: colourless to translucent, fine to very coarse, predominantly medium grained, poorly sorted, angular (coarse) - subrounded, weak siliceous cement, quartz overgrowths where coarse, clean, trace pyrite, friable, good inferred porosity, no shows.
		10	SILTSTONE (1): medium brown, argillaceous, common carbonaceous material, abundant glauconite nodules, moderately hard¸ subblocky. SILTSTONE (2): very pale green/grey, argillaceous & arenaceous in part, calcareous, firm - moderately hard, subangular - subblocky.
1330	1340	100	SANDSTONE: as above.
1340	1350	50	SANDSTONE: as per 1320-1330mRT but generally fine to medium grained, no shows.
		40	SILTSTONE (1): medium brown, argillaceous, abundant carbonaceous material, moderately hard¸ subblocky. SILTSTONE (2): very pale green/grey, argillaceous, calcareous, firm - moderately hard, subangular - subblocky. SILTSTONE (3): dark red/brown, argillaceous, abundant carbonaceous laminations, blocky, firm.
		10	COAL: black, dull, grading to carbonaceous siltstone, brittle, blocky.
1350	1360	100	SANDSTONE: colourless to translucent, fine to very coarse, poorly sorted, subangular (coarse) - subrounded (fine), weak siliceous cement, quartz overgrowths where coarse, clean, friable, good to excellent inferred porosity, no shows.
		Trc	SILTSTONE: types 1 & 2 as above.
1360	1370	100	SANDSTONE: as above.
1370	1380	95	SANDSTONE: as per 1350-1360mRT.
		5	SILTSTONE (1): pale grey to medium brown, argillaceous, common carbonaceous material, firm¸ subblocky. SILTSTONE (2): very pale green/grey, argillaceous, very calcareous, moderately hard, subblocky.
1380	1385	95	SANDSTONE: as per 1350-1360mRT.

West Whiptail-1 Lithology/Show Descriptions

Interval (m)		Lithology / Show Description	
From	To	%	
			SILTSTONE: types 1 & 2 as above.
1385	1390	90	SANDSTONE: colourless to off white, fine to very coarse, poorly sorted, subangular (coarse) - subrounded (fine), weak siliceous cement, quartz overgrowths where coarse, clean, friable, good inferred porosity, no shows.
		10	SILTSTONE: medium brown, argillaceous, common carbonaceous material, scattered pyrite & glauconite nodules, firm¸ subblocky. SILTSTONE (2): very pale green/grey, argillaceous, very calcareous, moderately hard, subblocky.
		Trc	COAL: black, dull, silty, brittle, subconchoidal fracture.
1390	1395	95	SANDSTONE: colourless to off white, fine to coarse, predominantly medium to coarse grained, moderately well sorted, subangular (coarse) - subrounded (fine), weak siliceous cement, common quartz overgrowths where coarse, clean, friable, good inferred porosity, no shows.
		5	SILTSTONE: types 1 & 2 as above.
1395	1400	95	SANDSTONE: colourless to off white, fine to coarse, predominantly medium to coarse grained, moderately well sorted, subangular (coarse) - subrounded (fine), weak siliceous cement, common quartz overgrowths where coarse, clean, friable, good inferred porosity, no shows.
		5	SILTSTONE: types 1 & 2 as above.
1400	1405	50	SANDSTONE: clear to translucent, loose, medium to very coarse, predominantly medium to coarse, moderately sorted, sub rounded to angular, clean, trace siliceous and pyritic cement, good inferred porosity.
		50	SILTSTONE: (1) light to medium brown, occasionally brown / black, soft to firm, sub blocky to fissile, argillaceous to occasionally arenaceous, common carbonaceous material and carbonaceous laminae, grading to CARBONACEOUS SILTSTONE in part. SILTSTONE (2): (trace) very pale green/grey, firm, sub blocky, argillaceous, very calcareous.
1405	1410	60	SANDSTONE: as above
		40	SILTSTONE: as above
1410	1415	20	SANDSTONE: clear to translucent, loose, fine to coarse, rarely very coarse, moderately sorted, sub rounded to angular, clean, trace siliceous and pyritic cement, good inferred porosity. Trace FLUORESCENCE: dull yellow pinpoint, no direct cut, trace very slow crush cut, trace white residue ring.
		80	SILTSTONE: light to medium brown, occasionally brown / black, soft to firm, sub blocky to fissile, argillaceous to occasionally arenaceous, common carbonaceous material and carbonaceous laminae.
1415	1420	70	SANDSTONE: clear - translucent, loose, fine - very coarse, predominantly coarse - very coarse, poorly sorted, sub rounded - sub angular, occasional angular fractured grains, clean, trace white argillaceous matrix, good inferred porosity.
		30	SILTSTONE: (1) light to medium brown, occasionally brown / black, soft to firm, sub blocky to fissile, argillaceous to occasionally arenaceous, common carbonaceous material and carbonaceous laminae. SILTSTONE (2): (trace) very pale green/grey, firm, sub blocky, argillaceous, very calcareous.
		tr	COAL: black, dull - vitreous, firm, brittle, uneven - sub conchoidal fracture, slightly silty in part.
1420	1425	100	SANDSTONE: as above
1425	1430	80	SANDSTONE: clear - translucent, loose, coarse - very coarse, predominantly, poorly sorted, sub rounded - sub angular, occasional angular fractured grains, clean, trace weak siliceous cement, good inferred porosity.

West Whiptail-1 Lithology/Show Descriptions

Interval (m)		Lithology / Show Description	
From	To	%	
		10	SILTSTONE: light to medium brown, occasionally brown / black, soft to firm, sub blocky to fissile, argillaceous to occasionally arenaceous, common carbonaceous material and carbonaceous laminae.
		10	COAL: black, dull to vitreous, uneven to sub conchoidal fracture, brittle, slightly silty in part.
1430	1435	50	SANDSTONE: clear - translucent, loose, medium - very coarse, commonly coarse to very coarse, sub angular to sub rounded, poorly sorted, trace weak siliceous cement, trace white argillaceous matrix, good inferred porosity no fluorescence.
		30	SILTSTONE: brownish grey - brownish black, firm, blocky - fissile, brittle in part, micro micaceous, very carbonaceous, common carbonaceous laminae and gradational to CARBONACEOUS SILTSTONE.
		20	COAL: as above
1435	1440	30	SANDSTONE: clear - translucent, loose, medium - very coarse, sub angular to sub rounded, poorly sorted, trace weak siliceous cement, trace white argillaceous matrix, good inferred porosity no fluorescence.
		70	SILTSTONE: (1) light brownish grey, occasionally light brown, very soft, dispersive in part, very argillaceous, occasional carbonaceous specks and laminae. (2) trace greenish grey, firm, subblocky to blocky, argillaceous, calcareous, occasionally glauconitic.
1440	1445	20	SANDSTONE: as above
		70	SILTSTONE: (1) light brownish grey, occasionally light brown, very soft, dispersive in part, very argillaceous, occasional carbonaceous specks and laminae. (2) trace greenish grey, firm, subblocky to blocky, argillaceous, calcareous, occasionally glauconitic.
		10	COAL: as above
1445	1450	50	SANDSTONE: clear - translucent, loose, medium - very coarse, sub angular to sub rounded, poorly sorted, trace weak siliceous cement, trace white argillaceous matrix, good inferred porosity no fluorescence.
		50	SILTSTONE: (1) light brownish grey, occasionally light brown, very soft, dispersive in part, very argillaceous, occasional carbonaceous specks and laminae. (2) trace greenish grey, firm, subblocky to blocky, argillaceous, calcareous, occasionally glauconitic.
1450	1455	20	SANDSTONE: clear - translucent, loose, medium - very coarse, commonly coarse to very coarse, sub angular to sub rounded, poorly sorted, trace weak siliceous cement, trace white argillaceous matrix, good inferred porosity no fluorescence.
		80	SILTSTONE: (1) light brownish grey, occasionally light brown, very soft, very argillaceous, trace micro mica, common carbonaceous specks and laminae. (2) (trace) greenish grey, firm, subblocky to blocky, argillaceous, calcareous, occasionally glauconitic.
1455	1460	80	SANDSTONE: clear - translucent, milky white, loose, medium to very coarse, dominantly coarse to very coarse, sub angular - sub rounded, weak siliceous cement, trace strong pyritic cement, trace white argillaceous matrix adhering to the grains, goon inferred porosity, no hydrocarbon fluorescence.
		20	SILTSTONE: as above
1460	1465	80	SANDSTONE: as above

West Whiptail-1 Lithology/Show Descriptions

Interval (m)		Lithology / Show Description	
From	To	%	
		20	SILTSTONE: brownish grey, brownish black, dark reddish brown, firm, blocky brittle, very carbonaceous, gradational to CARBONACEOUS SILTSTONE.
		20	COAL: black, dull, firm, brittle, uneven to rare sub conchoidal fracture, silty in part, gradational to and intercalated with CARBONACEOUS SILTSTONE.
1465	1470	90	SANDSTONE: clear - translucent, loose, dominantly medium to coarse, occasionally very coarse, moderately sorted, subangular to sub rounded, trace weak siliceous cement, trace off white / light brown argillaceous matrix, good inferred porosity, no fluorescence.
		10	SILTSTONE: brownish grey, brownish black, dark reddish brown, firm, blocky brittle, common carbonaceous specks and laminae.
		tr	COAL: as above
1470	1475	90	SANDSTONE: as above
		10	SILTSTONE: (1) light to medium brown, soft - very soft, occasionally firm, subblocky, very argillaceous, micro mica, carbonaceous specks and laminae, trace glauconite. (2) trace light greenish grey, occasionally pale bluish grey, firm, sub blocky to blocky calcareous, homogenous.
1475	1480	100	SANDSTONE: clear - translucent, occasionally milky white grains, loose, coarse to very coarse, rare medium grains, sub angular to sub rounded, occasionally very angular and fractured, poorly sorted, clean, good inferred porosity, no shows.
1480	1485	90	SANDSTONE: as above
		10	SILTSTONE: (1) light to medium brown, soft - very soft, occasionally firm, subblocky, very argillaceous, micro mica, carbonaceous specks and laminae, trace glauconite. (2) minor component: light greenish grey, occasionally pale bluish grey, firm, sub blocky to blocky calcareous, homogenous.
1485	1490	100	SANDSTONE: clear - translucent, loose, fine to very coarse, commonly coarse to very coarse, sub angular to sub rounded, occasionally very angular and fractured, poorly sorted, clean, trace off-white argillaceous matrix, good inferred porosity, no shows.
1490	1495	100	SANDSTONE: clear - translucent, loose, fine - very coarse, very poorly sorted, sub angular - rounded, weak siliceous cement, trace argillaceous matrix, good inferred porosity, no fluorescence.
1495	1500	90	SANDSTONE: clear - translucent, white, loose, medium - very coarse, poorly sorted, sub rounded - angular, weak siliceous cement, common white argillaceous matrix washing out, good inferred porosity, no fluorescence.
		10	SILTSTONE: as above
		tr	COAL: as above
1500	1505	90	SANDSTONE: clear - translucent, white, loose, medium - very coarse, dominantly coarse to very coarse, sub rounded - angular, moderately sorted, trace weak siliceous cement, abundant off white argillaceous matrix washing out, good inferred porosity, no fluorescence.
		10	SILTSTONE: (1) medium to dark brown, occasionally light medium grey, soft - firm, sub blocky - sub fissile in part, common carbonaceous specks, glauconitic. (2) minor component greenish grey, firm, sub blocky, calcareous, homogenous.
1505	1510	80	SANDSTONE: as above
		20	SILTSTONE: as above
1510	1515	70	SANDSTONE

West Whiptail-1 Lithology/Show Descriptions

Interval (m)		Lithology / Show Description	
From	To	%	
		30	SILTSTONE: pale greenish grey, rare yellowish grey, light bluish grey, soft - firm, sub blocky, argillaceous, calcareous,
		tr	COAL: black, brownish black, dull to sub vitreous, firm, brittle, uneven fracture, silty.
1515	1520	100	SANDSTONE: clear - translucent, loose, medium - very coarse, dominantly medium to coarse, sub angular - sub rounded, moderately sorted, clean, trace pyrite cement, good inferred porosity, no fluorescence.
1520	1525	100	SANDSTONE: as above
1525	1530	90	SANDSTONE: clear - translucent, loose, medium - very coarse, dominantly medium to coarse, sub angular - sub rounded, moderately sorted, clean, occasional very strong pyrite cement, good inferred porosity, no fluorescence.
		10	SILTSTONE: (1) medium to dark brown, occasionally light medium grey, soft - firm, sub blocky - sub fissile in part, common carbonaceous specks and carbonaceous laminae, glauconitic. (2) minor component greenish grey, firm, sub blocky, calcareous, homogenous.
1530	1535	80	SANDSTONE: clear - translucent, loose, medium - very coarse, dominantly medium to coarse, sub angular - sub rounded, moderately sorted, minor white argillaceous matrix washing out, occasional very strong pyrite cement, good inferred porosity, no fluorescence.
		20	SILTSTONE: (1) brownish grey, light grey, soft - firm, sub blocky, micro mica, carbonaceous specks and laminae, glauconitic, occasionally pyritic. (2) minor component: greenish grey, firm, sub blocky, calcareous, homogenous.
1535	1539	80	SANDSTONE: clear - translucent, loose, medium - very coarse, dominantly medium to coarse, sub angular - sub rounded, moderately sorted, abundant white argillaceous matrix washing out, good inferred porosity, no fluorescence.
	TD	20	SILTSTONE: (1) brownish grey, light grey, soft - firm, sub blocky, micro mica, carbonaceous specks and laminae, glauconitic, occasionally gradational to CARBONACEOUS SILTSTONE. (2) minor component: greenish grey, firm, sub blocky, calcareous, homogenous.

APPENDIX 2

MDT RESULTS

ESSO AUSTRALIA PTY LTD

Well: Westwhiptail-1
Date: 22-May-04
Tool Type (MDT-GR-LEHQT)
Gauge Type: CQG
Pressure units (psia, psig) psia

Near vertical Well
Maximum Inclination 8 deg
Hole angle offset -2.5m to TVD

Geologist: Mike Woodmansee
KB (metres): 39.0
Probe type: Large
Temperature units: Deg C

Point No	Reeves Depth mMD	Schlumberger Depth mMD	Reeves Depth mTVDSS	Schlumberger Depth mTVDSS	Strain Gauge Hydrostatic Before	Strain Gauge PPG	Strain Gauge Reservoir	PSIG PPG	Quartz Gauge Hydrostatic Before	Quartz Gauge PPG	Quartz Gauge Reservoir	PSIA PPG	Temp	Strain hyd after	Qtz hyd after	Mobility Ratio	Comments
1		1364.00		1322.50	2424.40	10.8	1858.20	#DIV/0!	2434.36	10.8	1867.84	#DIV/0!	63.10	2424.80	2434.21	15860.0	20cc drawdown
2		1373.00		1331.50	2440.90	10.8	1871.10		2450.29	10.8	1880.38		63.80	2441.20	2450.05	118.6	20cc drawdown
3		1390.00		1348.50	2471.00	10.8	1894.80		2480.09	10.8	1903.99		64.20	2471.00	2480.02	14665.0	20cc drawdown
4		1398.40		1356.90	2485.90	10.8	1906.50		2494.99	10.8	1915.67		65.00	2484.90	2494.87	767.2	20cc drawdown
5		1407.00		1365.50	2501.12	10.7			2510.20	10.8							tight retrace move up 0.5m
6		1406.50		1365.00	2500.10	10.7			2509.28	10.8							5cc drawdown, tight retract
7		1407.50		1366.00	2501.80	10.7			2511.04	10.8							1500psi pressure limited draw down, tight retract
8		1410.50		1369.00	2507.00	10.7	1926.80		2516.19	10.8	1936.18		66.50	2506.90	2516.13	2362.2	10cc drawdown
9		1412.50		1371.00	2510.50	10.7	1929.10		2519.70	10.8	1938.40		66.80	2510.40	2519.61	193.2	20cc drawdown
10		1414.00		1372.50	2513.20	10.7	1930.80		2522.38	10.8	1940.13		67.30	2512.90	2522.15	4.1	20cc drawdown, slow but ok
11		1420.50		1379.00	2524.50	10.7	1937.40		2533.72	10.8	1946.78		67.40	2524.40	2533.62	252.7	20cc drawdown
12		1425.00		1383.50	2532.40	10.7	1943.60		2541.62	10.8	1953.00		67.60	2532.20	2541.55	3803.0	20cc drawdown
13		1430.50		1389.00	2542.00	10.7	1951.30		2551.27	10.8	1960.67		67.90	2542.10	2551.24	2084.0	20cc drawdown
14		1440.00		1398.50	2559.00	10.7	1966.70		2568.18	10.8	1976.03		68.00	2558.50	2568.16	506.0	20cc drawdown
15		1461.00		1419.50	2596.10	10.7	1997.00		2605.40	10.8	2006.43		68.30	2596.00	2605.27	3363.0	20cc drawdown
16		1470.00		1428.50	2612.20	10.7	2010.30		2621.50	10.8	2019.67		68.60	2612.10	2621.37	4115.0	20cc drawdown
17		1412.50		1371.00	2510.70	10.7	1929.40		2519.31	10.8	1938.47		67.20	2510.30	2519.32		20cc drawdown, divert to LFA and then sample 1 gallon followed by 4 MPSR, plus one malfunctioned MPSR. Total 5 MPSR's.
18		1418.50		1377.00	2519.70	10.7			2529.22	10.8			70.10	2119.20	2529.28		10cc drawdown, tight
		1419.00		1377.50	2520.70	10.7	1935.60		2580.08	11.0	1945.19		70.90	2520.40	2530.06	116.0	10cc, Diverted flow through LFA after 55min and 18.7lt pumped LFA indicated water.
19		1413.80		1372.30	2511.40	10.7	1931.50		2520.76	10.8	1940.99		70.10	2511.40	2520.74	1.3	20cc drawdown. Attempt pumpout but formation to tight
20		1413.50		1372.00	2510.80	10.7	1930.30		2520.19	10.8	1939.82		69.50	2510.50	2520.54	71.4	20cc drawdown, lost seal, reset probe, LFA indicated OIL.

Well:		West Whiptail-1							
A. Sample Identification									
Run/seat number	#/#	17	17	17	17	17	17		
Sample depth	md m rkb	1412.5	1412.5	1412.5	1412.5	1412.5	1412.5		
Pretest volume	cc	20 ccs	n/a	n/a	n/a	n/a	n/a		
Chamber size	cc/litre/gallon	1 gallon	450cc	450cc	450cc	450cc	450cc		
Chamber serial number	#	19	478	494	1178	1695	1760		
Probe type		Large	Large	Large	Large	Large	Large		
Choke size		n/a	n/a	n/a	n/a	n/a	n/a		
B. Sampling History									
Date	dd/mm/yy	22/5/04	22/5/04	22/5/04	22/5/04	22/5/04	22/5/04		
Initial hydrostatic	psia	2519.32	2519.32	2519.32	2519.32	2519.32	2519.32		
Tool Set	hh:mm	5:10	n/a	n/a	n/a	n/a	n/a		
Pretest start	hh:mm	5:11	n/a	n/a	n/a	n/a	n/a		
Initial formation pressure (prete	psia	1938.47	1938.47	1938.47	1938.47	1938.47	1938.47		
Pretest end	hh:mm	5:12	n/a	n/a	n/a	n/a	n/a		
Pretest duration	*hh:mm*	0:01	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*		
Pumpout start	hh:mm	5:13	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*		
Pumpout end	hh:mm	6:10	*6:25*	*6:45*	*6:53*	*6:59*	*7:03*		
Pumpout duration	*hh:mm*	57min / 20min							
Pumpout volume	litres	1 gallon	450cc	450cc	450cc	450cc	450cc		
LFA indication	colour	green	green	green	green	green	green		
Interpreted fluid at LFA	-	oil	oil	oil	oil	oil	oil		
Final resisitivity at probe	ohm-m	0.595	0.7603	0.5495	0.693	0.7003	0.695		
Chamber open	hh:mm	6:10	6:38	6:48	6:55	7:00	7:06		
Minimum sampling pressure	psia	800	1770.0	1770.0	1770.0	1770.0	1770.0		
Final formation pressure	psia								
Seal chamber	hh:mm	6:25	6:45	6:53	6:59	7:03	7:09		
Chamber fill time	*hh:mm*	*15min*	*7min*	*5min*	*4min*	*3min*	*3min*		
Tool retract	hh:mm	not retracted	not retracted	not retracted	not retracted	not retracted	7:12		
Final hydrostatic	psia	n/a	n/a	n/a	n/a	n/a	2519.4		
Total time	*hh:mm*	*1:15*	*0:20*	*0:08*	*0:06*	*0:04*	*0:09*		
C. Sample Downhole Temperature And Resistivity									
At sample depth (AMS)	degC	67.2	67.2	67.2	67.2	67.2	67.2		
Rm@sample depth (AMS)	ohm-m								
D. Sample Recovery At Surface									
Surface opening pressure	psig								
Volume gas	cuft								
Volume oil/condensate	litres								
Volume water/filtrate	litres								
E. Sample Properties Measured On-Site									
Gas via ch C1	Mole %		0	0	0	0	0	0	0
C2	Mole %		0	0	0	0	0	0	0
C3	Mole %		0	0	0	0	0	0	0
C4	Mole %		0	0	0	0	0	0	0
C5	Mole %		0	0	0	0	0	0	0
C6+	Mole %								
CO2	Mole %		0	0	0	0	0	0	0
H2S	Mole %	0	0	0	0	0	0	0	0
Oil/Conder API @ degC	degrees	0	0	0	0	0	0	0	0
Colour									
Fluorescence									
GOR or CGR	cuft/bbl or mmscf/bbl	0	0	0	0	0	0	0	0
Pour point	degC	0	0	0	0	0	0	0	0
Water/Filtr Rmud @ degC	ohm-m@degC	0	0	0	0	0	0	0	0
K+ ion calculated fr	ppm	0	0	0	0	0	0	0	0
Chlorides titrated	ppm	0	0	0	0	0	0	0	0
Tritium	DPM								
pH		0	0	0	0	0	0	0	0
Type									
F. Mud Filtrate Properties									
Rmud @ degC	ohm-m@degC		0.1233/25.5c	0.1233/25.5c	0.1233/25.5c	0.1233/25.5c	0.1233/25.5c	0	0
K+ ion calculated from KCL%	ppm		0	0	0	0	0	0	0
Chlorides titrated	ppm		0	0	0	0	0	0	0
pH			0	0	0	0	0	0	0
Tritium	DPM								
G. General Calibration									
Reported mud weight	ppg	10.2	10.2	10.2	10.2	10.2	10.2	0	0
Calculated hydrostatic	*psia*		*2455*	*2455*	*2455*	*2455*	*2455*	*0*	*0*
H. Remarks and Comments									
General	*Sample Specific*	*Sample Specific*	*Sample Specifi*	*ample Specifi*	*ample Specifi*	*ample Specific*	*Sample Specific*	*mple Speci*	*mple Specific*

NOTE: 1 For 1 gallon sample. Re-set probe after 37 minuites of pumping due to poor LFA responce and high sample pressure. The sample pump was working ok but it os unclear whether the MDT had a poor seal or a partially opened valve. We reset the probe and pumped for a further 20min. The fluid cleaned to oil straight away suggesting to me that the initial pumping was effective in cleaning up the formation fluid.

Note:2 Sample chamber 1695, unreliable sample, chamber opened after it was closed.

APPENDIX 3

MUDLOGGING REPORT

WEST WHIPTAIL 1

FINAL WELL REPORT

Prepared by
Geoservices Overseas Oilfield Services SA
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CONTENTS

Section 1
General Well Summary

WELL DATA

Operator	: ESSO Australia Ltd
Well name	: West Whiptail 1
Country	: Australia
Location	: Gippsland Basin
Field	: Whiptail
Permit	: Vic/L1
Location AMG co-ordinates	: 544,121.32m E 5,758,030.22 m N
Location local co-ordinates	: Lat: 38° 19' 29.15" S Long: 147° 30' 17.167" E
Profile	: Vertical
Reference depth	: Rotary Table
RT to Seabed	: 78 metres
RT above M.S.L.	: 39 metres
Sea-water depth	: 39 metres
Proposed total depth	: 1539 metres
Actual total depth	: 1539 metres
True vertical depth	: 1539 metres
Spudded on	: 10th May 2004
Total depth reached on	: 20th May 2004

Drilling Contractor

Drilling Contractor	: ENSCO
Rig name	: 102
Rig type	: Jackup

Drilling Phases

Diameter (inch)	From (mMDRT)	To (mMDRT)	Mud Type
12 ¼"	120	750	
8 ½"	750	1539	KCl / Glycol / PHPA

Cased Hole

Casing Diameter (inch)	Casing Type	Shoe Depth (mMDRT)
13 3/8"	Conductor	120
9 5/8"	Surface	745

MUD LOGGING

Logging Unit Number: 171

Engineers: M. Boyd, M. Smith, P. Rady.

Sampling Interval

Halibut A6A

Sample Type	Number of sets	Quantity per set	Sampling interval	From (m)	To (m)
Washed and Dried	4	100 grams	30 metres	150	1040
Washed and Dried	4	100 grams	5 metres	1040	1539

Cuttings Distribution

Company	Washed and Dried Sample Set
Esso Australia	1
Victorian Department of Energy and Minerals	1
Australian Bureau of Resources	1

DRILLING SUMMARY

Spudded in at 23:00 hours on the 10th of May 2004 West Whiptail 1 was a Near Field Wildcat vertical well designed to test the Intra-Latrobe Group dip closure located between the Whiptail and Mulloway discoveries. The well was drilled to a Total Depth of 1539 mMDRT in a 3 phase drilling programme.

CONDUCTOR
The 17½" section was drilled using a 17½" Security EBXT1G bit on a 36" hole opener to a depth of 123 mMDRT, then 30" casing was run and cemented at 120 mMDRT.
Drilling parameters for this section of the hole were not recorded by Geoservices as the unit was in the initial rigging up stage during this section of the well. Returns for this section of the well went directly to the seafloor.
This section was drilled with seawater and HiVis pills, pumped every 15 metres, at TD a 100bbl hi vis pill was pumped. A wiper trip was performed and once back on bottom another 50bbl sweep was pumped, chased with seawater prior to the hole being displaced with 200 bbls of HiVis mud. Another 260 bbls HiVis mud was spotted on bottom once the bit had been pulled to 91m.

BIT RUN No. 1
The 12¼" second section was drilled to a depth of 750 mMDRT using a 12¼" Smith S91HPX bit. The $9^5/_8$" casing was run and cemented at 745 m. Geoservices were rigged up and operational from the start of the 12¼" hole section. Prior to drilling out of the $13^3/_8$" casing shoe, the hole was displaced to a Seawater/Bentonite Mud system. During the 12¼"open hole section the mud system was diluted with seawater and premix added to control solids build up whilst maintaining the mud properties.
<u>Drilling Parameters</u>
WOB 2 - 5 klbs average 4klbs
RPM 50 - 140, average 100
Torque 1000 – 3780 lb/ft average 2140 lb/ft
Stand Pipe Pressure 2080 – 3300 psi average 2620psi
Flow 640 – 1100 gpm average 1005 gpm
Lithology
Calcarenite and Calcisiltite with minor Sandstone

BIT RUN No. 2
The final 8½" section was drilled with a Smith S75HPX bit. The cement, $9^5/_8$" casing shoe and 3 metres of new formation were drilled, prior to a PIT (14.3 ppg EMW 590 psi) being performed using 9.7 ppg mud. The final section was drilled to TD at 09:00 Hrs on the 20th May 2004 at the prognosed depth of 1539m.
Seawater was initially used to drill out the shoe track. The hole was then displaced to a 9.7ppg KCL / PHPA / Glycol mud system before drilling out the $9^5/_8$" casing shoe. Once in open hole the mud volume was maintained with additions of premix with mud properties maintained with additions of Glycol, Baracor-129 and Caustic Potash and PHPA. During the Gippsland Limestone formation the Mud weight was maintained at 9.7 ppg but was allowed to increase with the influx of native clays prior to drilling the Lakes Entrance formation with a maximum mud weight of 9.95 ppg being reached by TD. The active mud system was also treated with 5 ppb Baracarb-25 and 5 ppb Baracarb-100 prior to entering the Latrobe formation to keep fluid losses into the formation at a minimum.
<u>Drilling Parameters</u>
WOB 3-10klbs average 5
RPM 70 – 150 average 130
Torque 1100 – 5930 average 2700
Stand Pipe Pressure 2500 - 3850psi average 3400psi
Flow 640 – 870gpm average 840gpm
Lithology
836m – 1179m Calcilutite grading to Marl with minor Siltstone
1179m – TD Sandstone with minor Siltstone grading to Sandstone and interbedded Siltstone and minor Coal with depth.

Logging and end of well
West Whiptail 1 reached a Total Depth of 1539 m at 09:00 hours on the 20th May 2004. A wiper trip was made to the $9^5/_8$" casing shoe prior to pulling out of the hole to run the Schlumberger electrical logs. Four runs were programmed with Run 1-PEX-HALS-HNGS-DSI, completed successfully but whilst running in hole for Run 2 MDT-GR, the tool was unable to progress past 1240m and so was pulled out of hole. Another wiper trip was run and the section between 1240 m to 1270 m was reamed. The MDT run was then completed successfully as were Run 3-CSAT-GR and Run 4-CSAT.

West Whiptail 1 was plugged back with 6 cement plugs and abandoned.

PRESSURE ANALYSIS

West Whiptail – 1 was a normal pressured well. The pore pressure detection while drilling was monitored and interpreted using non-quantitative analysis. The data used for measuring the well pressure and balance were:
Torque and drag, including overpull when picking up the string and tripping.
Pit levels
Gas in the mud – background gas, connection gas, trip gas, CO_2 and H_2S.
The gas ratio analysis – concentrations of heavier gases.
Cuttings at surface – shape and size, shale analysis.
Temperature of the mud and anomalies associated with.
Mud resistivity.
Changes in these parameters can show whether a well has variations downhole indicating a zone of abnormal pressure. The drilling of the well had no problems associated with an overpressure zone but the presence of connection gases from 1200m indicated an underbalanced mud system for this section of the well. Quantitative detection of pore pressure requires the use of an overpressure log comparing drilling parameters with changes in lithology, compaction and pore pressure. Geoservices use a 'D'-exponent package using the Jordan and Shirley formula, modified for mud density employing the standard 'soft' values for overburden (S) and stress ratio (K). The Eaton models are used to calculate both formation and fracture pressures. Though the package was originally designed for use in under compacted shales in the Gulf of Mexico. Trends can be seen in any well using the logs for interpretation but can be limited. It is also requires constant drilling, with large shale sections present. The use of PDC bits does not help in interpretation of zones of pressure due to differences in drilling character, also with increased rotary with the use of down hole motors.

A KCL/PHPA/Glycol water based mud system was used to drill the 8½ section. mud weight ranged from 9.7 ppg at the start of the section to 9.85 ppg by TD at 1539 m.

A LOT was conducted after drilling out of the $9^5/_8$"casing shoe at 745mMDRT, with a mud weight of 9.7ppg and 590psi, an EMW of 14.3ppg was reached. During the drilling of the well, the ECD ranged from (8.7 ppg in 12¼" hole) 10.70 to 10.85 ppg in 8½" hole section.

The trends shown in this well and changes in anomalies, have been seen to be due to changes in lithology, mud weight and drilling parameters. Within the Limestones drilled it is possible to get over-pressured stringers of Claystone though no anomalies were seen. The well had no problems while drilling and changes in trends and gas can be seen to coincide with the lithology types and formation changes. Gas was low through-out the well. Minor problems seen were due to clays when tripping.

WELL PROFILE

Rotary Table to Mean Sea Level
39.0

Rotary Table to Sea Bed 78 m
30" Conductor Set at 120 m
Plug 2 set at 110m – 170m

Plug 1e set at 669m – 843m

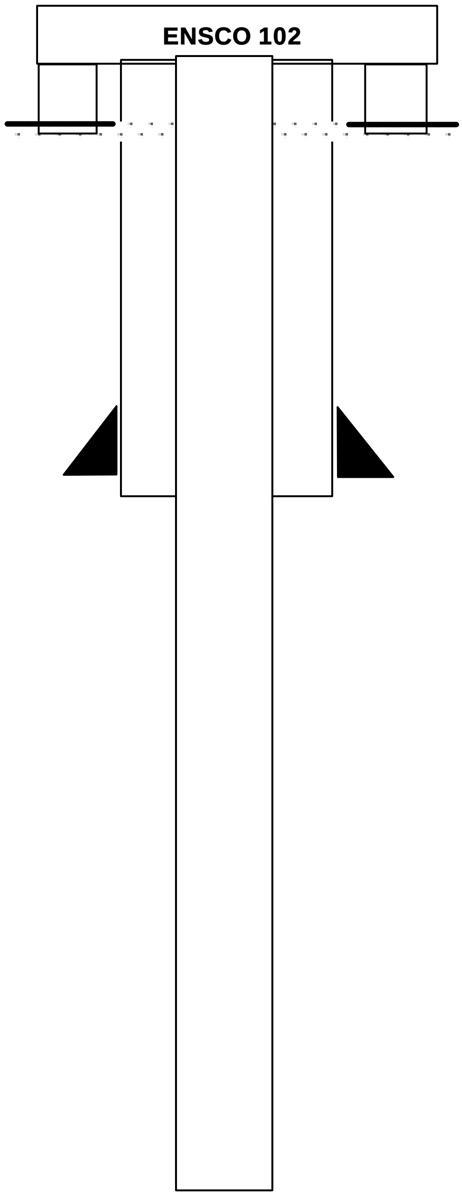
$9\frac{5}{8}$" Casing Set at 745 m

Plug 1d set at 843m – 1017m

Plug 1c set at 1017m – 1191m

Plug 1b set at 1191m – 1365m

Plug 1a set at 1365m – 1539m



ENSCO 102

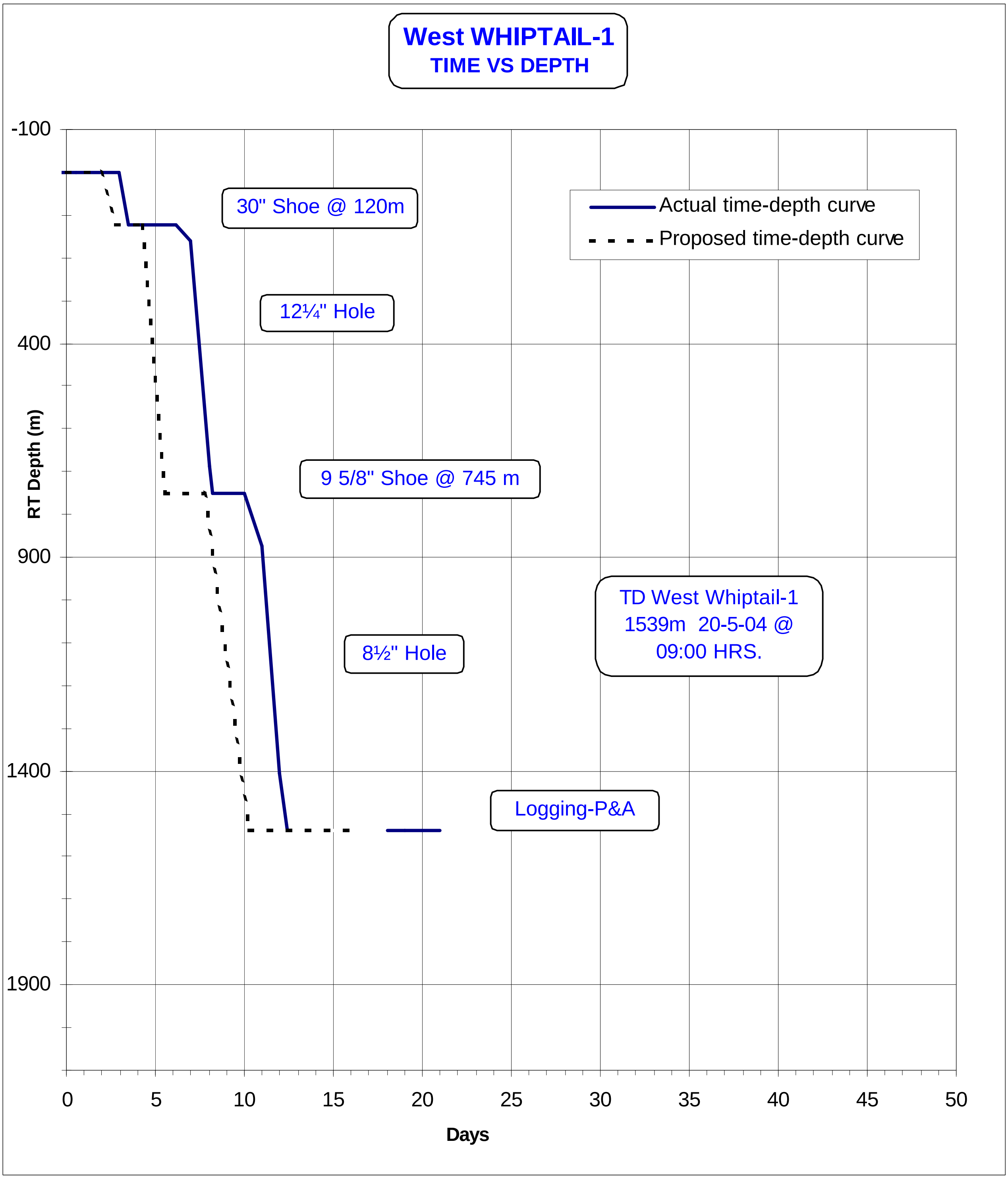
Spudded West Whiptail 1
10th May 2004

12¼" Hole Drilled to 750 m

745.0 m – 1539.0 m
Mud Weight 9.0 – 9.9 ppg

8 ½" Hole drilled to 1539.0 m

DAYS vs. DEPTH



BIT RUN SUMMARY

BIT	Size (")	Type	Jets	In (m)	Out (m)	ROP m/hr	Hours	Condition
2	12¼	SMITH S91HPX	9 x 11	120	750	27.1	23.24	1-1-CT-GX-O-NO-TD
3	8½	SMITH S75HPX	7 x 11	750	1539	24.3	32.37	7-7-LT-X-I-ER-TD

BIT HYDRAULICS SUMMARY

Bit No.	2	Bit No.	2	Bit No.	3
Depth	150	**Depth**	690	**Depth**	840
Size	12¼"	**Size**	12¼"	**Size**	8 ½"
Jets	9 x 11	**Jets**	9 x 11	**Jets**	7 x 11
Mud Density (ppg)	8.55	**Mud Density (ppg)**	9	**Mud Density (ppg)**	9.8
Mud Type	KCL PHPA Glycol	**Mud Type**	KCL PHPA Glycol	**Mud Type**	KCL PHPA Glycol
PV	4	**PV**	7	**PV**	12
YP	14	**YP**	33	**YP**	19
FLOW (gpm)	850	**FLOW (gpm)**	1070	**FLOW (gpm)**	820
Hydraulic Power	233.5 hp	**Hydraulic Power**	488.8	**Hydraulic Power**	714.2
Bit Pressure Loss	464.1 psi	**Bit Pressure Loss**	774	**Bit Pressure Loss**	1468.7
Pipe Pressure Loss	454.6 psi	**Pipe Pressure Loss**	1552	**Pipe Pressure Loss**	1042.3
ECD	8.74	**ECD**	9.2	**ECD**	10.75
Annular Velocities		**Annular Velocities**		**Annular Velocities**	
DP – OH	2.2	**DP – OH**	10.1	**DP – OH**	85.9
DC – OH	1.9	**DC – OH**	4.4	**DC – OH**	26.9
Total Hydr power	583	**Total Hydr power**	1717	**Total Hydr power**	1409

Bit No.	**3**	**Bit No.**	**3**		
Depth	1330	**Depth**	1539 m		
Size	8 ½"	**Size**	8 ½"		
Jets	7 x 11	**Jets**	7 x 11		
Mud Density (ppg)	9.85	**Mud Density (ppg)**	9.9		
Mud Type	KCL PHPA Glycol	**Mud Type**	KCL PHPA Glycol		
PV	18	**PV**	18		
YP	25	**YP**	25		
FLOW (gpm)	850	**FLOW (gpm)**	850		
Hydraulic Power	795.2	**Hydraulic Power**	795.2		
Bit Pressure Loss	1580.5	**Bit Pressure Loss**	1580.5		
Pipe Pressure Loss	1435.8	**Pipe Pressure Loss**	1573.6		
ECD	10.85	**ECD**	10.84		
Annular Velocities		**Annular Velocities**			
DP – OH	107.1	**DP – OH**	107.1		
DC – OH	28.7	**DC – OH**	28.7		
Total Hydr power	1768	**Total Hydr power**	1855		

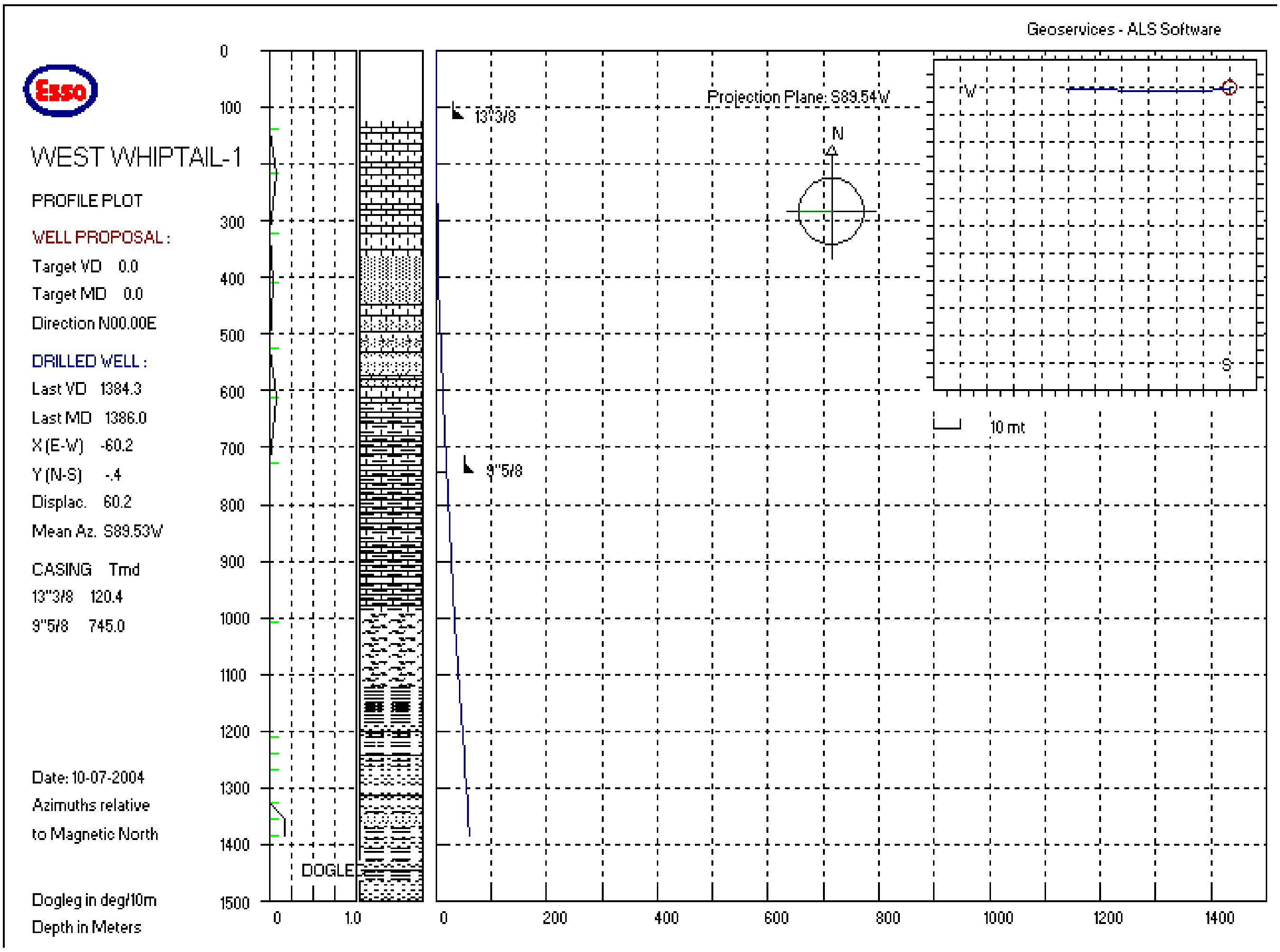
CASING DATA

Type	**Size** (Inches)	**Weight** (lb/ft)	**Grade**	**Thread**	**Depth** (mMDRT)
Conductor	30	310	X-52	RL-4	120
Surface	9 5/8	47	L-80	LTC	745

CEMENTING DATA

Casing / Plug details	**Cement Type**	**Dry Cement Volume** (sx)	**Cement Additives**	**Mix Water** (bbls)	**Slurry Volume** (bbls)	**Slurry Density** (ppg)	**Cement to/from** (mMDRT)	**Casing Pressure Test** (psi)
30"x20"x 13 3/8"	CLASS G	1084	1% CaCl 0.3 gal/bbl NF-6	130	220	15.9	121 m Seafloor (78 m)	1408 psi
9 5/8"	CLASS G (lead) CLASS G (tail)	415(lead) 323(tail)	Econolite 14.6gal / 10bbl (lead) Neat Seawater (tail)	130 (lead) 40 (tail)	164 (lead) 68 (tail)	12.5 (lead) 15.8 (tail)	89 m 745 m	1900 psi
PLUGS 1a	La Class G	197	3 gal/10 bbl HR6L + 20 GAL/10BBL HAL 413	24	40.7	15.8	1365m – 1539m	Balanced plug
1b	Class G	208	3 gal/10 bbl HR6L + 20 GAL/10BBL HAL 413	25	43	15.8	1191 m– 1365 m	Balanced plug
1c	Class G	252	3 gal/10 bbl HR6L + 20 GAL/10BBL HAL 413	31	52.15	15.8	1017 – 1191	Balanced plug
1d	Class G	222	3 gal/10 bbl HR6L + 20 GAL/10BBL HAL 413	27	45.86	15.8	843 – 1017m	Balanced plug
1e	Class G	222	1% CaCl	25	42.6	15.9	669m – 843m	Tag cmt 675m
2	Class G	70	1% CaCl	8.5	14.6	15.9	110m - 170m	

WELL DIRECTIONAL PROFILE AND SURVEY DATA



TMD	TVD	DRIFT	BEARING	E-W	N-S	DOGLE G
140.0	140.0	0.21	236.92	0.2 W	0.1 S	0
216.7	216.7	0.73	264.77	0.8 W	0.3 S	0.07
322.6	322.6	1.12	265.47	2.5 W	0.4 S	0
409.8	409.8	1.37	264.38	4.4 W	0.6 S	0.03
526.0	525.9	2.92	262.43	8.7 W	1.1 S	0
613.1	612.9	2.48	270.68	12.8 W	1.4 S	0.07
729.4	729.0	3.25	271.35	18.6 W	1.3 S	0
1008.0	1007.2	3.50	271.00	35.0 W	0.9 S	0
1212.0	1210.7	4.00	271.00	48.4 W	0.7 S	0
1241.0	1239.6	4.00	271.00	50.4 W	0.7 S	0.01
1270.0	1268.6	4.00	271.00	52.4 W	0.6 S	0.01
1328.0	1326.4	4.00	271.00	56.5 W	0.6 S	0
1357.0	1355.4	3.50	271.00	58.3 W	0.5 S	0.17
1386.0	1384.3	4.00	271.00	60.2 W	0.5 S	0.17

WELL DIARY

14th May 2004	Nipple up BOPs, function test. Make up 12¼" BHA and run in hole, drill out shoe track, displace to mud and drill ahead in 12.25" hole.
15th May 2004	Continue to drill ahead in 12¼" hole from 161m to 687 m.
16th May 2004	Drill 12¼" hole from 687 m 750 m. Circulate hole clean rotating and reciprocating pipe. Displace hole with 400bbl of Hi Vis mud. Drop Gyro survey and pump 25bbl slug. Pull out of hole. Clear rig floor of excess equipment and clean mud from rig floor. Make up jetting tool and jet BOP stack. Rack back Jetting tool. Prepare rig floor to run $9^5/_8$" casing. Make up shoe track and run $9^5/_8$" casing.
17th May 2004	Continue to run in hole with $9^5/_8$" casing. Pick up casing hanger and landing joints and set casing hanger into wellhead. Install diverter and hold pre job meeting. Pick up and make up cement head and lines. Displace and circulate hole with seawater. Pump 163 bbl of lead slurry (12.5ppg) and 68 bbl of tail slurry (15.8ppg) as per program. Displace cement with 20 bbl from cement unit and then with 160 bbl from rig. Bump plug with 1500 psi and circulate casing with seawater. Pump 330 bbl of sugar water; make up tool and jet stack. Make up and lock in seal assembly and casing hanger. Rig up to perform BOP tests.
18th May 2004	Rig up to perform BOP tests. Test BOPs; lay down closing tools, jars and stabilisers. Hold pre job meeting. Pick up and make up 8½" BHA as running in hole. Drill out stage collar and continue to run in hole to tag cement at 720 m. Pressure test and drill cement to 740 m. Perform choke drill and pressure test Top Drive IBOP valves. Drill out cement and shoe track from 740 m to 745 m and clean out rat hole to 750 m. Drill 3 m of new formation to 753 m. Perform leak off test with 9.7ppg mud to 590psi EMW of 14.3ppg. Drill 8½" hole from 753 m to 875 m.
19th May 2004	Continue to drill 8½" hole with surveys from 875 m to 1406 m.
20th May 2004	Continue to drill 8½" hole with surveys from 1406 m to 1539 m. Circulate bottoms up and pull out of hole to shoe. Run back in hole and circulate hole clean. Pull out of hole, lay out 8½" BHA and rig up to run wireline logs. Run in hole with Schlumberger wireline.
21st May 2004	Continue to run in hole with Schlumberger wireline to 1480 m. Log up from 1480 m to 1380 m. Run in hole and tag at 1529 m. Log from 1529 m to 745 m. Log casing from 745 m to surface. Remove radioactive source and lay out logging tools. Make up Run #2 tools and run in hole and hang up at 1241 m. Pull out of hole and lay out tools. Make up wiper trip BHA and run in hole to shoe and fill pipe. Run in hole and hang up at 1240 m. Wash and ream from 1240 m to 1290 m; circulate hole clean. Run in hole to 1522 m and wash and ream to TD. Circulate hole clean; condition mud; flow check and pump slug. Pull out of hole to tight spot at 1267 m; ream through and circulate clean. Pull out of hole to shoe and flow check. Pull out of hole and rack back BHA. Clear floor and rig up Schlumberger.
22nd May 2004	Make up Run #2A tools and run in hole to 1345 m. Log from 1345 m to 1475 m. Pull out of hole and lay out tools. Make up Run #3 tools and run in hole. Hang up at 1271 m. Log up to 100 m; survey every 50 m. Pull out of hole and lay out tools. Rig down wire line and clear floor. Pick up and run $2^7/_8$" tubing and mule shoe to 243 m.
23rd May 2004	Run in hole from 243 m to 1539 m; wash last stand to bottom. Circulate and condition mud. Pump and displace plug 1a. Pull out of hole to 1365 m and pump and displace plug 1b. Pull out of hole to 1191 m and reverse circulate. Pull back to 1170 m and circulate hole clean. Run in hole to 1191 m and pump and displace plug 1c. Pull out of hole to 1017 m and pump and displace plug 1d. Pull out of hole to 843 m and reverse circulate. Pull back to 825 m and circulate hole clean. Run in hole to 843 m and pump and displace plug 1e. Pull out of hole to 600 m and reverse circulate. Pull back to 550 m and circulate hole clean and displace to inhibited mud. Pull out of hole to 520 m and WOC.

24th May 2004

Continue to WOC. Run in hole and tag cement at 675 m. Pull out of hole and lay out tubing. Make up, run and set EZSV at 170 m. Pump and displace cement plug. Pull back to 100 m and displace casing to seawater. Pull out of hole with setting tool. Flush diverter lines and BOPs. Test cement to 1000 psi against blind rams. Attempt to retrieve seal assembly, jet BOP and retry to retrieve seal assembly. Lay out excess DP, run in hole and tag cement at 117 m. Nipple down BOPs and lines, while laying out DP.

25th May 2004

Lift BOPs; hoist gearbox failure stops operations. Lay down BOPs. Lay out 5" DP. Make up $9^5/_8$" mill / jetting tool assembly and jet seal assembly. Retrieve $9^5/_8$" seal assembly. Make up and run $9^5/_8$" casing cutter. Make casing cut at 87 m. Pull and lay out $9^5/_8$" casing. Make up and run in hole with hanger running tool. Attempt to engage hanger. Pull out of hole and make up $9^5/_8$" mill / jetting assembly.

Section 2
Geological Summary

FORMATION TOPS

DESCRIPTION	MD (m) RT	TVD (m) RT	TVD (m) SS
Top Gippsland Limestone	78.6	78.6	39.6
Lakes Entrance	815	814.5	775.5
Latrobe Group (TOL)	1179	1178.5	1139.5
Top Coarse Clastics	1183	1182.5	1143.5
Top N1.0	1403	1401.5	1362.5
Top N1.1	1406	1404.5	1365.5
Base N1.4	1430	1428.5	1389.5
Total Depth	1539	1539	1500

GEOLOGICAL SUMMARY

GIPPSLAND LIMESTONE

120 m - 815 m — CALCARENITE and CALCISILTITE with minor SANDSTONE

CALCARENITE — Off white to light grey locally pale grey, light grey brown in parts, very fine to coarse, predominantly fine, moderately well sorted, sub angular to sub rounded, abundant calcareous cement and matrix, trace to common microfossil fragments, trace glauconite, moderately hard, tight visual porosity, trace mineral fluorescence.

CALCISILTITE — Pale grey mottled white to off white, grading to MARL in part blocky in part, firm, occasional fossil fragments, trace glauconite, argillaceous.

SANDSTONE — Clear to translucent, medium dark yellowish orange staining, very fine to coarse, predominantly fine to medium, poorly sorted, moderately weak calcareous and siliceous cement, loose, very good inferred porosity, no fluorescence.

LAKES ENTRANCE FORMATION

815 m – 1179 m — CALCILUTITE grading to MARL with depth and minor SILTSTONE.

CALCILUTITE — Medium grey, firm to friable, sub-blocky to blocky, argillaceous, silty in part, trace disseminated pyrite, trace glauconitic, CALCILUTITE grading to ARGILLACEOUS CALCILUTITE.

MARL — light to medium grey, very pale green grey, very soft to rare firm, sub-blocky, silty in part, trace foraminifera, trace nodular glauconitic.

SILTSTONE — Brown grey, very soft to soft, argillaceous, calcareous to very calcareous, rare very fine disseminated pyrite, very glauconitic in part.

TOP of LATROBE GROUP

1179 m – 1185 m — SILTSTONE

SILTSTONE — brown grey to dark brown, very soft to soft, sub-blocky, argillaceous, very calcareous, trace carbonaceous speaks, rare disseminated & nodular pyrite, very glauconitic in part.

TOP of COARSE CLASTICS

1185 m - 1406 m	SANDSTONE with minor SILTSTONE and rare COAL
SANDSTONE	Clear to off white, fine to very coarse, predominantly medium to very coarse, poorly sorted to moderately sorted with depth, sub rounded to sub-angular, weak siliceous cement, trace pyrite cement, abundant quartz overgrowths, trace white silty matrix, friable, good inferred porosity.
FLUORESCENCE	1205 m to 1220 m; 5% decreasing to trace, moderately brittle, yellow, patchy to solid fluorescence, slow diffuse to instant yellow crush cut, thin ring residual.
FLUORESCENCE	1260 m to 1270 m; 5% decreasing to trace, dull, solid, yellow fluorescence, slow crush cut, thin yellow white film residual.
SILTSTONE	1) Pale to medium brown, argillaceous, common carbonaceous, lithics and glauconitic fragments, firm to mod hard, sub-blocky.
	2) Very pale green to grey, arenaceous good to very fine SANDSTONE, common lithics fragments, moderately hard, sub-blocky.
COAL	Black, dull, grading to carbonaceous SILTSTONE, brittle, blocky.

N1.0

1406 m - 1409.5 m	Interbedded SANDSTONE and SILTSTONE.
SANDSTONE	Clear to translucent, loose, fine to very coarse, predominantly coarse to very coarse, poorly sorted, sub-rounded to sub-angular, occasional angular fractured grains, clean, trace white argillaceous matrix, good inferred porosity, no fluorescence.
SILTSTONE	1) Light to medium brown, occasional brown black, soft to firm, sub-blocky to fissile, argillaceous to occasional arenaceous, common carbonaceous material and carbonaceous laminae.
	2) Trace – very pale green grey, firm, sub-blocky, argillaceous, very calcareous.

N1.1 and N1.2

1409.5 - 1414.5 m	Interbedded SANDSTONE and SILTSTONE.
SANDSTONE	Clear to translucent, loose, fine to coarse, rarely very coarse, moderately sorted, sub rounded to angular, clean, trace siliceous and pyritic cement, good inferred porosity.
FLUORESCENCE	dull yellow pinpoint, no direct cut, trace very slow crush cut, trace white residue ring.
SILTSTONE	Light to medium brown, occasionally brown / black, soft to firm, sub blocky to fissile, argillaceous to occasionally arenaceous, common carbonaceous material and carbonaceous laminae.

Base of N1.2

1414.5 m - 1418 m	Interbedded SANDSTONE, SILTSTONE and COAL
SANDSTONE	Clear - translucent, loose, fine - very coarse, predominantly coarse - very coarse, poorly sorted, sub rounded - sub angular, occasional angular fractured grains, clean, trace white argillaceous matrix, good inferred porosity.
SILTSTONE	(1) Light to medium brown, occasionally brown / black, soft to firm, sub blocky to fissile, argillaceous to occasionally arenaceous, common carbonaceous material and carbonaceous laminae.
	(2) Trace - very pale green/grey, firm, sub blocky, argillaceous, very calcareous.

COAL Black, dull - vitreous, firm, brittle, uneven - sub conchoidal fracture, slightly silty in part.

N1.3 and N1.4

1418 m - 1432 m

SANDSTONE Clear - translucent, loose, coarse - very coarse, predominantly, poorly sorted, sub rounded - sub angular, occasional angular fractured grains, clean, trace weak siliceous cement, good inferred porosity.

SILTSTONE Brownish grey - brownish black, firm, blocky - fissile, brittle in part, micro micaceous, very carbonaceous, common carbonaceous laminae and gradating to CARBONACEOUS SILTSTONE.

COAL Black, dull - vitreous, firm, brittle, uneven - sub conchoidal fracture, slightly silty in part.

BaseN1.4

1432 m - 1539 m

SANDSTONE: Clear to translucent, loose, medium to very coarse, common coarse to very coarse, sub-angular to sub-rounded, occasional very angular and fractured, poor sorted, clean, trace off white argillaceous matrix, good inferred porosity, no fluorescence.

SILTSTONE (1) Light brown grey, occasional light brown, very argillaceous, occasional carbonaceous speaks and laminations, very soft, dispersive in part, amorphous.
(2) Trace – green grey, argillaceous, calcareous, occasional glauconitic, firm, sub-blocky to blocky.

1539 m **TD**

GAS REPORT

No gas was recorded on drilling out of the $13^{3}/_{8}$" Conductor shoe at 120 mMDRT and not until 270 mMDRT first gas was recorded, which then remained steady at around 0.5 units until reaching the Surface Casing depth at 750 mMDRT. A compositional breakdown of this gas showed that it was solely Methane (C1). Upon drilling out of the $9^{5}/_{8}$" Casing Shoe gas levels rose to around 2 units but dropped on approach to the Top of the Lakes entrance at 815 mMDRT. A visual inspection revealed debris wrapped around the gas trap, but once cleared gas levels gradually rose through out the Lakes entrance until peaking at around 35 units at 1150 mMDRT prior to drilling into the Top of the Latrobe Group. Through the Base of the Lakes Entrance formation the first of the heavier gases C2 and C3 were recorded, with C4 and C5 seen immediately above the Latrobe Group top.

Through the Top of the Latrobe Group however after the gas peaked at 1192 mMDRT at around 25 units, gas levels dropped off to below 5 units where they remained through out the coarse Clastics with the heavier gases dropping off until primarily C1 and C2 were present. The highest peaks throughout this section were due to either the presence of interbedded Coals, connection gases or primarily because of the inpermeability of the overlying cap rock to hydrocarbons. The Fluorescence that was seen within this section occurred with gas peaks of between 15 to 20 units.

Gas levels increased again at the base of the coarse Clastics and remained between 15 and 30 units upon drilling into the N1.0, N1.1 and N1.2 package. Fluorescence was present between 1410 mMDRT to 1414.5 mMDRT. Through the Base N1.2, N1.3 N1.4 sands Gas levels dropped back to around 5 units right through to TD at 1539 m peak at 1432 m once through the N1.4 sand of around 21 units.

Localised increases in background gas are attributed to both lithology variations and the penetration rate. The presence of connection gas signified that drilling pressures were on balance. No CO2 or H2S was detected while drilling West Whiptail 1 well.

GAS PEAKS THROUGH THE LATROBE GROUP

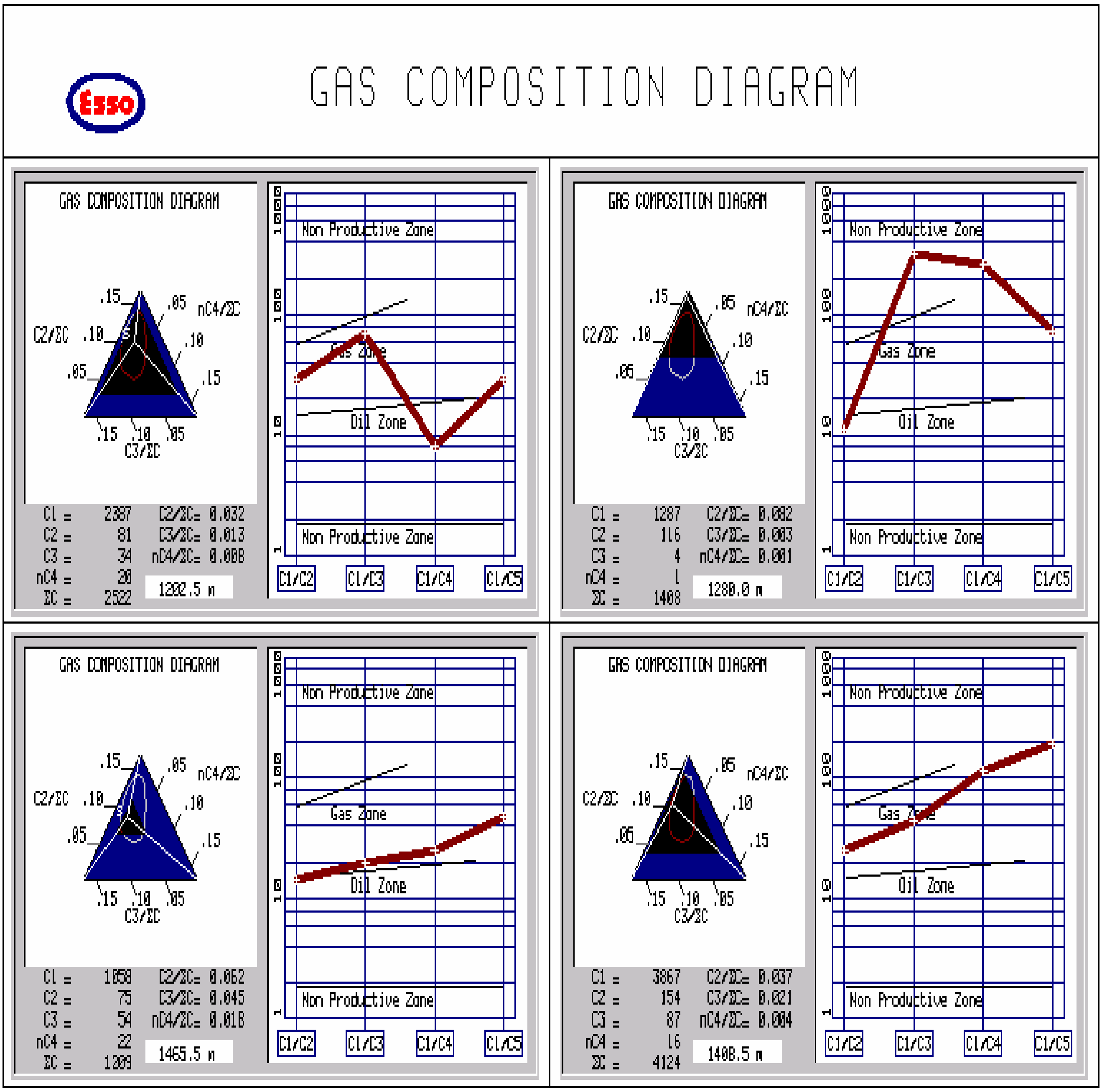
Depth metres	Total Gas units	C1 ppm	C2 ppm	C3 ppm	iC4 ppm	nC4 ppm	iC5 ppm	nC5 ppm
1191.5	24.7	3792	97	20	10	17	8	0
1202.5	23.3	2387	81	34	277	20	81	1
1245.5	18.2	2328	310	11	13	2	7	0
1261.0	20.7	2707	364	8	9	1	5	1
1280.0	10.4	1287	116	4	4	1	17	1
1314.5	10.0	1286	119	5	3	1	9	0
1324	8	1002	76	5	3	1	8	1
1348.5	7	840	56	6	5	1	7	0
1405.5	30.0	3830	149	111	12	7	4	1
1408.5	31.6	3867	154	87	18	16	12	8
1415.0	28.5	3399	310	59	15	11	12	6
1434.0	20.9	2221	157	82	31	24	12	6
1465.5	12.3	1058	75	54	20	22	16	6
1515.5	7.5	567	38	34	16	19	11	6

FLUORESCENCE AND ASSOCIATED GAS

Depth Metres	Total Gas units	C1 ppm	C2 ppm	C3 ppm	iC4 ppm	nC4 ppm	iC5 ppm	nC5 ppm
1205 – 1220								
1205	15	1330	50	20	155	14	39	2
1212	8	642	26	12	60	9	20	1
1220	5	315	14	6	32	5	14	1
1260 – 1270								
1261	21	2396	325	7	8	1	5	1
1269	6	630	75	3	5	1	17	1
1410 - 1415								
1410	20	2156	88	60	17	12	15	7
1415	29	3399	310	59	15	11	12	6

MDT SUMMARY

Point No.	Depth M	TVD M	Drawdown Mobility MD/CP	Mud Pressure Before PSIA	Mud Pressure After PSIA	Formation Pressure PSIA	Test Type
1	1364.0	1322.5	15860.0	2434.36	2434.21	1867.84	20cc drawdown
2	1373.0	1331.5	118.6	2450.29	2450.05	1880.38	20cc drawdown
3	1390.0	1348.5	14665.0	2480.09	2480.02	1903.99	20cc drawdown
4	1398.4	1356.9	767.2	2494.99	2494.87	1915.67	20cc drawdown
5	1407.0	1365.5		2510.20			Retrace
6	1406.5	1365.0		2509.28			5cc drawdown
7	1407.5	1366.0		2511.04			Press Ltd drawdown
8	1410.5	1369.0	2362.2	2516.19	2516.13	1936.18	10cc drawdown
9	1412.5	1371.0	193.2	2519.70	2519.61	1938.40	20cc drawdown
10	1414.0	1372.5	4.1	2522.38	2522.15	1940.13	20cc drawdown
11	1420.5	1379.0	252.7	2533.72	2533.62	1946.78	20cc drawdown
12	1425.0	1383.5	3803.0	2541.62	2541.55	1953.00	20cc drawdown
13	1430.5	1389.0	2084.0	2551.27	2551.24	1960.67	20cc drawdown
14	1440.0	1398.5	506.0	2568.18	2568.16	1976.03	20cc drawdown
15	1461.0	1419.5	3363.0	2605.40	2605.27	2006.43	20cc drawdown
16	1470.0	1428.5	4115.0	2621.50	2621.37	2019.67	20cc drawdown
17	1412.5	1371.0		2519.31	2519.32	1938.47	Diverted flow
18	1418.5	1377.0		2529.22	2529.28		10cc drawdown
19	1419.0	1377.5	116.0	2580.08	2530.06	1945.19	Diverted flow
20	1413.8	1372.3	1.3	2520.76	2520.74	1940.99	20cc drawdown
21	1413.5	1372.0	71.4	2520.19	2520.54	1939.82	20cc drawdown


GAS COMPOSITION DIAGRAM
GAS COMPOSITION DIAGRAM
C2/ΣC
nC4/ΣC
C3/ΣC
.15 .10 .05
Non Productive Zone
Gas Zone
Oil Zone
C1/C2 C1/C3 C1/C4 C1/C5
C1 = 2387 C2/ΣC= 0.032
C2 = 81 C3/ΣC= 0.013
C3 = 34 nC4/ΣC= 0.008
nC4 = 20
ΣC = 2522
1202.5 m
C1 = 1287 C2/ΣC= 0.082
C2 = 116 C3/ΣC= 0.003
C3 = 4 nC4/ΣC= 0.001
nC4 = 1
ΣC = 1408
1280.0 m
C1 = 1058 C2/ΣC= 0.062
C2 = 75 C3/ΣC= 0.045
C3 = 54 nC4/ΣC= 0.018
nC4 = 22
ΣC = 1209
1465.5 m
C1 = 3867 C2/ΣC= 0.037
C2 = 154 C3/ΣC= 0.021
C3 = 87 nC4/ΣC= 0.004
nC4 = 16
ΣC = 4124
1408.5 m

APPENDIX 4

CHECKSHOT DATA

Schlumberger

ESSO Australia Pty Ltd

WEST WHIPTAIL-1

WELL SEISMIC PROCESSING REPORT

CHECKSHOT / GEOGRAM

FIELD:	Near Field Wildcat
COUNTRY:	Australia
COORDINATES:	Latitude: 38 19' 29.150" S
:	Longitude: 147 30' 17.167" E
Zone:	VIC / L1 AMG 55
DATE OF SURVEY:	22-May-2004
SURVEY TYPE:	Rig Source Checkshot, Offshore, Airgun
REFERENCE NO:	DS 1104-06

Prepared by: L. Dahlhaus

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Schlumberger

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List of Figures

Attachments

1 Introduction

A borehole seismic survey was recorded in one run in the near vertical (max 8 deg) offshore well West Whiptail-1 on 22 May 2004. This survey consisted of rig source checkshot measurements in both open and cased hole. The data were acquired using a single Combinable Seismic Acquisition Tool (CSAT-B) downhole and a Parallel Dual Air gun source deployed from a crane on the rig.

Processing of the data consisted of performing Checkshot processing, Sonic calibration and Synthetic seismogram generation. This report describes the processing techniques used, the parameters chosen and presents the results of the data processing. No surface seismic data was available for a quick-look well tie.

2 Data Acquisition

The data were acquired in one logging run (Run 3) in both open and cased hole, using a single three component Combinable Seismic Acquisition Tool (CSAT-B) fitted with GAC accelerometers.

Two 150 cu in G-Gun Airguns were used as the source operating under 2000 psi. The guns were suspended in sea 5m below a buoy at 24.1 m offset from the wellhead. Two reference hydrophones were positioned at 5 m below the guns. Recording was made on the Schlumberger Maxis 500 Unit using DLIS format.

The checkshot levels were acquired from 1265 m MD DF to 100 m MD DF at 50 m intervals. A minimum of 3 good shots was recorded for each level. The checkshots above 500 m MD DF are affected by casing arrivals but the formation first arrival could still be picked using the 3 component data.

Elevation of KB/DF/RT	39 m above MSL
Elevation of GL	39 m below MSL
Well Deviation	max 8 deg
Energy Source	2x 150 cu in Sodera G-Guns (Parallel Cl)
Reference Sensor	Hydrophone
Source & Hyd. Offset	24.1 m
Source & Hyd. Azimuth	88 deg
Source Depth	5 m below MSL
Hydrophone Depth	10 m below MSL
Water Velocity	1524 m/s
Tool	CSAT-B
Sensor Type	3-C GAC – Geophone Accelerometer
Sampling Rate	1 ms.

Table 1. Survey Parameters

3 Well Seismic Edit

The initial preparation of the data is called Well Seismic Edit and consists of:

- Load Data
- Edit bad records & Sort Data
- Pick Reference Break times
- Median stack
- Geophone Transform
- Pick Break time on Stacked Data

Each shot of the raw GAC data was evaluated and edited to remove bad traces. The hydrophone data were also evaluated for signature changes and timing shifts. The good shots at each level were stacked, using a median stacking technique, to increase the signal to noise ratio of the data. For better comparison with geophone data, a transform to a 10 Hz/76% damped geophone is applied to the GAC data. This transform from acceleration to velocity is in the field approximated by integrating raw data. After stacking and transform the transit time of each trace was re-computed. The following subsections describe the main aspects of the well seismic edit phase.

3.1 Data Quality

The data quality is generally good. The source signature is stable. No checkshots were excluded from processing after analysis of the 3 component data showed that reliable first breaks could be picked even in the shallower cased section of the well.

3.2 Transit Time Measurement

The measured transit time corresponds to the difference between arrivals recorded by surface and downhole sensors. The reference time (zero time) is the physical recording of the source signal by accelerometers on the gun or sensors positioned near the source. In this case, a hydrophone positioned 5 m below the gun was used as the reference. An inflection point tangent first break picking algorithm was used on both the hydrophone and the geophone data.

3.3 Stacking

After reordering and selecting the raw shots, a median stack was performed on the three component data. In this method of stacking, at each sample time, the amplitudes of the input traces are read and sorted in ascending order. The output is the median amplitude value from this ordering. If an even number of traces is input, the first is dropped and a median calculated. Then the last is dropped and another median found. The final output is the average of these two median values. The surface sensor (hydrophone) breaks are used as the zero time for stacking. The break time of each trace is recomputed after stacking. The X, Y and Z component stacks are presented in Figures 2 ,3 and 4.

3.4 Transit Time Correction to Datum

Seismic Reference Datum (SRD) is Mean Sea Level (MSL). Survey geometry and well deviation corrections and a static shift of 6.6 ms were applied to the data to correct to SRD. This correction to SRD was calculated using a surface velocity of 1524 m/s. No tidal corrections have been applied.

3.5 Composite Displays of Results

A snapshot of the 40 cm/s composite display (PLOT-1) of checkshot calibrated log and synthetic data is shown in figure 5.

Composite displays of the Synthetic Seismograms are also shown in Figures 6a / 6b and Figures 7a / 7b. The figures show the synthetics using both a Zero Phase and a Quad (-90 deg rotated) Phase wavelet in both normal and reverse polarity.

The standard polarity convention used (Normal: Increase in Acoustic Impedance is a Trough) is explained in Figure 9.

For the Quad Phase results Normal polarity means that the time pick is at the zero crossing of a Trough preceded by a Peak.

4 Sonic Calibration Processing

4.1 Sonic Calibration

A 'drift' curve is obtained using the sonic log and the vertical check level times. The term 'drift' is defined as the seismic time (from check shots) minus the sonic time (from integration of edited sonic). Commonly the word 'drift' is used to identify the above difference, or to identify the gradient of drift versus increasing depth, or to identify a difference of drift between two levels.

The gradient of drift, that is the slope of the drift curve, can be negative or positive.

For a negative drift (Δdrift/Δdepth < 0) the sonic time is greater than the seismic time over a certain section of the log.

For a positive drift (Δdrift/Δdepth > 0), the sonic time is less than the seismic time over a certain section of the log.

The drift curve, between two levels, is then an indication of the error on the integrated sonic or an indication of the amount of correction required on the sonic to have the TTI of the corrected sonic match the check shot times.

Two methods of correction to the sonic log are used.

1. Uniform or block shift. This method applies a uniform correction to all the sonic values over the interval. This uniform correction is applied in the case of positive drift and is the average correction represented by the drift curve gradient expressed in µsec/m .

2. ΔT Minimum. In the case of negative drift a second method is used, called Δ minimum. This applies a differential correction to the sonic log, where it is assumed that the greatest amount of transit time error is caused by the lower velocity sections of the log. Over a given interval the method will correct only Δt values which are higher than a threshold, the Δt_{min} . Values of Δwhich are lower than the threshold are not corrected. The correction is a reduction of the excess of Δt over Δt_{min}, $\Delta t - \Delta t_{min}$.

$\Delta t - \Delta t_{min}$ is reduced through multiplication by a reduction coefficient which remains constant over the interval. This reduction coefficient, named G, can be defined as:

$$G = 1 + \frac{drift}{(\Delta t - \Delta t_{min})dZ}$$

Where drift is the drift over the interval to be corrected and the value $(\Delta t - \Delta t_{min})dZ$ is the time difference between the integrals of the two curves Δt and Δt_{min}. only over the intervals where $\Delta t > \Delta t_{min}$.

Hence the corrected sonic: $\Delta t = G(\Delta t - \Delta t_{min}) + \Delta t_{min}$.

4.2 Open Hole Logs

The processed compressional DTCO curve from the DSI data was used for drift computation. The log quality is good.

The density log has been extended to the top of the sonic log using a constant value. Other logs included as companion curves are: Gamma Ray, Neutron Porosity, Resistivity and Caliper.

4.3 Correction to Datum and Velocity Modeling

The sonic calibration processing has been referenced to MSL, which is the seismic reference datum. Geometry corrections are applied to correct for well deviation, source offset, source depth and SRD elevation.

4.4 Sonic Calibration Results

The checkshot near the top of the sonic log (650 m MD DF) is chosen as the origin for the calibration drift curve. The compressional sonic log was extended using the checkshot data for the generation of the velocity and time/depth listings.

The drift curve is the correction imposed upon the sonic log. The adjusted sonic curve is considered to be the best result using the available data. A list of shifts used on the sonic data is given in A2 Listing (supplied in digital form on Final Results CD-ROM).

The drift curve here display a normal positive drift, which is the expected behavior due to sonic velocity dispersion and the absence of bad hole conditions.

The Velocity Cross plot is presented in Figure 8 and as a separate plot.

5 Synthetic Seismogram Processing

GEOGRAM plots were generated using 2x 3 different wavelets: 20 Hz, 30 Hz and 40 Hz (Dominant Frequency) Zero Phase and Quad Phase (-90 deg rotated) Ricker wavelets.

The presentation includes composite plots on a time scale of 40 cm/sec in both normal and reverse polarity (Plots 1 and 2). The full set of synthetic traces is displayed for the 30 Hz Ricker Synthetics.

GEOGRAM processing produces synthetic seismic traces based on reflection coefficients generated form sonic and density measurements in the wellbore. The steps in the processing chain are the following:

- Depth to time conversion
- Reflection coefficient generation
- Attenuation coefficient calculation
- Convolution
- Output

5.1 Depth to Time Conversion

Open hole logs are recorded from the bottom to top with a depth index. This data is converted to a two-way time index.

5.2 Primary Reflection Coefficients

Sonic and density data are averaged over chosen time intervals (normally 2 ms). Reflection coefficients are then computed using:

$$R = \frac{r_2.v_2 - r_1.v_1}{r_2.v_2 + r_1.v_1}$$

where:

r_1 = density of the layer above the reflection interface
r_2 = density of the layer below the reflection interface
v_1 = compressional wave velocity of the layer above the reflection interface
v_2 = compressional wave velocity of the layer below the reflection interface

This computation is done for each time interval to generate a set of primary reflection coefficients without transmission losses.

5.3 Primaries with Transmission Losses

Transmission loss on two-way attenuation coefficients is computed using:

$$A_n = (1 - R_1^2).(1 - R_2^2).(1 - R_3^2)...(1 - R_n^2)$$

A set of primary reflection coefficients with transmission loss is generated using:

$$Primary_n = R_n.A_{n-1}$$

5.4 Primaries plus Multiples

Multiples are computed from these input reflection coefficients using the transform technique from the top of the well to obtain the impulse response of the earth. The transform outputs primaries plus multiples.

5.5 Multiples Only

By subtracting previously calculated primaries form the above result we obtain multiples only.

5.6 Wavelet

A theoretical wavelet is chosen to use for convolution with the reflection coefficients previously generated. Choices available include:

Klauder wavelet
Ricker zero phase wavelet
Ricker minimum phase wavelet
Butterworth wavelet
User defined wavelet

Time variant Butterworth filtering can be applied after convolution.

5.7 Polarity Convention

An increase in acoustic impedance gives a positive reflection coefficient, is written to tape as a negative number and is displayed as a white trough under normal polarity. Polarity conventions are displayed in Figure 9.

5.8 Convolution

The standard procedure of convolving the wavelet with reflection coefficients; the output is the synthetic seismogram.

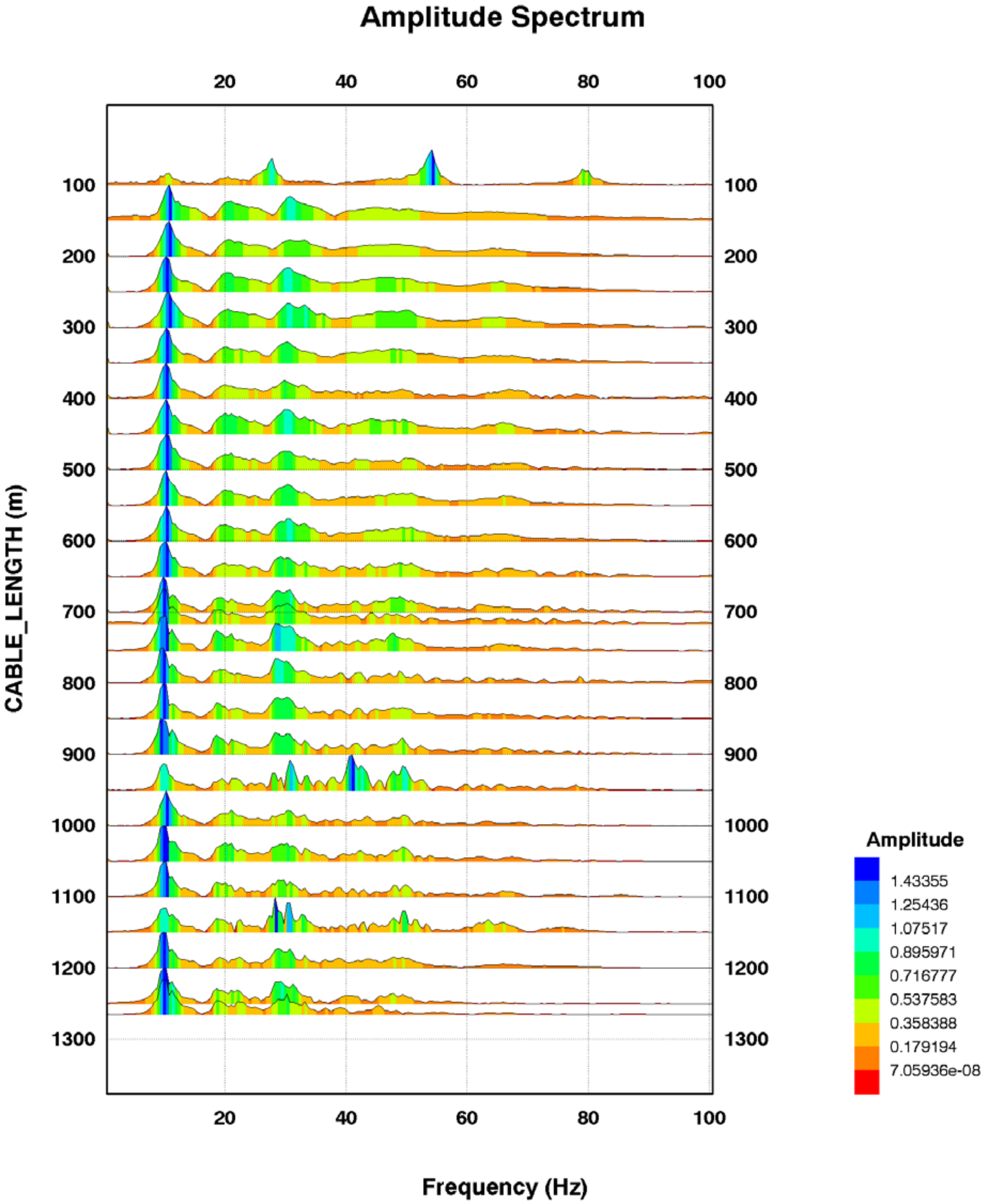

Figure 1. Amplitude Spectrum

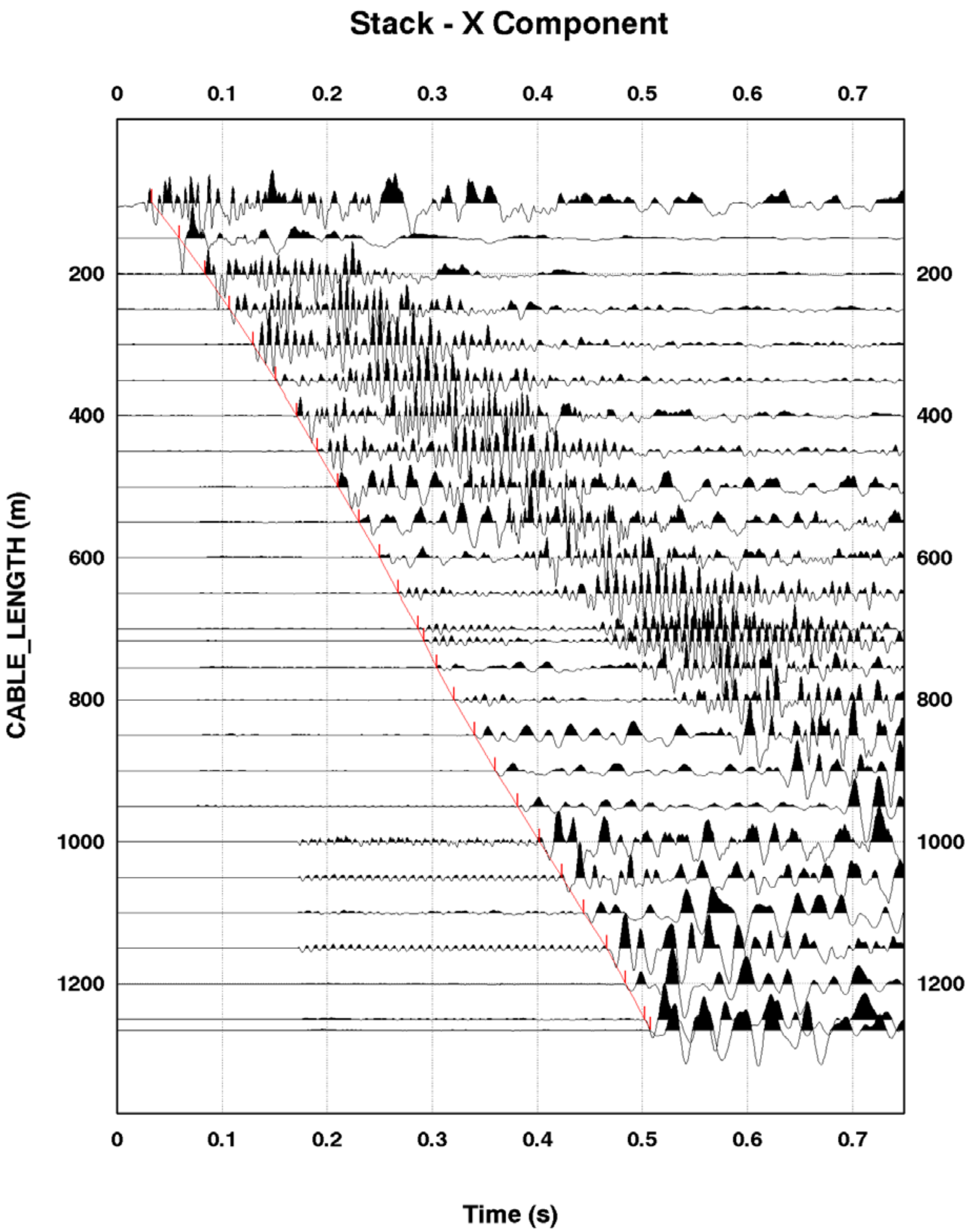

Figure 2. X Component Stack

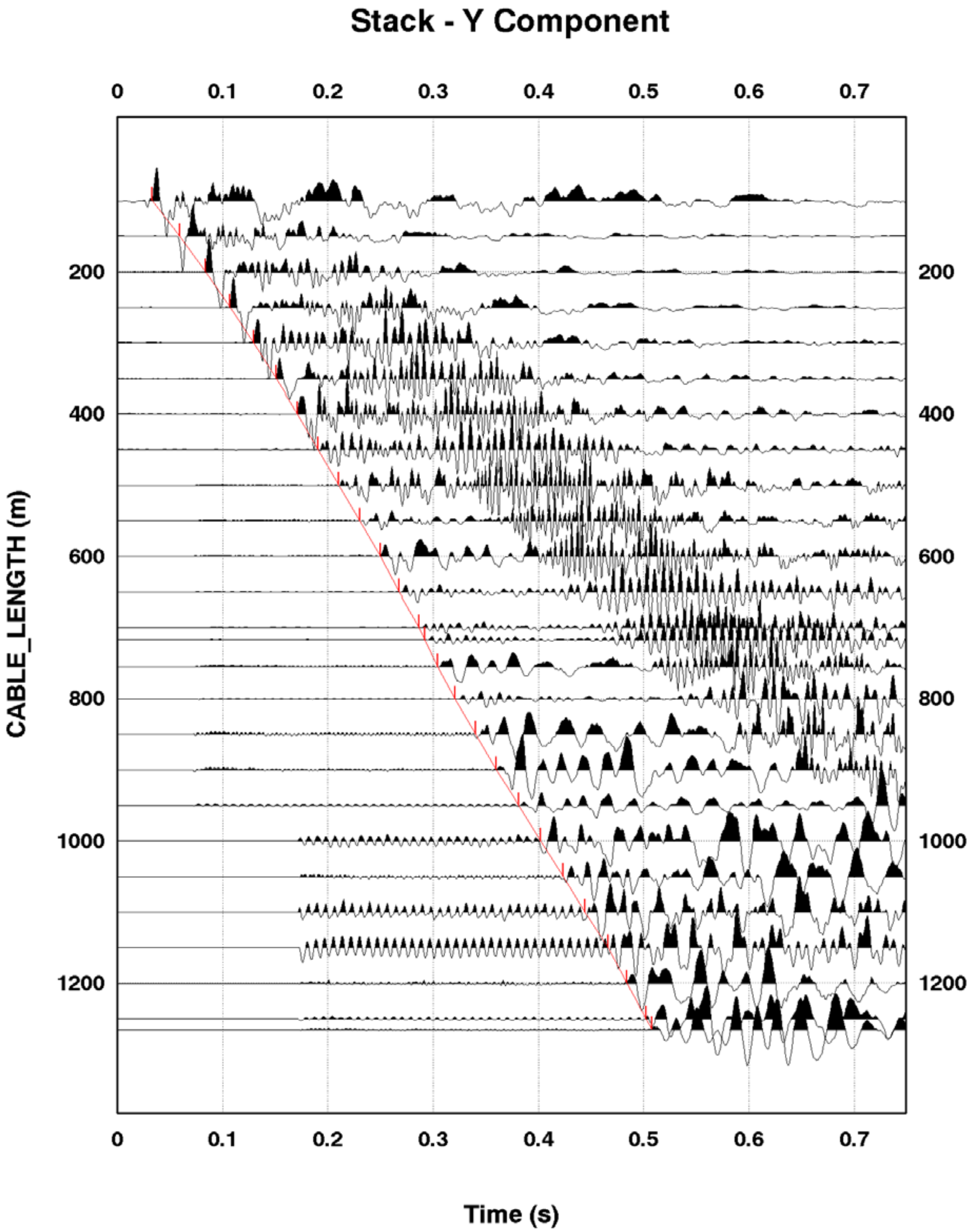

Figure 3. Y Component Stack

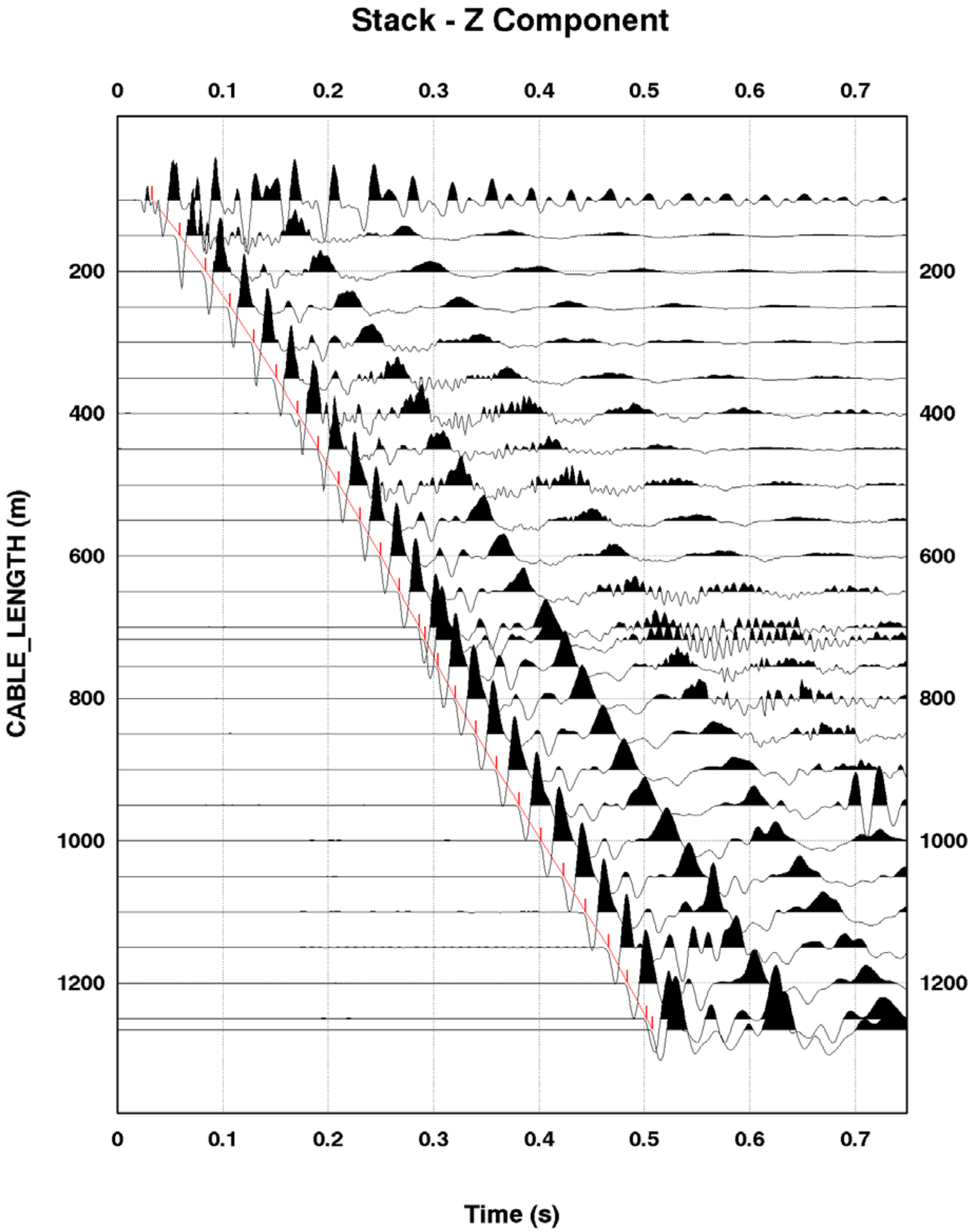

Figure 4. Z Component Stack

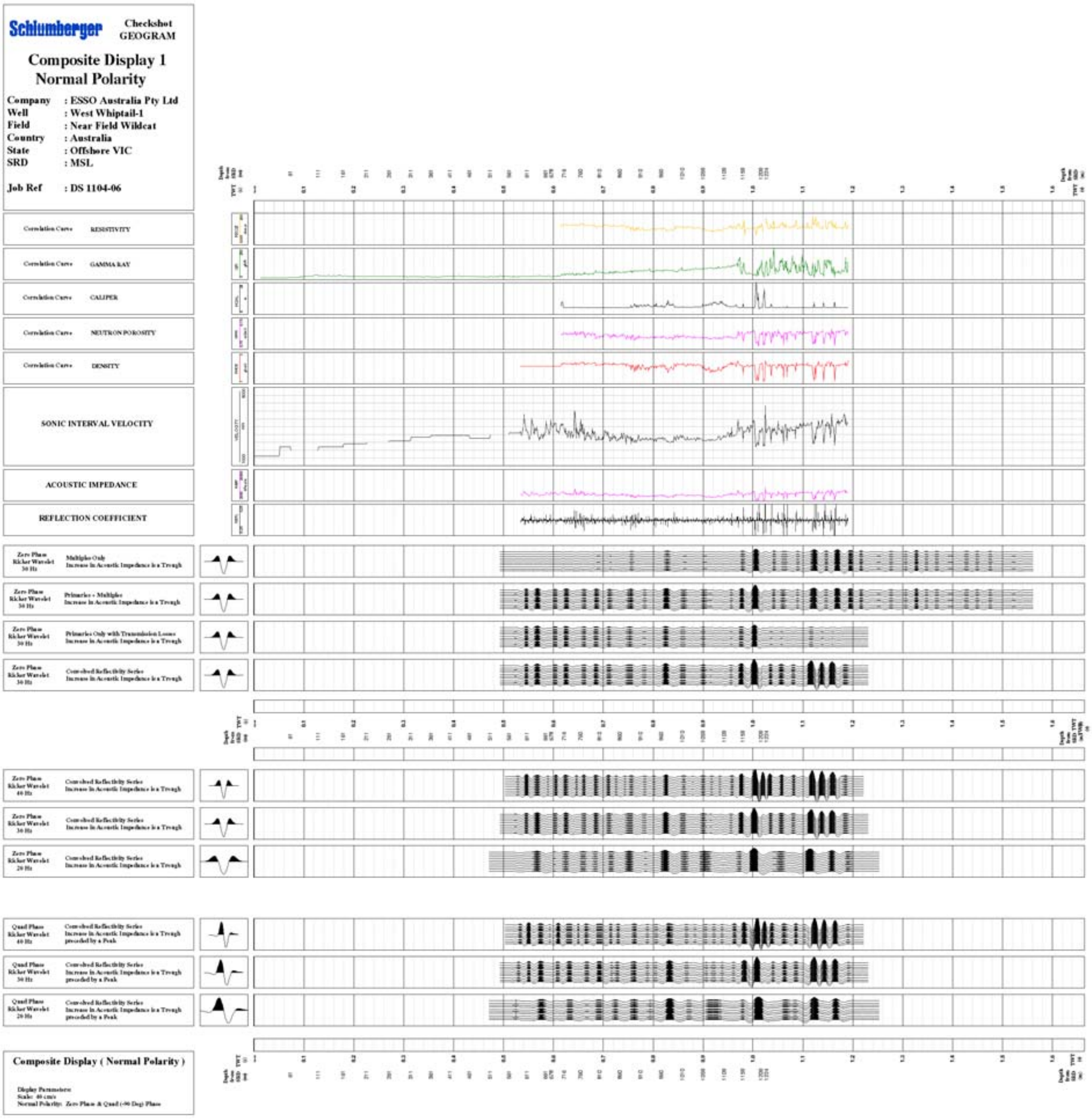

Figure 5. Composite Display (See Plot 1)

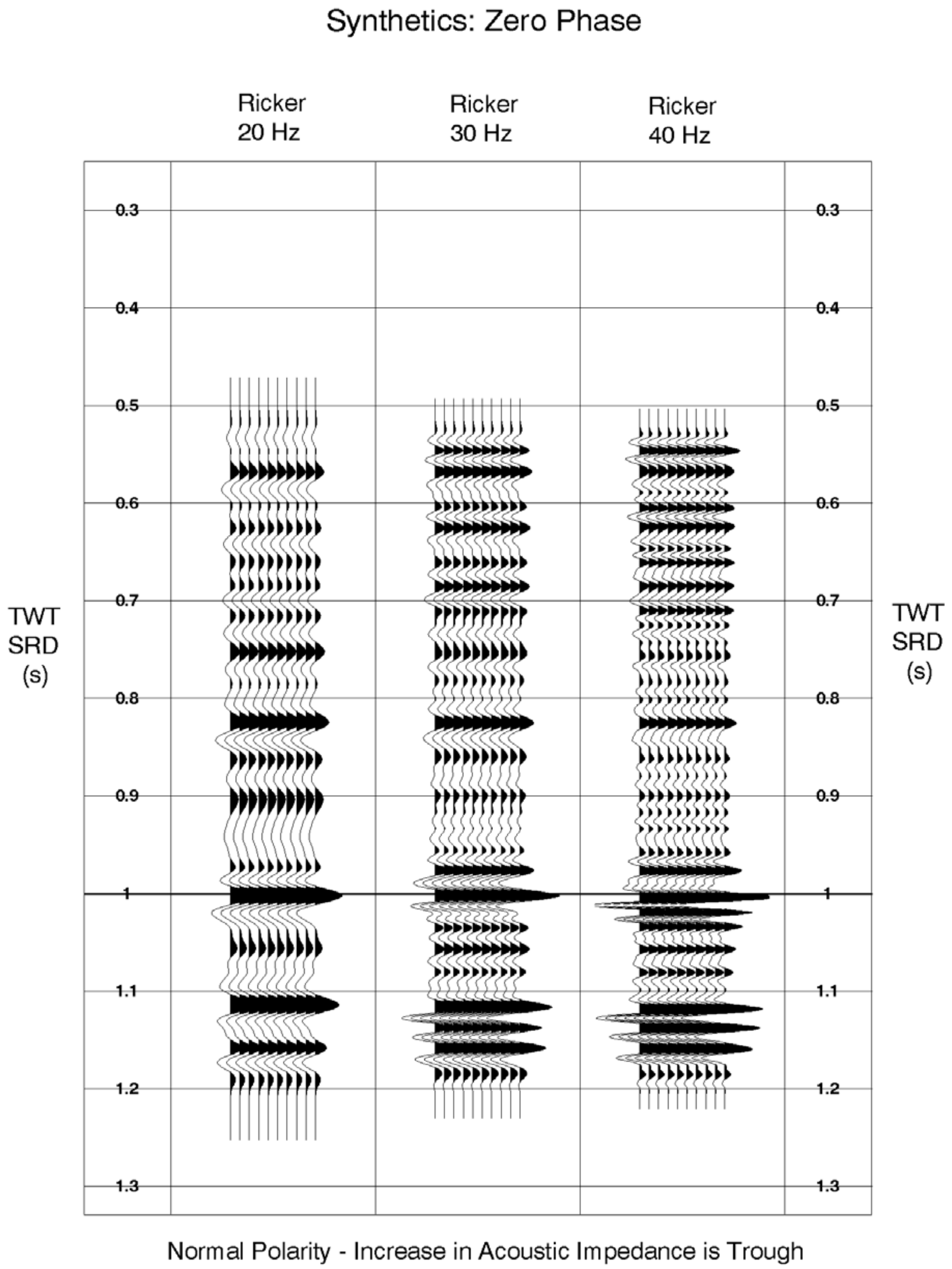

Figure 6a. Composite Display of Zero Phase Ricker Synthetics (N)

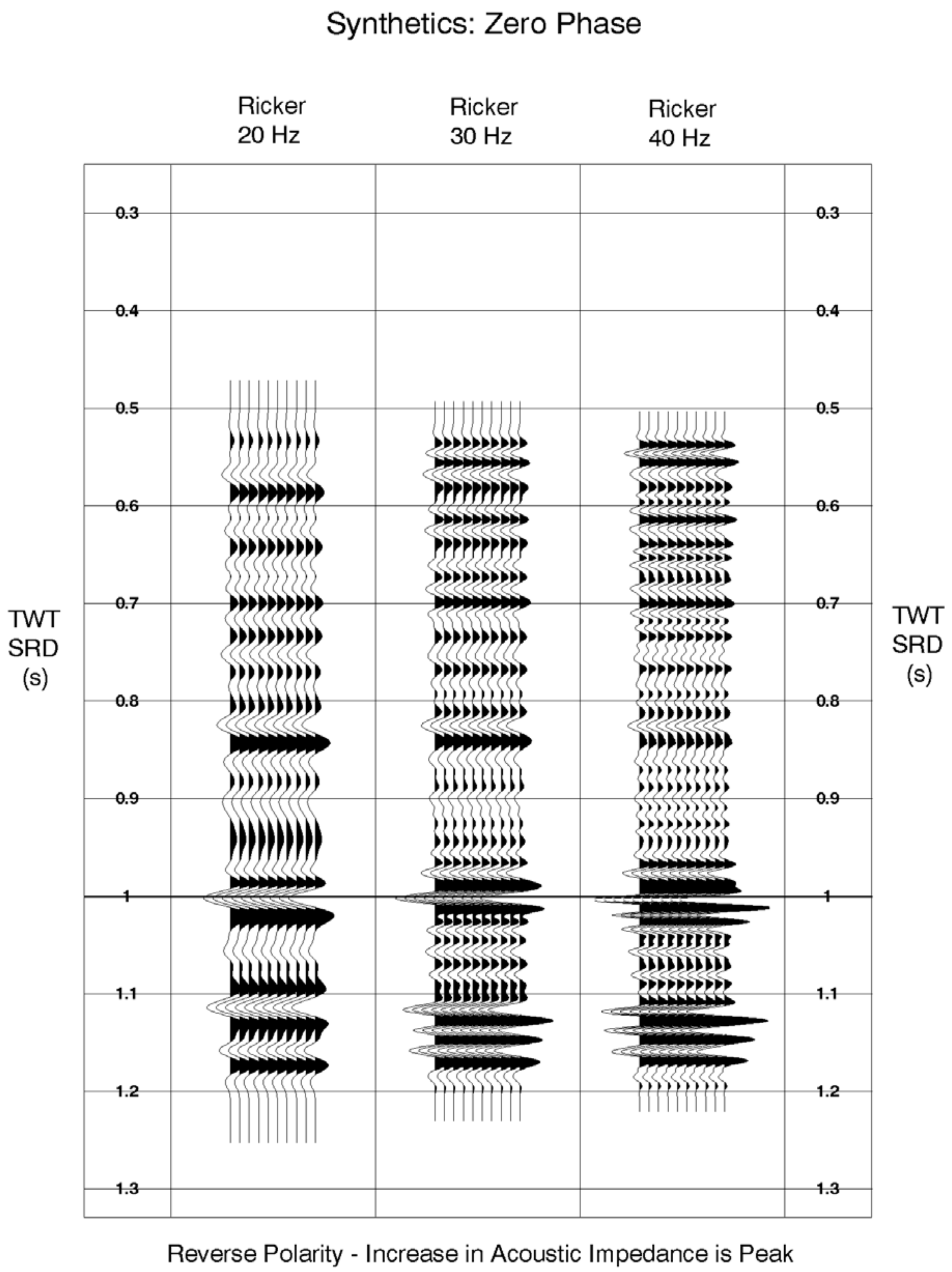

Figure 6b. Composite Display of Zero Phase Ricker Synthetics (R)

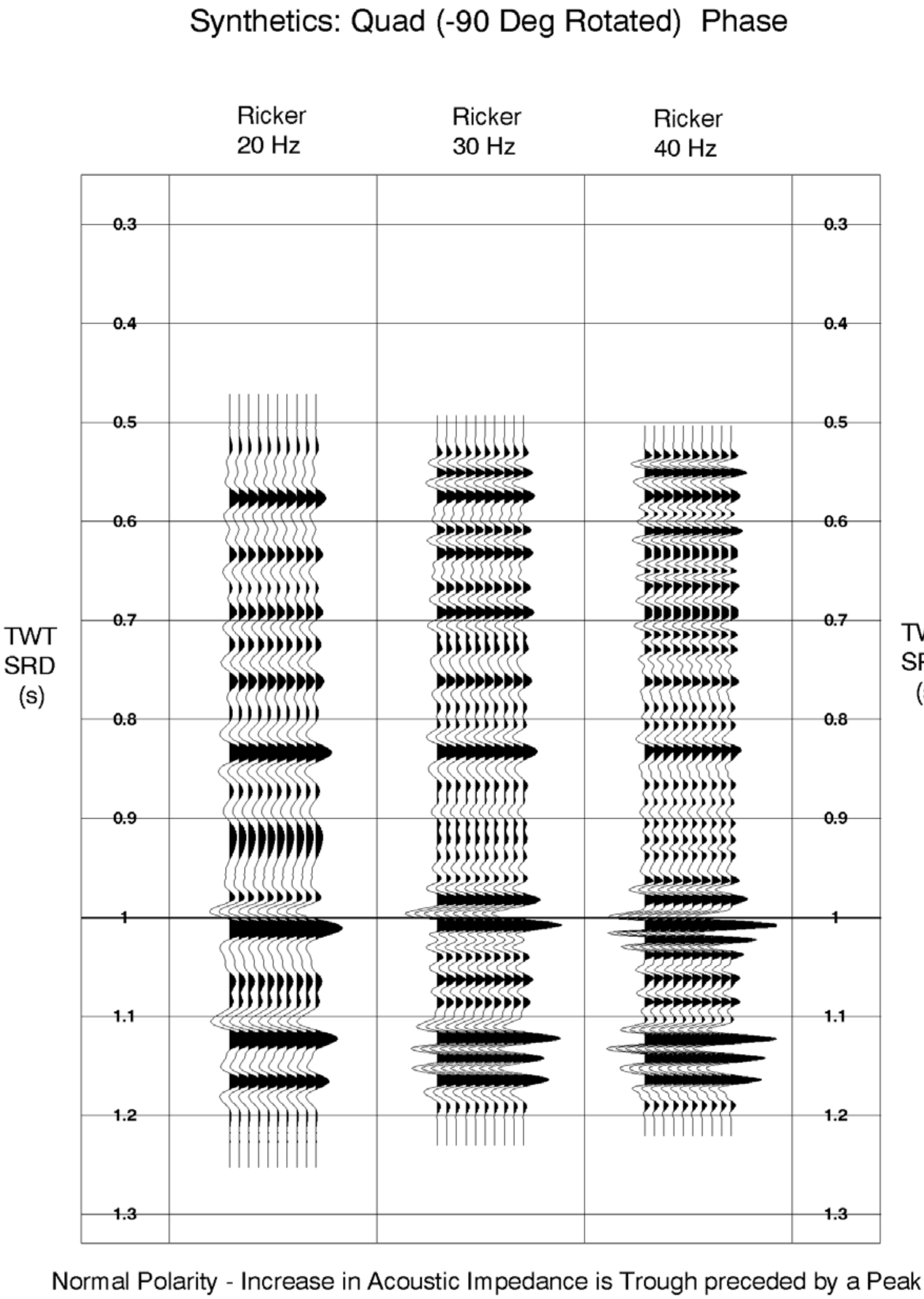

Figure 7a. Composite Display of Quad Phase Ricker Synthetics (N)

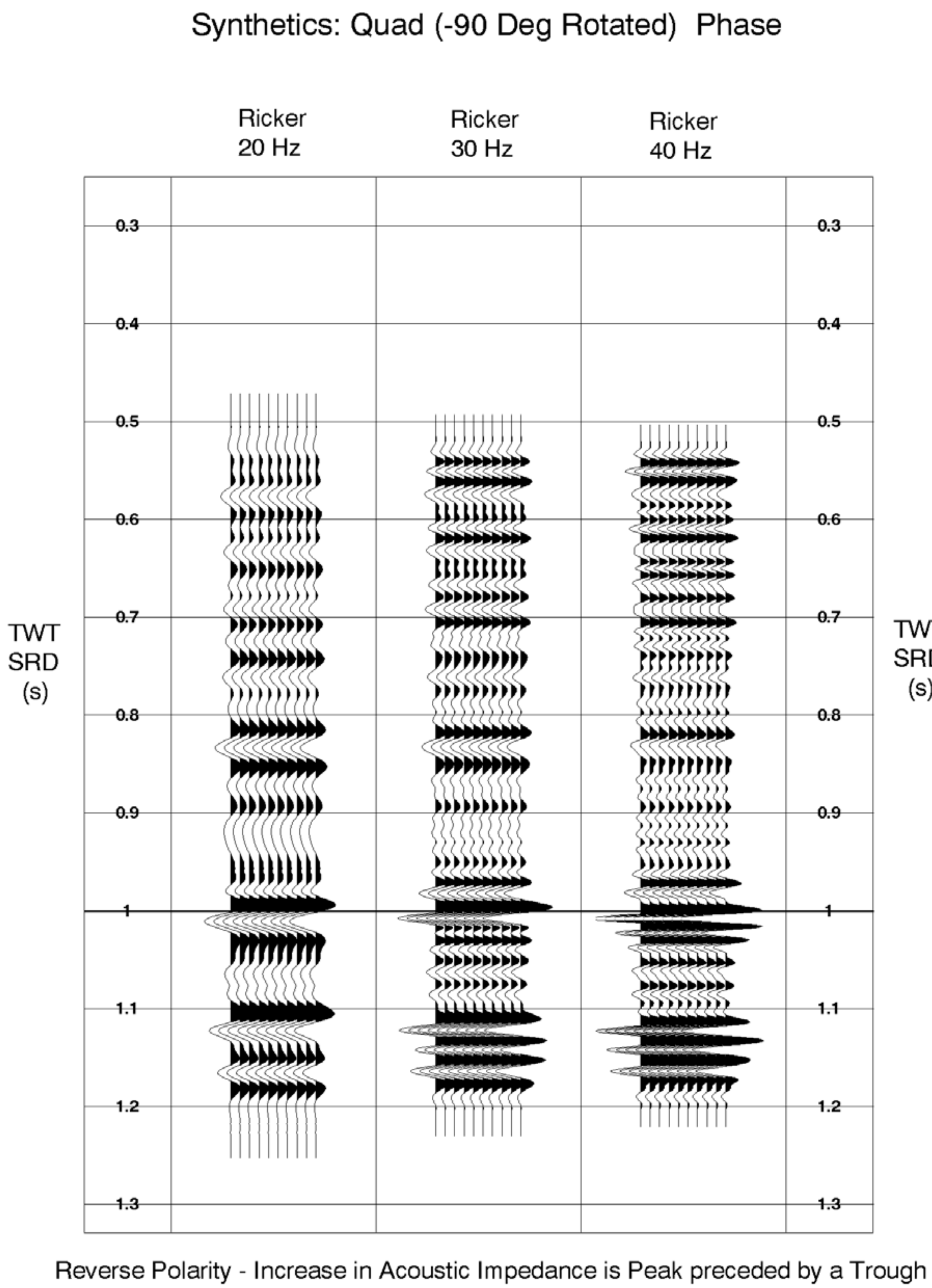

Figure 7b. Composite Display of Quad Phase Ricker Synthetics (R)

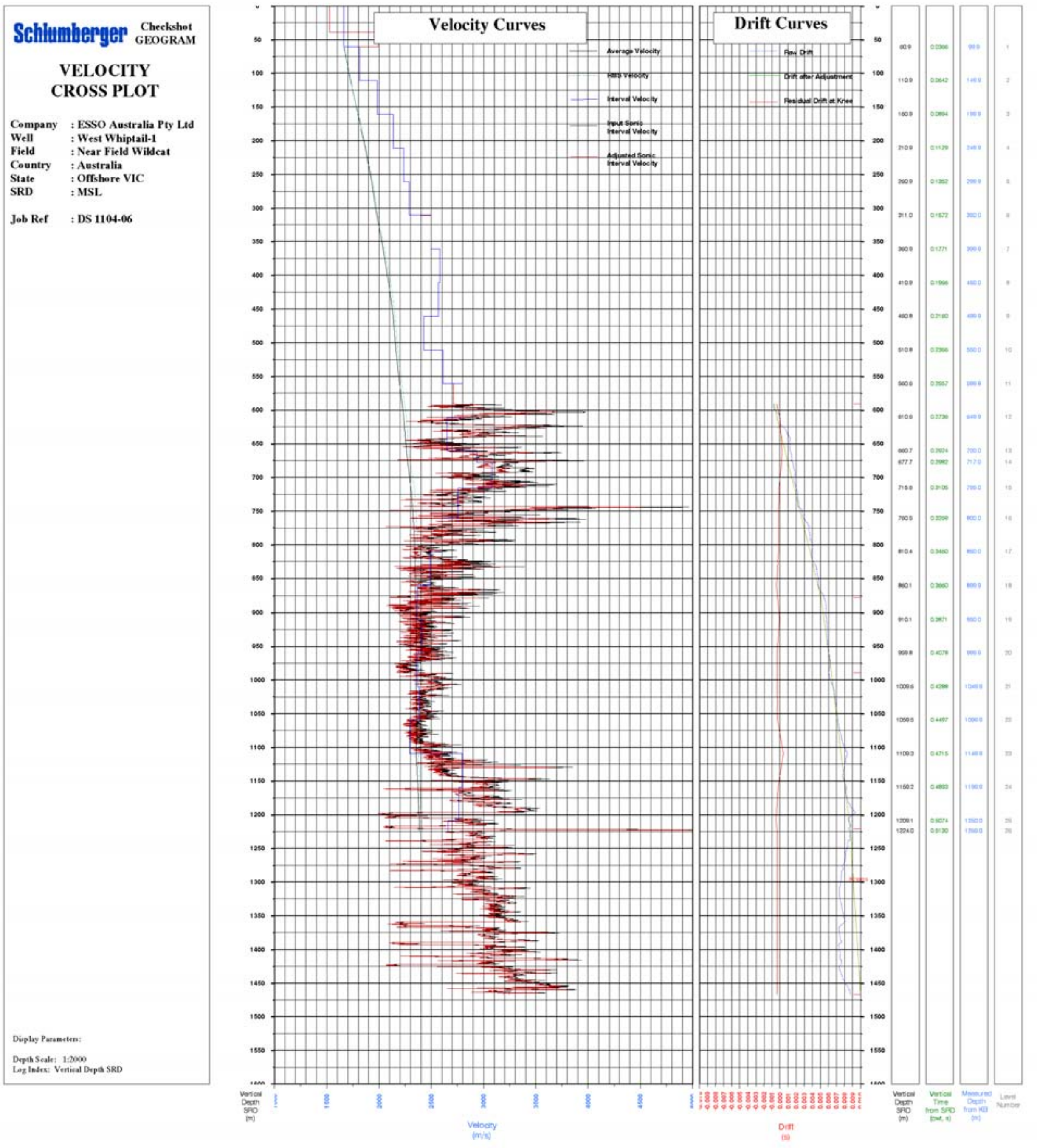

Figure 8. Velocity Cross plot (see Plot 3)

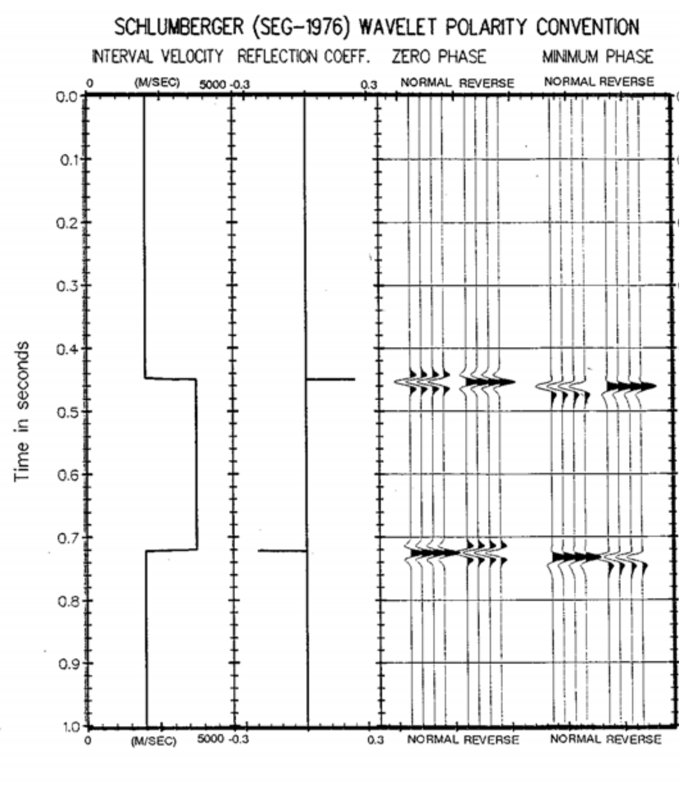

Figure 9. Schlumberger Wavelet Polarity Convention

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Attachment 1: Summary of Geophysical Listings

Four geophysical data listings are appended to this report. A1 is included in the report, A2, A3 and A4 are provided in electronic form on the CD-ROM. Following is a brief description of the format.

A1 Check Shot Data

1. Level number: the level number starting from the top level (includes any imposed shots).

2. Vertical depth form MSL: *dsrd*, the depth in meters from seismic reference datum.

3. Measured depth from DF: *dkb*, the depth in meters from DF.

4. Observed travel time HYD to GEO: *tim*0, the transit time picked form the stacked data by subtracting the surface sensor first break time from the downhole sensor first break time.

5. Vertical travel time MSL to GEO: *shtm*, is *timv* – vertical time, corrected for the vertical distance between source and datum.

6. Delta depth between shots: Δ*depth*, the vertical distance between each level.

7. Delta time between shots: Δ*time*, difference in vertical travel time (*shtm*) between each level.

8. Interval velocity between shots: average velocity between each level, Δ*depth*/Δ*time*

9. Average velocity MSL to GEO: average velocity from datum to the checkshot level, shtm/dsrd

A2 Drift & Sonic Adjustment

Zone Set Data

1. Knee number: the knee number starting from the highest knee. (The first knees listed will generally be at SRD and the top of sonic. The drift imposed at these knees will normally be zero.)

2. Measured depth from DF: the depth in meters from DF

3. Vertical depth from MSL: the depth in meters from seismic reference datum.

4. Selected Drift at knee: the value of drift imposed at each knee.

5. Shift: the change in drift divided by the change in depth between any two levels.

6. Delta-T: see section 4 of report for an explanation of Δt_{min}.

7. Reduction factor G: see section 4 of report.

8. Selected Drift Gradient: the gradient of the imposed drift curve.

Sonic Adjustment Data

1. Measured depth from DF: the depth in meters from DF
2. Vertical depth from MSL: the depth in meters from seismic reference datum.
3. Vertical shot time MSL to GEO: the calculated vertical travel time from datum to geophone.
4. Adjusted Sonic Time.
5. Computed drift at level: the checkshot time minus the integrated raw sonic time.
6. Residual Shot Time - Adjusted Sonic Time.
7. Adjusted Interval Velocity.
8. Adjusted RMS Velocity.
9. Adjusted Average Velocity.

A3 Velocity Report

The data in this listing has been resampled in time.

1. Two way travel time from MSL: this is the index for the data in this listing. The first value is at MSL (0 ms) and the reporting interval is 10 ms.

2. Measured depth from DF: the depth from DF at each corresponding value of two way time.

3. Vertical depth from MSL: the vertical depth from MSL at each corresponding value of two way time.

4. Average velocity MSL to GEO: the vertical depth from MSL divided by half the two way time.

5. RMS velocity: the root mean square velocity from datum to the corresponding value of two way time.

$$v_{rms} = \sqrt{ (\Sigma v_i^2 t_i / \Sigma t_i) }$$

where v_i is the velocity between each 2 ms interval.

6. Interval velocity: the velocity between each sampled depth.

A4 Time to Depth

1. Two Way Sonic Time from MSL

2-11. Depth at Time, ms: times every 1 ms

Client and Well Information

Country	**Australia**
Logging Date	**22-May-2004**
Company	**ESSO Australia Pty Ltd**
Field	**Near Field Wildcat**
Well	**West Whiptail-1**

Seismic Reference Datum : **MSL** Water Velocity : 1524 m/s

DF Elevation above MSL : 39 m

Time Picking on Geophone Transformed GAC Stacks

Check Shot Data

LEVEL NUMBER	VERTICAL DEPTH FROM MSL m	MEASURED DEPTH FROM DF m	OBSERVED TRAVEL TIME s	VERTICAL TRAVEL TIME MSL (OWT) s	DELTA DEPTH m	DELTA TIME s	ACOUSTIC INTERVAL VELOCITY m/s	ACOUSTIC AVERAGE VELOCITY m/s	ACOUSTIC RMS VELOCITY m/s
1	0.0			0.0000					
							1665		
2	60.9	99.9	0.0330	0.0366				1665	1665
					50.0	0.0276	1812		
3	110.9	149.9	0.0592	0.0642				1728	1729
					50.0	0.0252	1981		
4	160.9	199.9	0.0840	0.0894				1799	1804
					50.0	0.0234	2134		
5	210.9	249.9	0.1071	0.1129				1869	1877
					50.0	0.0224	2234		
6	260.9	299.9	0.1294	0.1352				1929	1941
					50.1	0.0219	2285		
7	311.0	350.0	0.1512	0.1572				1979	1992
					49.9	0.0200	2496		
8	360.9	399.9	0.1711	0.1771				2037	2055
					50.1	0.0194	2581		
9	410.9	450.0	0.1905	0.1966				2091	2113
					49.9	0.0194	2565		
10	460.8	499.9	0.2100	0.2160				2133	2158
					50.0	0.0206	2428		
11	510.8	550.0	0.2306	0.2366				2159	2182
					49.8	0.0191	2609		
12	560.6	599.8	0.2497	0.2557				2193	2217
					50.1	0.0179	2798		
13	610.6	649.9	0.2676	0.2736				2232	2260
					50.0	0.0189	2652		
14	660.7	700.0	0.2864	0.2924				2259	2287
					17.0	0.0058	2933		
15	677.7	717.0	0.2922	0.2982				2272	2301
					37.9	0.0123	3077		

LEVEL NUMBER	VERTICAL DEPTH FROM MSL m	MEASURED DEPTH FROM DF m	OBSERVED TRAVEL TIME s	VERTICAL TRAVEL TIME MSL (OWT) s	DELTA DEPTH m	DELTA TIME s	ACOUSTIC INTERVAL VELOCITY m/s	ACOUSTIC AVERAGE VELOCITY m/s	ACOUSTIC RMS VELOCITY m/s
16	715.6	755.0	0.3046	0.3105				2304	2337
					44.9	0.0163	2753		
17	760.5	800.0	0.3209	0.3269				2327	2359
					49.9	0.0192	2603		
18	810.4	850.0	0.3401	0.3460				2342	2374
					49.8	0.0200	2488		
19	860.1	899.9	0.3602	0.3660				2350	2380
					49.9	0.0211	2367		
20	910.1	950.0	0.3814	0.3871				2351	2379
					49.7	0.0207	2409		
21	959.8	999.9	0.4021	0.4078				2354	2381
					49.8	0.0211	2367		
22	1009.6	1049.9	0.4232	0.4288				2354	2380
					49.8	0.0209	2383		
23	1059.5	1099.9	0.4442	0.4497				2356	2380
					49.8	0.0218	2290		
24	1109.3	1149.9	0.4660	0.4715				2353	2376
					49.8	0.0178	2793		
25	1159.2	1199.9	0.4839	0.4893				2369	2393
					49.9	0.0180	2766		
26	1209.1	1250.0	0.5020	0.5074				2383	2407
					14.9	0.0056	2660		
27	1224.0	1265.0	0.5077	0.5130				2386	2410

Attachment 3: Listing of Deliverables (CD-ROM)

Report:

CS_report	Checkshot/Geogram Processing Report	PDF

Graphics Displays:

comp1	Plot 1. Composite Display 1– Normal Polarity	PDF / PDS / CGM
comp2	Plot 2. Composite Display 2 – Reverse Polarity	PDF / PDS / CGM
vel1	Plot 3. Velocity Crossplot	PDF / PDS / CGM

Data files plus Verification (.txt) listings:

WW1_rawx.sgy	raw x axis downhole data	SEGY
WW1_rawy.sgy	raw y axis downhole data	SEGY
WW1_rawz.sgy	raw z axis downhole data	SEGY
WW1_rawh.sgy	surface sensor data	SEGY
WW1_xstk.sgy	stacked x axis data	SEGY
WW1_ystk.sgy	stacked y axis data	SEGY
WW1_zstk.sgy	stacked z axis data	SEGY
WW1_synt_R20.sgy	Zero Phase Synthetic Seismograms – Ricker 20Hz	SEGY
WW1_synt_R30.sgy	Zero Phase Synthetic Seismograms – Ricker 30Hz	SEGY
WW1_synt_R40.sgy	Zero Phase Synthetic Seismograms – Ricker 40Hz	SEGY
WW1_synt_Q20.sgy	Quad Phase Synthetic Seismograms – Ricker 20Hz	SEGY
WW1_synt_Q30.sgy	Quad Phase Synthetic Seismograms – Ricker 30Hz	SEGY
WW1_synt_Q40.sgy	Quad Phase Synthetic Seismograms – Ricker 40Hz	SEGY
logs_depth.las	Depth indexed Logs	ASCII (LAS)
logs_time.las	Time indexed Logs	ASCII (LAS)
synthetics.las	Synthetic Seismograms and Corridor Stack	ASCII (LAS)

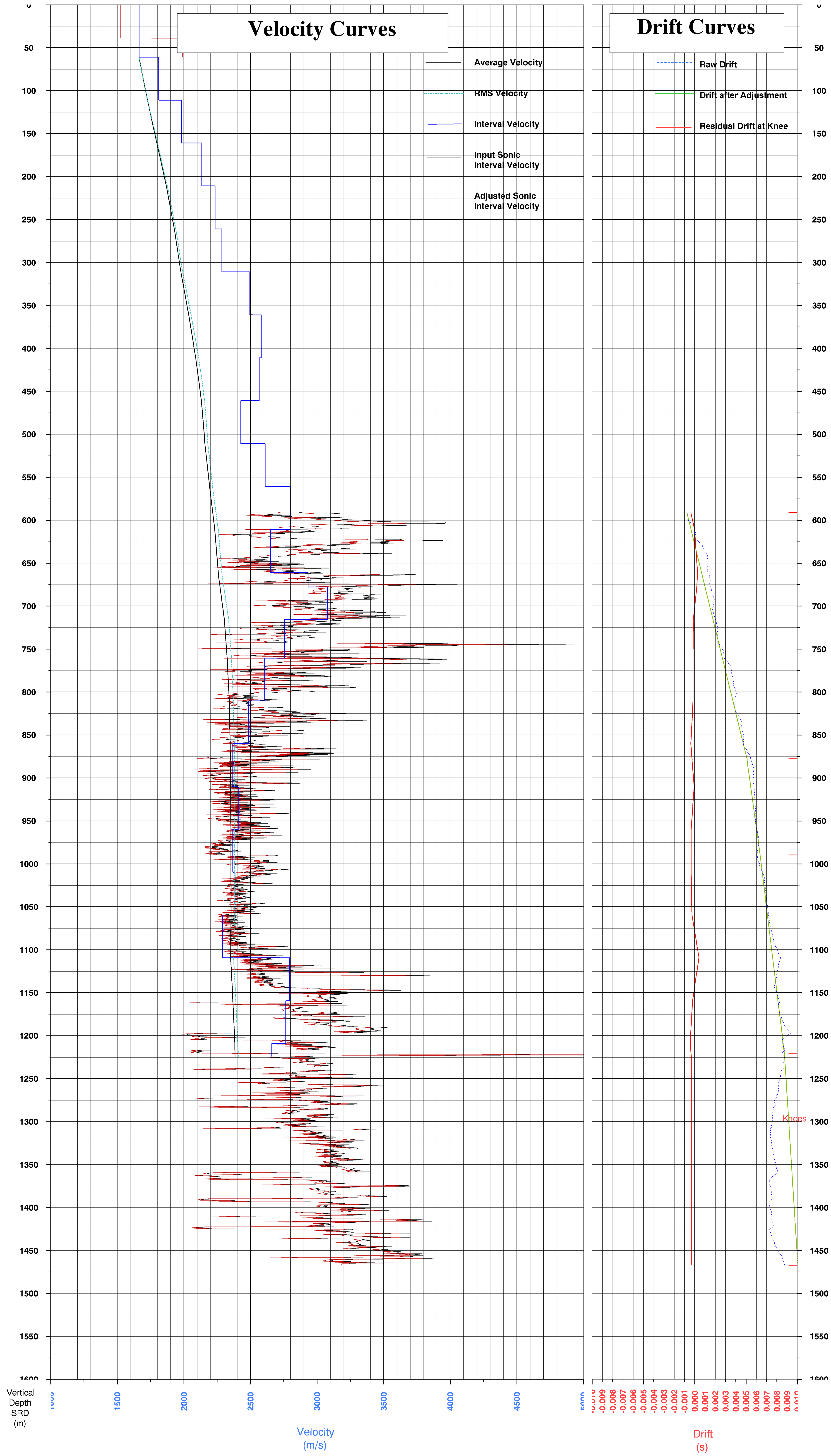
Listings:

A1	Well_Seismic_Report	EXCEL
A2	Drift_and_Sonic_Adjustment_Report	EXCEL
A3	Velocity_Report	EXCEL
A4	Time_to_Depth_Report	EXCEL

Schlumberger Checkshot GEOGRAM

VELOCITY CROSS PLOT

Company	**: ESSO Australia Pty Ltd**
Well	**: West Whiptail-1**
Field	**: Near Field Wildcat**
Country	**: Australia**
State	**: Offshore VIC**
SRD	**: MSL**
Job Ref	**: DS 1104-06**



Vertical Depth SRD (m)	Vertical Time from SRD (owt, s)	Measured Depth from KB (m)	Level Number
60.9	0.0366	99.9	1
110.9	0.0642	149.9	2
160.9	0.0894	199.9	3
210.9	0.1129	249.9	4
260.9	0.1352	299.9	5
311.0	0.1572	350.0	6
360.9	0.1771	399.9	7
410.9	0.1966	450.0	8
460.8	0.2160	499.9	9
510.8	0.2366	550.0	10
560.6	0.2557	599.8	11
610.6	0.2736	649.9	12
660.7	0.2924	700.0	13
677.7	0.2982	717.0	14
715.6	0.3105	755.0	15
760.5	0.3269	800.0	16
810.4	0.3460	850.0	17
860.1	0.3660	899.9	18
910.1	0.3871	950.0	19
959.8	0.4078	999.9	20
1009.6	0.4288	1049.9	21
1059.5	0.4497	1099.9	22
1109.3	0.4715	1149.9	23
1159.2	0.4893	1199.9	24
1209.1	0.5074	1250.0	25
1224.0	0.5130	1265.0	26

Display Parameters:

Depth Scale: 1:2000
Log Index: Vertical Depth SRD

APPENDIX 5

PVT REPORT

A. C. N. # 008 130 667
September 6, 2004
P.O. Box 410
Magill,
SA 5072

Esso Australia Limited
GPO Box 400C
Melbourne
Vic 3001

Subject: PVT Study
Well : West Whiptail # 1
File : E - 24014

Attention: Mr. Tim Hart

Dear Sirs,

On May 22, 2004, representatives from Petrolab received 450 cc MPSR chambers and one 1 gallon MRSC chamber containing fluids sampled during Drill Stem Testing of the subject well. The bottom hole samples, taken by Schlumberger, were transferred by Petrolab on-site the Ensco 102 Rig, in single phase, into high pressure laboratory storage cylinders, to be used in a reservoir fluid study. The results of this study are presented in the following report.

On-site analyses for H2S were performed on solution gas flashed from the highly under-saturated oil. The GOR was determined in the field at the same time. The samples were then dispatched to our laboratory in Adelaide to be used in further fluid studies. The results of this study are presented in the following report.

The validity of the transferred samples was checked by measuring their bubble point pressures at room temperature at our laboratory in Adelaide.

The compositions of the bottom hole reservoir fluids were obtained by flashing the sample under atmospheric conditions into two phases. Through measurements of densities, molecular weights, quantities produced and compositions of the evolved stock tank gases and liquids from the flash experiments, we were able to mathematically recombine these products into the desired fluid compositions.

The reservoir fluid compositions were extended to C-12+ by means of a High Temperature

Distillation on flashed stock tank oil.

The bottom hole reservoir fluid was then introduced into a high pressure PVT cell and thermally expanded to the reservoir temperature of 153 °F. During a constant composition expansion at this temperature, a bubble point of 216 psig was determined. Other data obtained during this pressure - volume relations experiment, include relative volume versus pressure, oil thermal expansion and compressibility above bubble point and calculated Y- function below it.

During pressure depletion at the reservoir temperature, the viscosity of the oil phase of the reservoir fluid was determined in a rolling ball viscosimeter. The viscosity of the fluid was found to decrease from 1.50 centipoise at the reservoir pressure and temperature to a minimum of 1.28 centipoise at the bubble point.

We thank Esso Australia Limited for the opportunity to be of service. Please do not hesitate in contacting us should you require any further information or if we can assist you in any other way.

Yours Sincerely,

Jan G. Bon
Manager

INDEX

MDT SAMPLES

DRILL CUTTINGS SAMPLES

SUMMARY OF RESULTS

CONSTANT MASS DATA :

Reservoir Temperature (°F)	:	153
Saturation Pressure (psig)	:	216
Thermal Expansion of Saturated Oil		
@ 153 °F AND 216 PSIG (*10^4/°F)	:	4.87
(*10^4/°C)	:	8.77
Compressibility of Saturated Oil		
@ 153 °F AND 216 PSIG (*10^6/psi)	:	10.80

SATURATED OIL @ 153 °F AND 216 PSIG :

Oil density (gm/cc)	:	0.7664
Specific Volume (ft^3/lb)	:	0.0209
Viscosity (cp)	:	1.28

RESIDUAL OIL :

API Gravity @ 60 °F	:	43.0
Formation Volume Factor	:	1.045
Density @ 153 °F (gm/cc)	:	0.7751
Viscosity @ 0 °F (cp)	:	1.46
Pour Point (°C)		9
Flash Point (°C)		< 15
Wax Content (wt %)	:	8.8

RESERVOIR OIL @ 153 °F AND 1924 PSIG :

Solution GOR (SCF/Bbl)	:	**Rs**	**41**
Formation Volume Factor (Resbbl/STbbl)	:	**Bo**	**1.052**

SATURATED OIL @ 153 °F AND 216 PSIG :

Solution GOR (SCF/Bbl)	:	**Rs**	**41**
Formation Volume Factor (Resbbl/STbbl)	:	**Bo**	**1.063**

FIELD TRANSFER DETAILS

OF RESERVOIR FLUID SAMPLED @ 1412.5 mRT

@ 5000 psig & 18 °C

Schlumberger Sample ID No.	Sampled in Schlumberger Chamber No.	Sample Volume Transferred (cc)	Transferred to Petrolab Cylinder No.
T.01	MPSR 0478	435	L-323
T.02	MPSR 0494	430	L-048
T.03	MPSR 1178	430	L-405
T.04	MPSR 1695	420	L-184
T.05	MPSR 1760	430	L-294
T.06			
T.06 - transfer 1	MRSC BB-19	600	L-163
T.06 - transfer 2	MRSC BB-19	600	L-092
T.06 - transfer 3	MRSC BB-19	600	L-428
T.06 - transfer 4	MRSC BB-19	600	L-139

Field Analyses on the 1 Gallon MRSC Chamber :

Density	0.8091 @ 60 ºF	43.2 API
H2S	< 0.1 ppm	< 0.1 ppm

Volumes recovered (ccs)

OIL	GAS	WATER
3250	30000	150

GOR (scf/bbl)	41	44

4 * 600 ccs were transferred into sample cylinders listed under T.06
850 ccs of stock tank oil and 150 ccs of water / mud filtrate were flashed off

FIELD CHARACTERISTICS :

Field Name	:	Whiptail
Formation Name	:	N - 1
Pool (or Zone)	:	West Whiptail
Date first well completed	:	August 1985
Original reservoir pressure (psia)	:	--
@ datum (mKB)	:	--

WELL CHARACTERISTICS :

Depth datum (mKB)	:	--
Elevation above MSL (m)	:	--
Total depth (m RT)	:	--
Producing interval (mAHBRT)	:	--
Perforated intervals (m KB)	:	--
Tubing size (inch)	:	--
Tubing shoe (m)	:	--
Casing size (inch)	:	--
Reservoir temperature (°F)	:	155
Last reservoir pressure (psia)	:	1954
@ datum (mKB)	:	1380 - 2
date	:	18th August, 1985
Status of well	:	--

SAMPLING CONDITIONS :

Depth Sampled (m RT)	:	1412.5	1412.5	1412.5	1412.5	1412.5
Reservoir Temperature (°F)	:	153	153	153	153	153
Reservoir Pressure (psia)	:	1938	1938	1938	1938	1938
Date sampled	:	May 22, 2004	May 22, 2004	May 22, 2004	May 22, 2004	May 22, 2004
Sampled by	:	Schlumberger	Schlumberger	Schlumberger	Schlumberger	Schlumberger
Tranfered By	:	Petrolab	Petrolab	Petrolab	Petrolab	Petrolab
From Schlumberger MPSR - BHS #	:	0478	0494	1178	1695	1760
Size Sampler (ccs)	:	450	450	450	450	450
Transferred into	:	L - 323	L - 048	L - 405	L - 184	L - 294
FromSchlumberger MRSC - BHS #	:		19	19	19	19
Size Sampler (ccs)	:		1 gallon	1 gallon	1 gallon	1 gallon
Transferred into	:		L - 163	L - 092	L - 428	L 139

Room Temperature Validity Check On Bottom Hole Sample

Saturation Pressure : 176 psig @ 18 ° C

Sample # 1

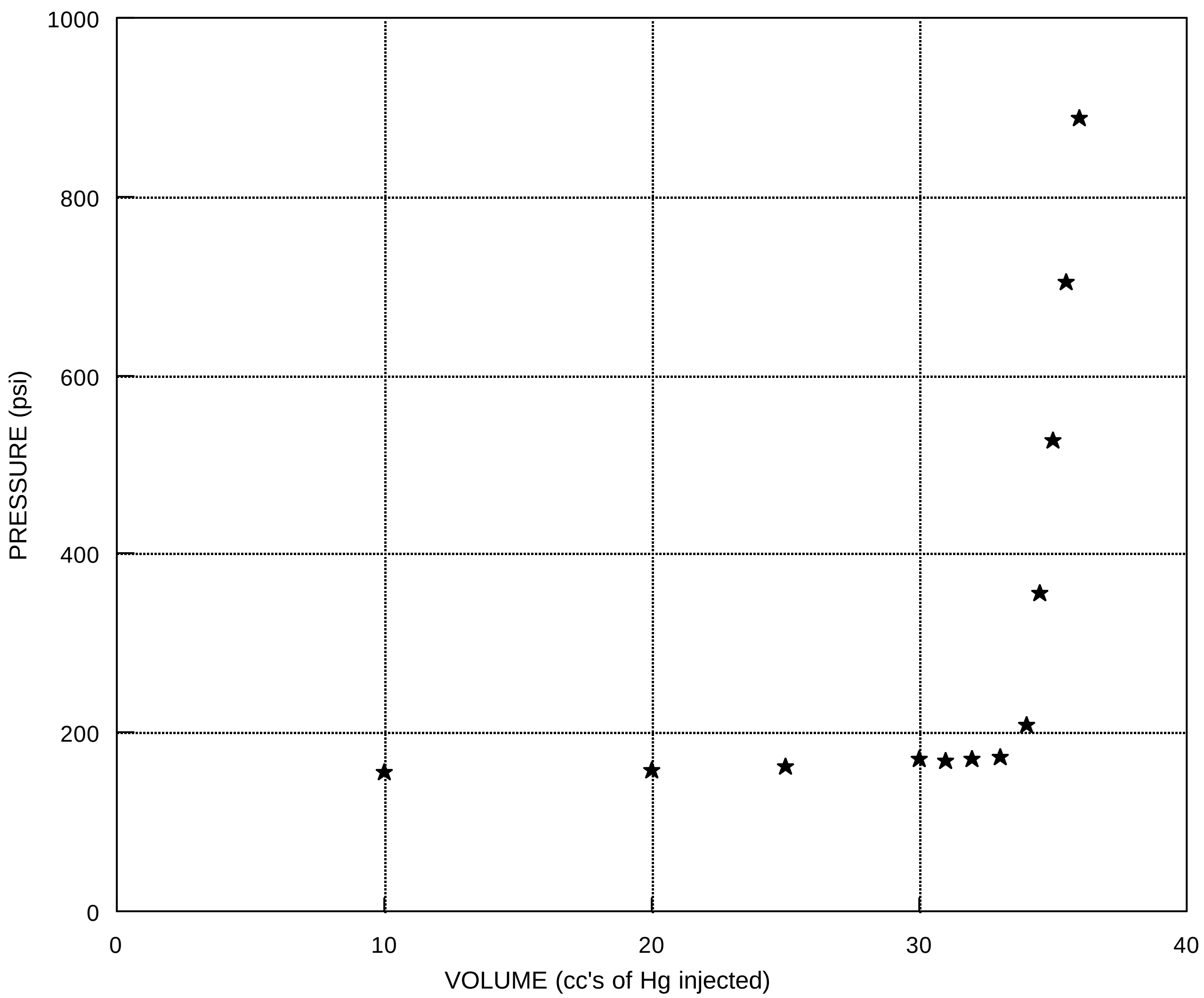
Sampling Conditions

Date	:	May 22, 2004
Reservoir Pressure	:	1938.4 psia
Reservoir Temperature	:	67.2 °C

Sampler ID	:	MPSR S/N 0478
Volume	:	450cc
Depth	:	1412.5 mMD

Tranferred into Cylinder #	:	L-323

Volume (cc's)	Pressure (psi)
10.00	156
20.00	159
25.00	163
30.00	172
31.00	170
32.00	172
33.00	173
34.00	209
34.50	356
35.00	528
35.50	705
36.00	887



Room Temperature Validity Check On Bottom Hole Sample

Saturation Pressure : 185 psig @ 18 ° C

Sample # 2

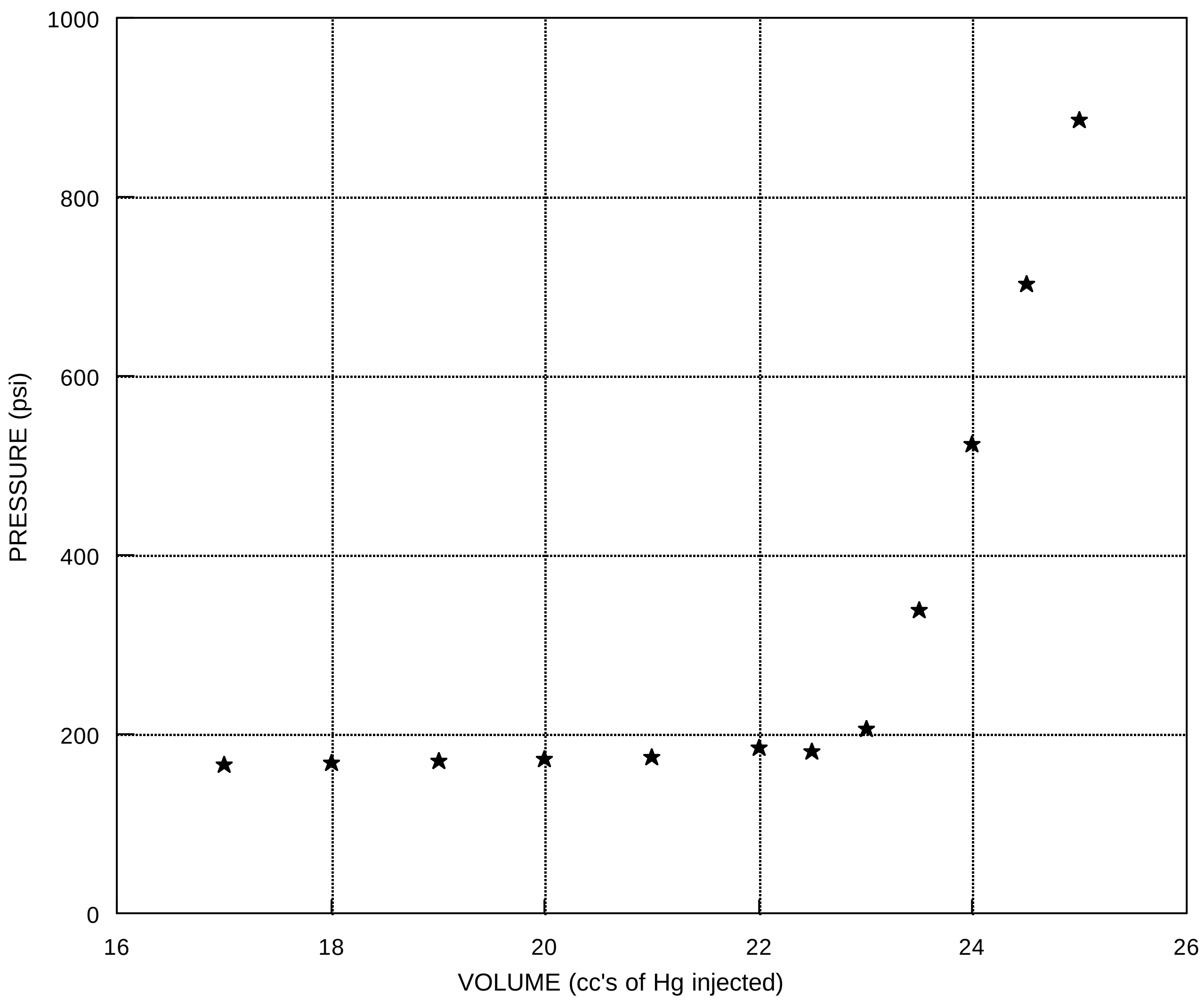
Sampling Conditions

Date	:	May 22, 2004
Reservoir Pressure	:	1938.4 psia
Reservoir Temperature	:	67.2 °C

Sampler ID	:	MPSR S/N 0494
Volume	:	450cc
Depth	:	1412.5 mMD

Tranferred into Cylinder #	:	L-048

Volume (cc's)	Pressure (psi)
17.00	168
18.00	169
19.00	171
20.00	173
21.00	176
22.00	185
22.50	182
23.00	206
23.50	339
24.00	525
24.50	703
25.00	885



Room Temperature Validity Check On Bottom Hole Sample

Saturation Pressure : 200 psig @ 16 ° C

Sample # 3

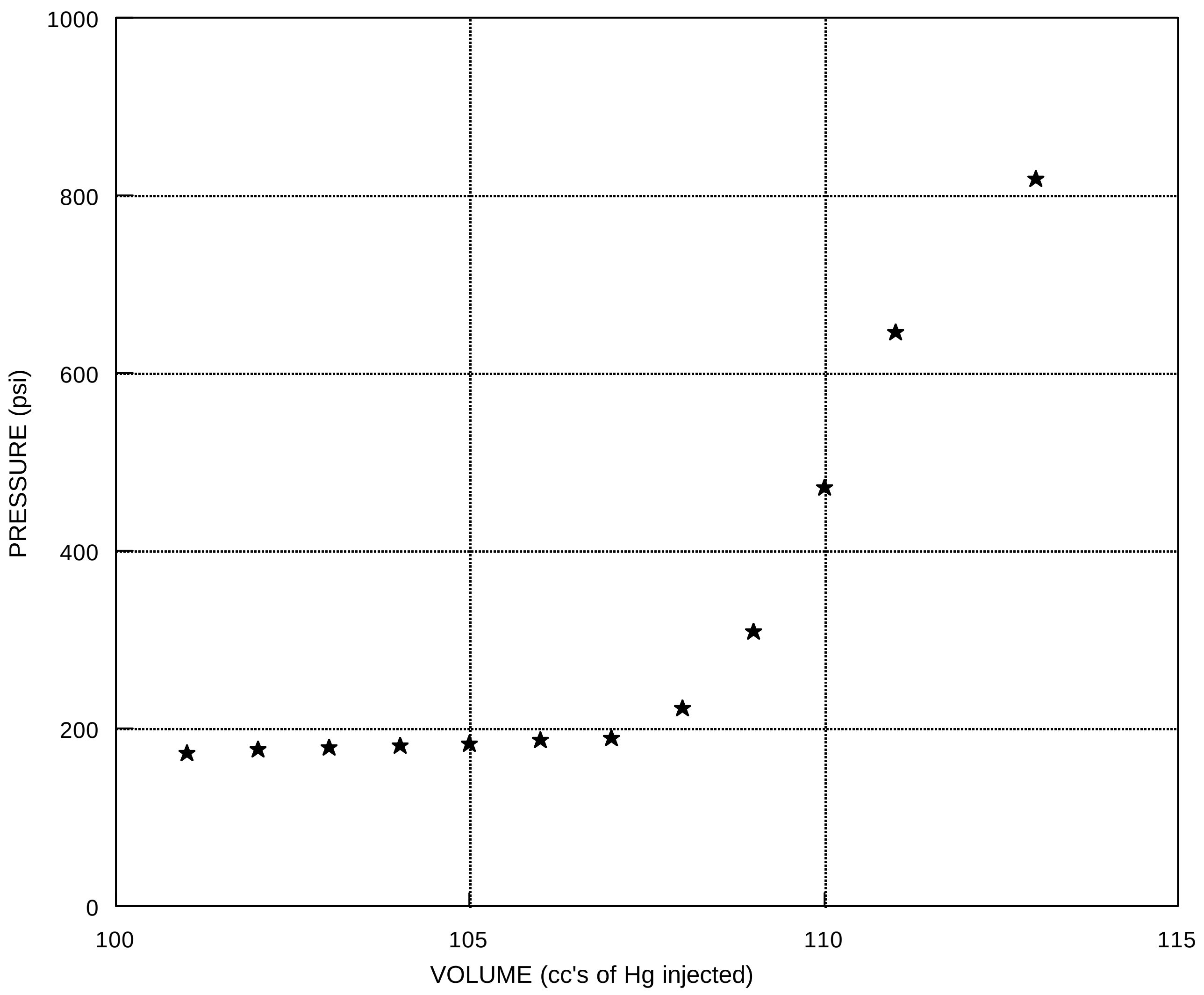
Sampling Conditions

Date	:	May 22, 2004
Reservoir Pressure	:	1938.4 psia
Reservoir Temperature	:	67.2 °C

Sampler ID	:	MPSR S/N 1178
Volume	:	450cc
Depth	:	1412.5 mMD

Tranferred into Cylinder #	:	L-405

Volume (cc's)	Pressure (psi)
101.00	174
102.00	178
103.00	179
104.00	182
105.00	184
106.00	187
107.00	191
108.00	224
109.00	309
110.00	471
111.00	646
113.00	819



Room Temperature Validity Check On Bottom Hole Sample

Saturation Pressure : 176 psig @ 19 ° C

Sample # 4

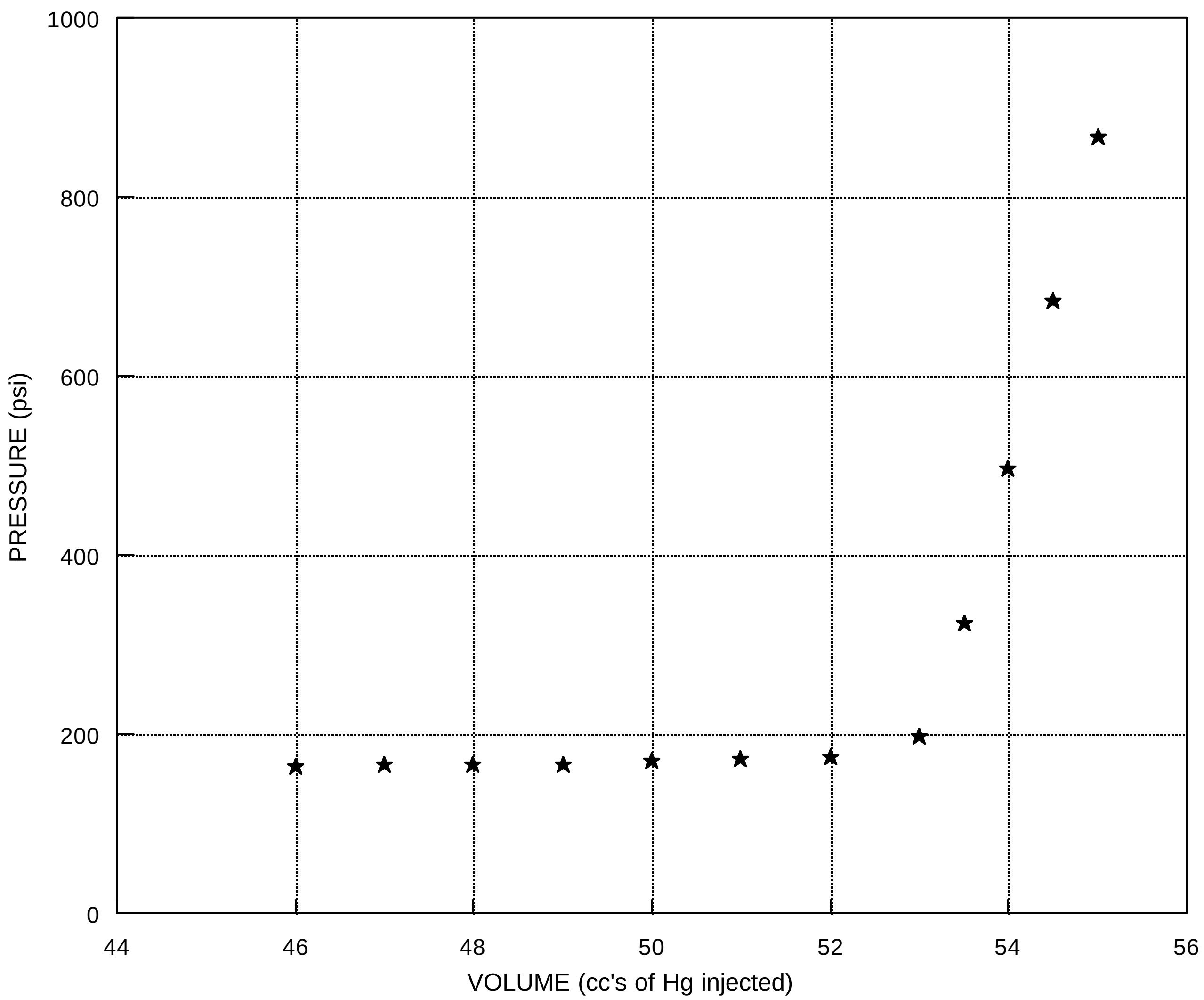
Sampling Conditions

Date	:	May 22, 2004
Reservoir Pressure	:	1938.4 psia
Reservoir Temperature	:	67.2 °C

Sampler ID	:	MPSR S/N 1695
Volume	:	450cc
Depth	:	1412.5 mMD

Tranferred into Cylinder #	:	L-184

Volume (cc's)	Pressure (psi)
46.00	165
47.00	166
48.00	167
49.00	168
50.00	171
51.00	174
52.00	176
53.00	198
53.50	324
54.00	498
54.50	685
55.00	868



Reservoir Temperature Validity Check On Bottom Hole Sample

Saturation Pressure : 190 psig @ 18 ° C

Sample # 5

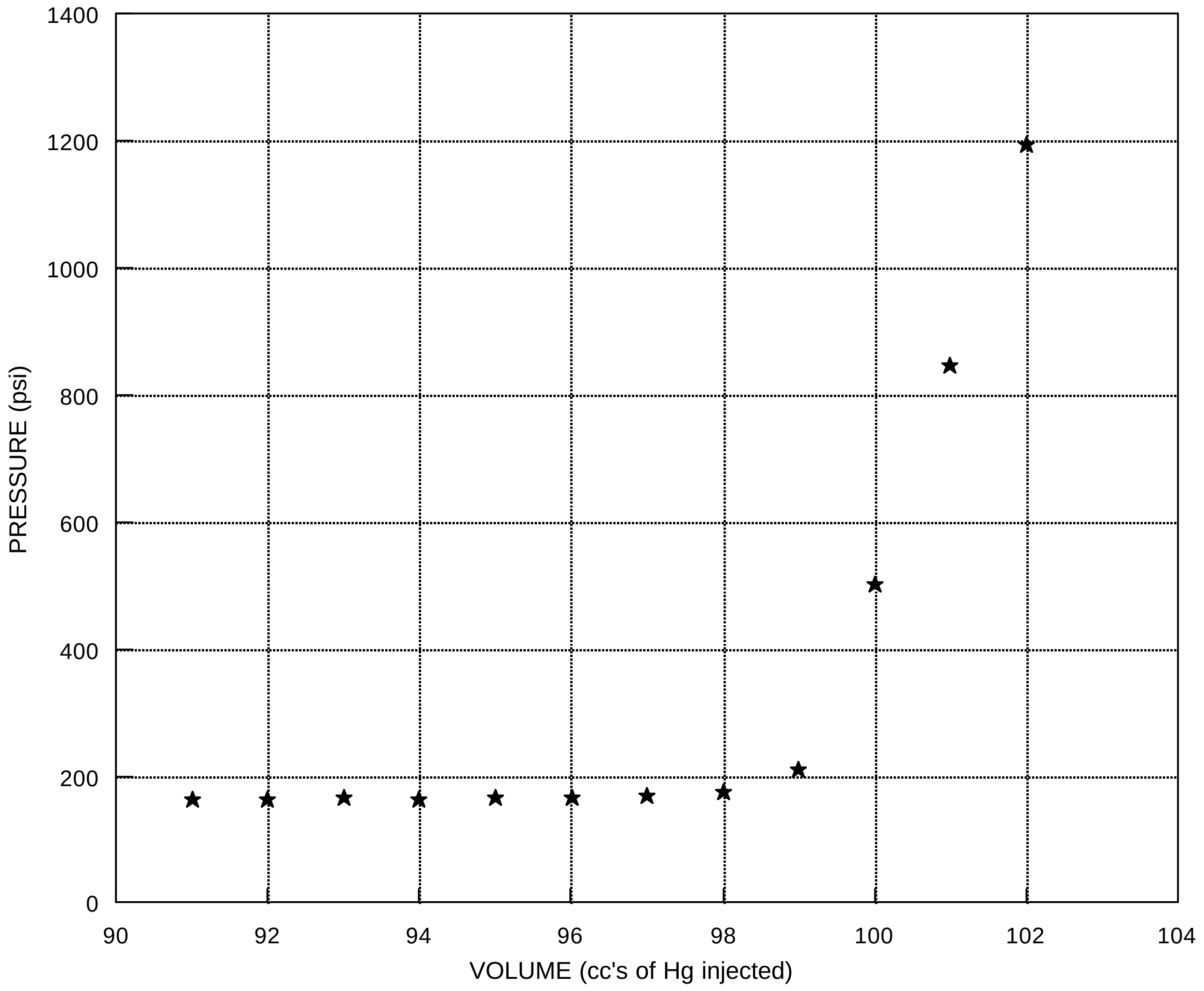
Sampling Conditions

Date	:	May 22, 2004
Reservoir Pressure	:	1938.4 psia
Reservoir Temperature	:	67.2 °C

Sampler ID	:	MPSR S/N 1760
Volume	:	450cc
Depth	:	1412.5 mMD

Tranferred into Cylinder #	:	L-294

Volume (cc's)	Pressure (psi)
91.00	162
92.00	164
93.00	165
94.00	164
95.00	165
96.00	167
97.00	170
98.00	174
99.00	210
100.00	502
101.00	845
102.00	1193



Room Temperature Validity Check On Bottom Hole Sample

Saturation Pressure : 202 psig @ 19 ° C

Sample # 6a

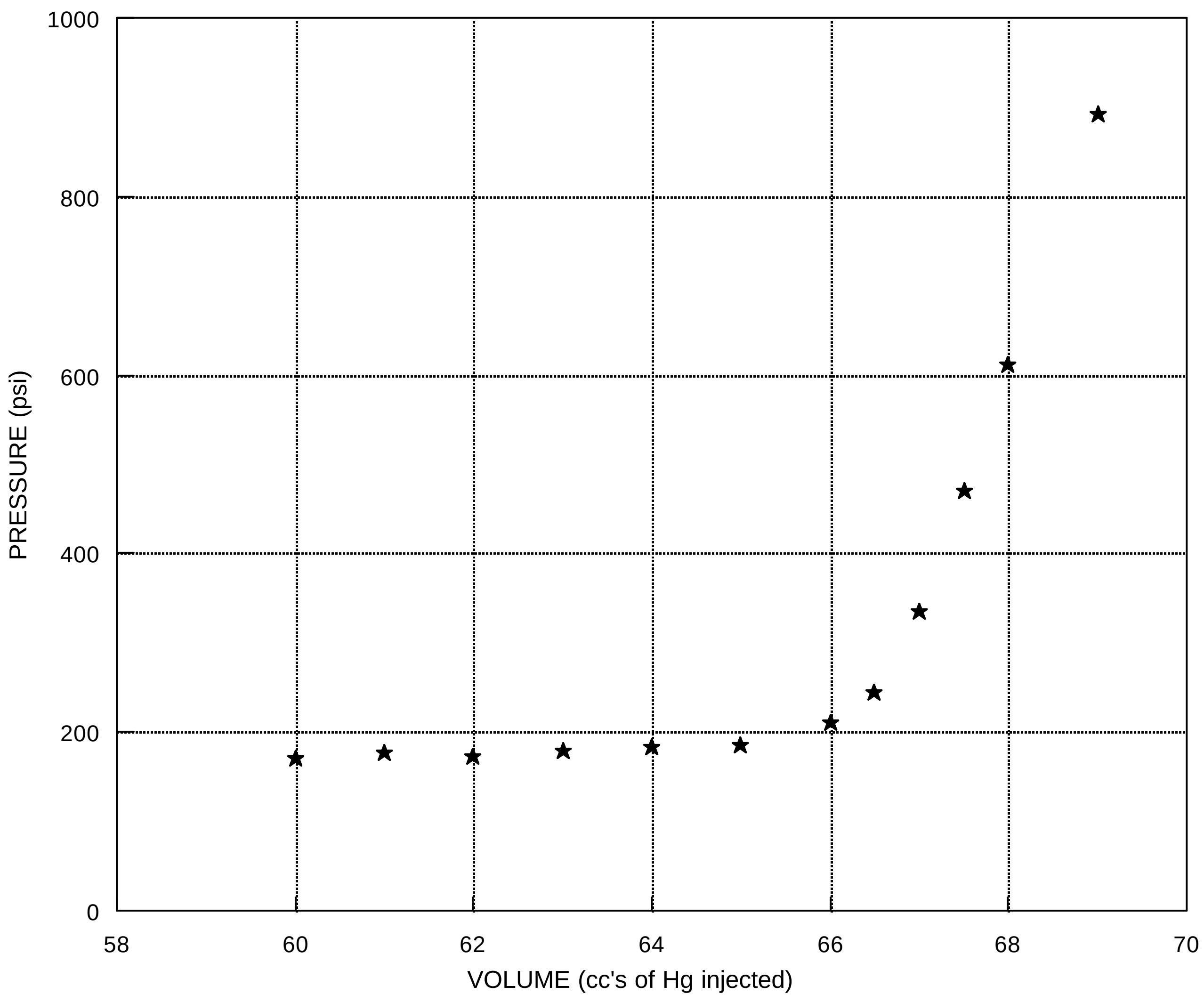
Sampling Conditions

Date	:	May 22, 2004
Reservoir Pressure	:	1938.4 psia
Reservoir Temperature	:	67.2 ° C

Sampler ID	:	S/N 19
Volume	:	1 gallon
Depth	:	1412.5 mMD

Tranferred into Cylinder #	:	L-163

Volume (cc's)	Pressure (psi)
60.00	171
61.00	177
62.00	173
63.00	179
64.00	183
65.00	185
66.00	211
66.50	245
67.00	335
67.50	470
68.00	611
69.00	891



Room Temperature Validity Check On Bottom Hole Sample

Saturation Pressure : 188 psig @ 19 ° C

Sample # 6b

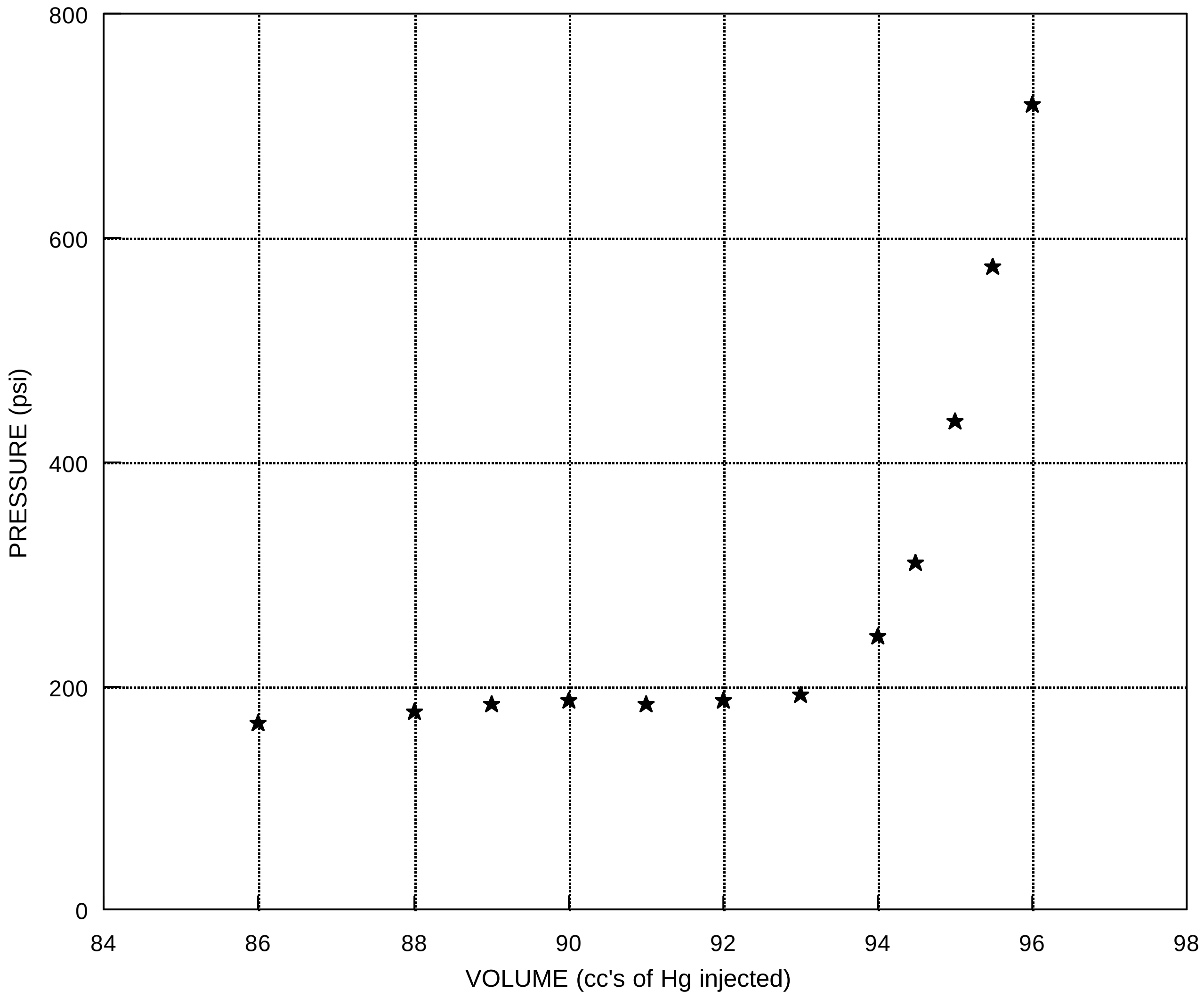
Sampling Conditions

Date	:	May 22, 2004
Reservoir Pressure	:	1938.4 psia
Reservoir Temperature	:	67.2 ° C

Sampler ID	:	S/N 19
Volume	:	1 gallon
Depth	:	1412.5 mMD

Tranferred into Cylinder #	:	L-092

Volume (cc's)	Pressure (psi)
86.00	167
88.00	178
89.00	185
90.00	188
91.00	184
92.00	188
93.00	192
94.00	244
94.50	310
95.00	437
95.50	574
96.00	718



Room Temperature Validity Check On Bottom Hole Sample

Saturation Pressure : 190 psig @ 19 ° C

Sample # 6c

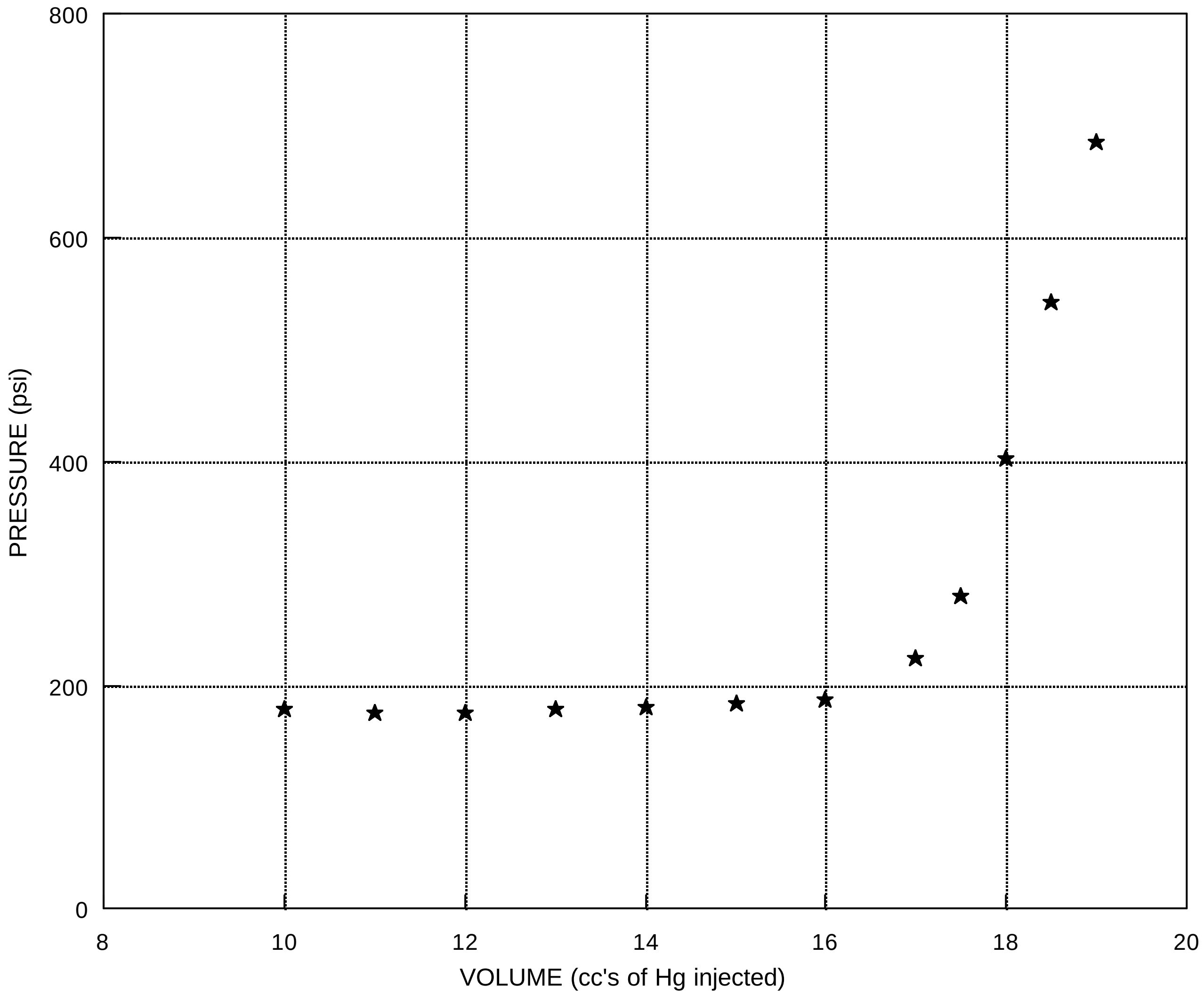
Sampling Conditions

Date	:	May 22, 2004
Reservoir Pressure	:	1938.4 psia
Reservoir Temperature	:	67.2 ° C

Sampler ID	:	S/N 19
Volume	:	1 gallon
Depth	:	1412.5 mMD

Tranferred into Cylinder #	:	L-428

Volume (cc's)	Pressure (psi)
10.00	179
11.00	176
12.00	176
13.00	179
14.00	181
15.00	184
16.00	188
17.00	225
17.50	280
18.00	403
18.50	542
19.00	685



Room Temperature Validity Check On Bottom Hole Sample

Saturation Pressure : 188 psig @ 18 ° C

Sample # 6d

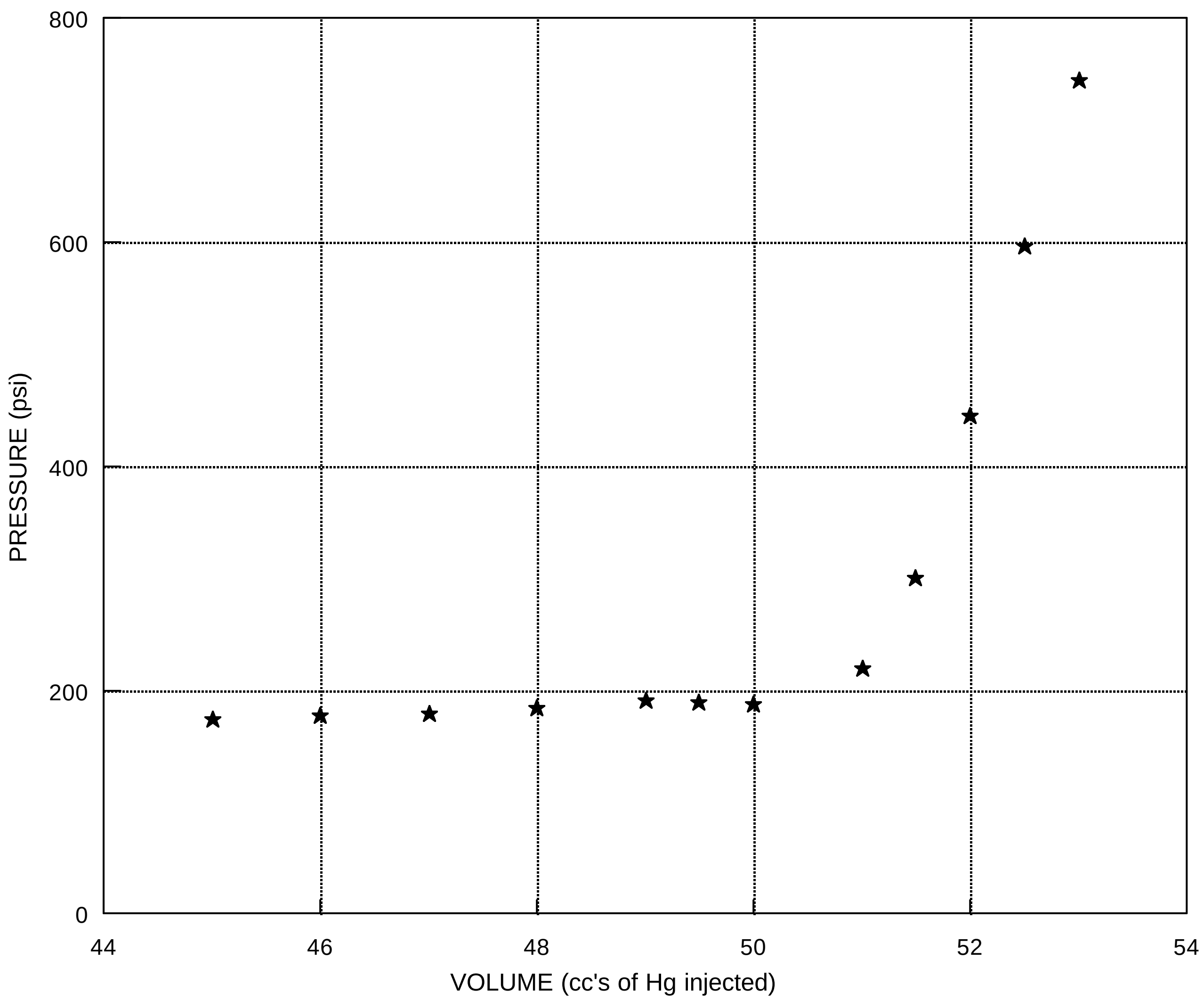
Sampling Conditions

Date	:	May 22, 2004
Reservoir Pressure	:	1938.4 psia
Reservoir Temperature	:	67.2 ° C

Sampler ID	:	S/N 19
Volume	:	1 gallon
Depth	:	1412.5 mMD

Tranferred into Cylinder #	:	L-139

Volume (cc's)	Pressure (psi)
45.00	174
46.00	177
47.00	179
48.00	184
49.00	191
49.50	189
50.00	188
51.00	219
51.50	301
52.00	445
52.50	596
53.00	744



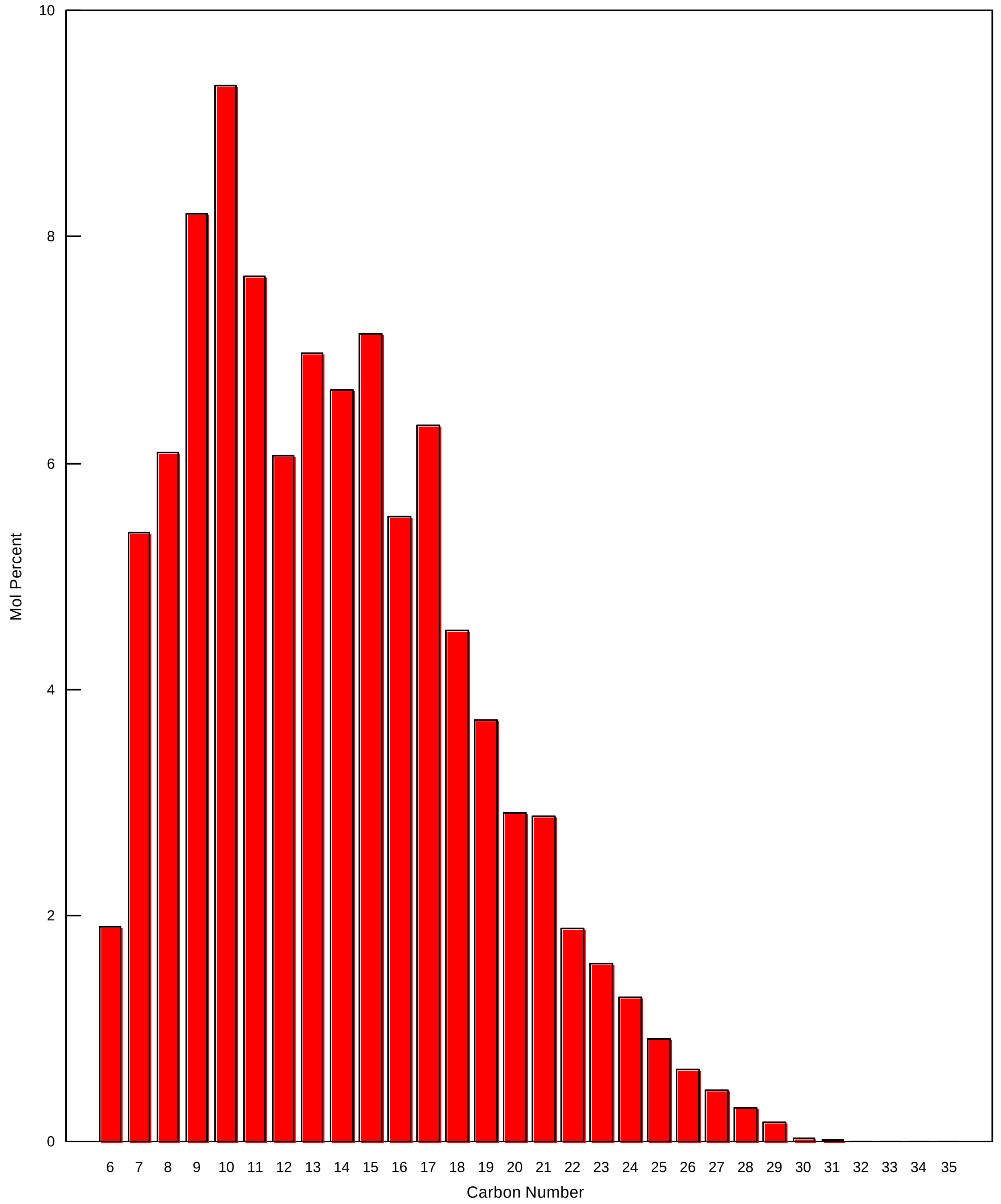
FINGERPRINT ANALYSIS
BY CAPILLARY GAS CHROMATOGRAPHY
On Stock Tank Oil from atmospheric flash of sample in cylinder # L 139

Component		Mol %
Hexanes minus	C6-	1.41
Hexanes	C6	1.91
Heptanes	C7	5.39
Octanes	C8	6.09
Nonanes	C9	8.20
Decanes	C10	9.33
Undecanes	C11	7.65
Dodecanes	C12	6.07
Tridecanes	C13	6.97
Tetradecanes	C14	6.64
Pentadecanes	C15	7.14
Hexadecanes	C16	5.53
Heptadecanes	C17	6.33
Octadecanes	C18	4.52
Nonadecanes	C19	3.73
Eicosanes	C20	2.91
Heneicosanes	C21	2.88
Docosanes	C22	1.89
Tricosanes	C23	1.58
Tetracosanes	C24	1.28
Pentacosanes	C25	0.91
Hexacosanes	C26	0.64
Heptacosanes	C27	0.46
Octacosanes	C28	0.30
Nonacosanes	C29	0.17
Triacontanes	C30	0.03
Hentriacontanes	C31	0.02
Dotriacontanes	C32	0.01
Tritriacontanes	C33	0.01
Tetratriacontanes	C34	0.00
Pentatriacontanes Plus	C35+	0.00
TOTAL		100.00

Molecular Weight Calculated * :	186.8
Density @ 60 °F Calculated * :	0.8205
Molecular Weight Measured :	--
Density @ 60 °F Measured :	0.8094

*Calculation based on generalized properties as published by Katz and Firoozabadi

FINGERPRINT ANALYSIS
BY CAPILLARY GAS CHROMATOGRAPHY
On Stock Tank Oil from atmospheric flash of sample in cylinder # L 139



COMPOSITIONAL ANALYSIS OF BOTTOM HOLE RESERVOIR FLUID

Cylinder # L 139 ex MRSC (1 gallon) #19 - Transfer Sample 4

Component		Stock Tank Liquid Mol %	Stock Tank Gas Mol %	Reservoir Fluid Mol %
Hydrogen Sulphide	H2S	0.00	0.00	0.00
Carbon Dioxide	CO2	0.00	0.01	0.00
Nitrogen	N2	0.00	3.09	0.21
Methane	C1	0.53	88.78	6.42
Ethane	C2	0.14	3.70	0.37
Propane	C3	0.32	2.34	0.46
Iso-Butane	iC4	0.23	0.64	0.25
N-Butane	nC4	0.17	0.33	0.18
Iso-Pentane	iC5	0.30	0.22	0.30
N-Pentane	nC5	0.20	0.11	0.19
Hexanes	C6	1.45	0.26	1.37
Heptanes	C7	3.75	0.25	3.51
Octanes	C8	7.12	0.13	6.66
Nonanes	C9	9.52	0.09	8.89
Decanes	C10	10.37	0.05	9.68
Undecanes	C11	7.51	0.00	7.00
Dodecanes Plus	C12+	58.39	0.00	54.51
TOTAL		100.00	100.00	100.00

Ratios

Molar Ratio	:	0.9333	0.0667	1.0000
Mass Ratio	:	0.9929	0.0071	1.0000
Liquid Ratio (bbl/bbl)	:	1.0000 @ SC	--	1.0631 @ PT*
Gas Liquid Ratio	:	1.0000 bbl @ SC	41 SCF	--

Stream Properties

Molecular Weight	:	189.4	18.83	178.1
Density obs. (gm/cc)	:	0.8090 @ 60 °F	--	0.7664 @ PT*
Gravity (AIR = 1.000)	:	43.2 °API @ 60 °F	0.652	52.9
GHV (BTU/scf)	:	--	1114	--

Hexanes Plus Properties

Mol %	:	98.11	0.78	91.62
Molecular Weight	:	192.2	99.2	192.2
Density (gm/cc @ 60 °F)	:	0.8111	0.6880	0.8110
Gravity (°API @ 60 °F)	:	42.8	74.0	42.8

Heptanes Plus Properties

Mol %	:	96.65	0.52	90.25
Molecular Weight	:	193.8	106.7	193.7
Density (gm/cc @ 60 °F)	:	0.8120	0.6977	0.8120
Gravity (°API @ 60 °F)	:	42.6	71.1	42.6

Decanes Plus Properties

Mol %	:	76.27	0.05	71.19
Molecular Weight	:	213.9	134.0	213.9
Density (gm/cc @ 60 °F)	:	0.8259	0.7278	0.8258
Gravity (°API @ 60 °F)	:	39.7	62.7	39.7

Undecanes Plus Properties

Mol %	:	65.90	0.00	61.51
Molecular Weight	:	224.9	--	224.9
Density (gm/cc @ 60 °F)	:	0.8334	--	0.8334
Gravity (°API @ 60 °F)	:	38.1	--	38.1

Dodecanes Plus Properties

Mol %	:	58.39	0.00	54.51
Molecular Weight	:	232.9	--	232.9
Density (gm/cc @ 60 °F)	:	0.8386	--	0.8386
Gravity (°API @ 60 °F)	:	37.1	--	37.1

* (P)ressure : 216 psig * (T)emperature : 153 °F

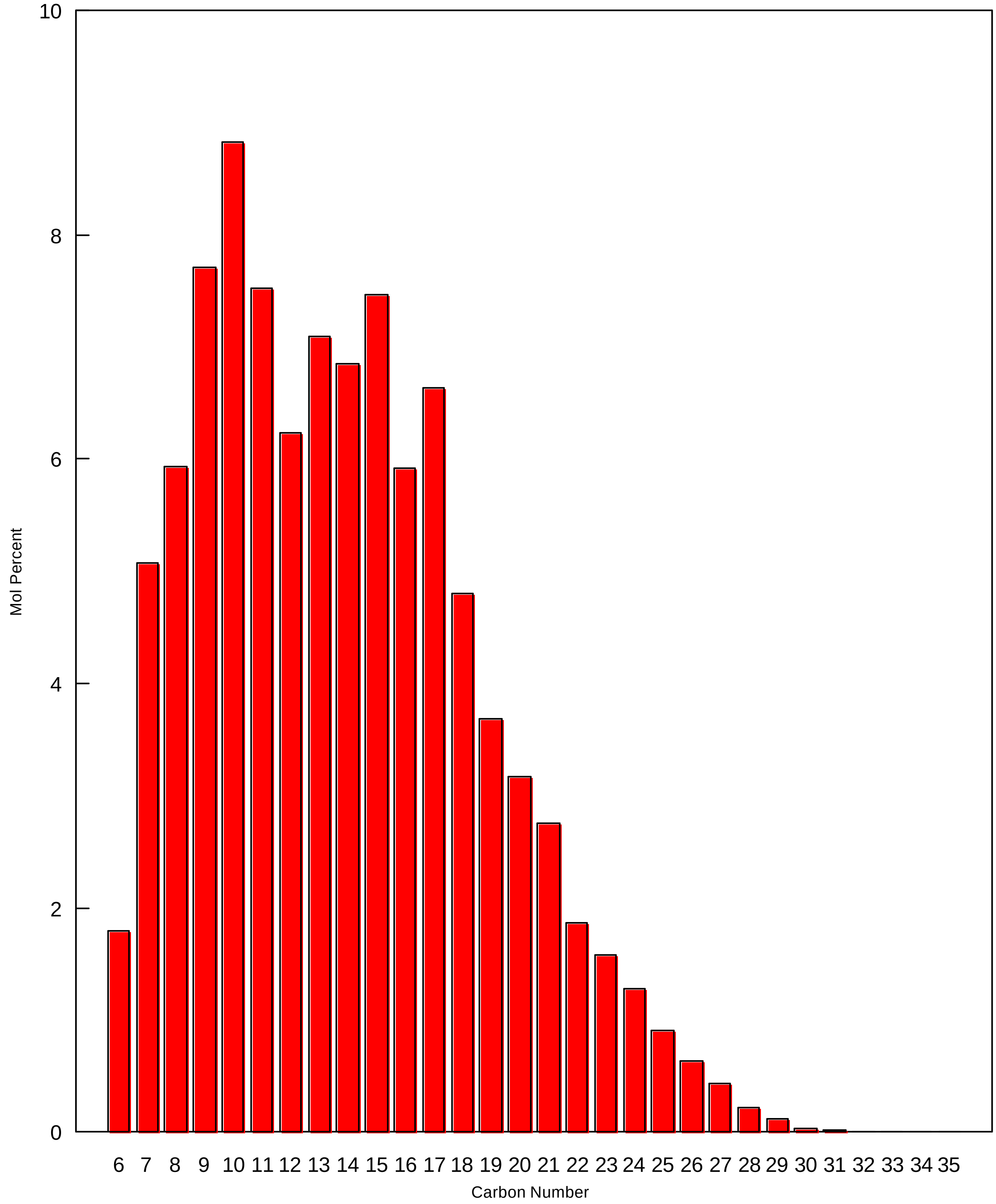
FINGERPRINT ANALYSIS
BY CAPILLARY GAS CHROMATOGRAPHY
On Stock Tank Oil from atmospheric flash of sample in cylinder # L 405

Component		Mol %
Hexanes minus	C6-	1.42
Hexanes	C6	1.79
Heptanes	C7	5.07
Octanes	C8	5.94
Nonanes	C9	7.71
Decanes	C10	8.83
Undecanes	C11	7.53
Dodecanes	C12	6.23
Tridecanes	C13	7.09
Tetradecanes	C14	6.85
Pentadecanes	C15	7.47
Hexadecanes	C16	5.92
Heptadecanes	C17	6.64
Octadecanes	C18	4.80
Nonadecanes	C19	3.69
Eicosanes	C20	3.17
Heneicosanes	C21	2.76
Docosanes	C22	1.86
Tricosanes	C23	1.58
Tetracosanes	C24	1.28
Pentacosanes	C25	0.91
Hexacosanes	C26	0.63
Heptacosanes	C27	0.43
Octacosanes	C28	0.22
Nonacosanes	C29	0.12
Triacontanes	C30	0.03
Hentriacontanes	C31	0.02
Dotriacontanes	C32	0.01
Tritriacontanes	C33	0.00
Tetratriacontanes	C34	0.00
Pentatriacontanes Plus	C35+	0.00
TOTAL		100.00

Molecular Weight Calculated *	:	188.1
Density @ 60 °F Calculated *	:	0.8213
Molecular Weight Measured	:	--
Density @ 60 °F Measured	:	0.8104

*Calculation based on generalized properties as published by Katz and Firoozabadi

FINGERPRINT ANALYSIS
BY CAPILLARY GAS CHROMATOGRAPHY
On Stock Tank Oil from atmospheric flash of sample in cylinder # L 405



DISTILLATION OF STOCK TANK LIQUID SAMPLE

(Hexanes to Dodecanes Plus)

Flashed from Fluid in Cylinder # L 405

C6 PLUS PROPERTIES OF STOCK TANK LIQUID

		Cut (°C)	Mol %	Molecular Weight	Weight %	Volume %	Density (gm/cc)	API Gravity
Hexanes	C6	59 - 84	1.48	88.3	0.68	0.80	0.6921	72.8
Heptanes	C7	85 - 112	3.82	101.7	2.02	2.31	0.7103	67.5
Octanes	C8	113 - 138	7.26	115.5	4.36	4.87	0.7259	63.2
Nonanes	C9	139 - 162	9.70	127.6	6.44	7.07	0.7385	59.9
Decanes	C10	163 - 185	10.57	143.7	7.91	8.46	0.7578	55.0
Undecanes	C11	186 - 206	7.65	162.7	6.48	6.74	0.7793	49.9
Dodecanes Plus	C12+	> 207	59.52	232.9	72.11	69.75	0.8386	37.1
	TOTAL		100.00		100.00	100.00		

C6 PLUS PROPERTIES OF RECOMBINED RESERVOIR FLUID

		Cut (°C)	Mol %	Molecular Weight	Weight %	Volume %	Density (gm/cc)	API Gravity
Hexanes	C6	59 - 84	1.82	87.4	0.65	0.77	0.6907	73.2
Heptanes	C7	85 - 112	4.10	101.2	1.70	1.95	0.7112	67.3
Octanes	C8	113 - 138	7.34	115.3	3.45	3.88	0.7263	63.1
Nonanes	C9	139 - 162	9.67	127.5	5.03	5.56	0.7387	59.9
Decanes	C10	163 - 185	10.49	143.7	6.14	6.62	0.7578	55.0
Undecanes	C11	186 - 206	7.59	162.6	5.04	5.28	0.7793	49.9
Dodecanes Plus	C12+	> 207	58.99	232.9	77.99	75.94	0.8386	37.1
	TOTAL		100.00		100.00	100.00		

PETROLAB

COMPOSITIONAL ANALYSIS OF BOTTOM HOLE RESERVOIR FLUID

Cylinder # L 405 ex MPSR (450 cc chamber) # 1178 - Transfer Sample 3

Component		Stock Tank Liquid Mol %	Stock Tank Gas Mol %	Reservoir Fluid Mol %
Hydrogen Sulphide	H2S	0.00	0.00	0.00
Carbon Dioxide	CO2	0.00	0.01	0.00
Nitrogen	N2	0.00	3.28	0.22
Methane	C1	0.53	88.78	6.47
Ethane	C2	0.13	3.64	0.37
Propane	C3	0.30	2.19	0.42
Iso-Butane	iC4	0.22	0.62	0.24
N-Butane	nC4	0.18	0.35	0.19
Iso-Pentane	iC5	0.33	0.24	0.32
N-Pentane	nC5	0.19	0.11	0.19
Hexanes	C6	1.45	0.29	1.37
Heptanes	C7	3.75	0.26	3.51
Octanes	C8	7.12	0.12	6.65
Nonanes	C9	9.52	0.06	8.88
Decanes	C10	10.37	0.02	9.67
Undecanes	C11	7.51	0.02	7.00
Dodecanes Plus	C12+	58.40	0.01	54.50
TOTAL		100.00	100.00	100.00

Ratios

Molar Ratio	:	0.9327	0.0673	1.0000
Mass Ratio	:	0.9929	0.0071	1.0000
Liquid Ratio (bbl/bbl)	:	1.0000 @ SC	--	1.0632 @ PT*
Gas Liquid Ratio	:	1.0000 bbl @ SC	41 SCF	--

Stream Properties

Molecular Weight	:	189.5	18.81	178.0
Density obs. (gm/cc)	:	0.8090 @ 60 °F	--	0.7664 @ PT*
Gravity (AIR = 1.000)	:	43.2 °API @ 60 °F	0.651	53.0
GHV (BTU/scf)	:	--	1110	--

Hexanes Plus Properties

Mol %	:	98.12	0.78	91.58
Molecular Weight	:	192.2	98.4	192.2
Density (gm/cc @ 60 °F)	:	0.8111	0.6870	0.8110
Gravity (°API @ 60 °F)	:	42.8	74.3	42.8

Heptanes Plus Properties

Mol %	:	96.67	0.49	90.21
Molecular Weight	:	193.8	106.9	193.8
Density (gm/cc @ 60 °F)	:	0.8120	0.6979	0.8120
Gravity (°API @ 60 °F)	:	42.6	71.1	42.6

Decanes Plus Properties

Mol %	:	76.28	0.05	71.17
Molecular Weight	:	213.9	146.4	213.9
Density (gm/cc @ 60 °F)	:	0.8258	0.7395	0.8258
Gravity (°API @ 60 °F)	:	39.7	59.7	39.7

Undecanes Plus Properties

Mol %	:	65.91	0.03	61.50
Molecular Weight	:	224.9	154.6	224.9
Density (gm/cc @ 60 °F)	:	0.8334	0.7467	0.8334
Gravity (°API @ 60 °F)	:	38.1	57.8	38.1

Dodecanes Plus Properties

Mol %	:	58.40	0.01	54.50
Molecular Weight	:	232.9	169.8	232.9
Density (gm/cc @ 60 °F)	:	0.8386	0.7591	0.8386
Gravity (°API @ 60 °F)	:	37.1	54.7	37.1

* (P)ressure : 216 psig * (T)emperature : 153 °F

CONSTANT MASS STUDY
@ 153 °F
Using Bottom Hole Reservoir Fluid in Cylinder # L-405

Pressure (psig)		Relative Volume (V/Vsat) (1)	Oil Compressibility (x10^-6)(psig^-1) (2)	Y Function (psig^-1) (3)	Thermal Expansion (x10^-4)(°F^-1) (4)	Oil Viscosity (Centipoise) (4)
3000		0.9771	6.56		4.06	1.64
2500		0.9805	6.94		4.16	1.57
1924	* *	0.9847	7.40		4.27	1.50
1500		0.9880	7.88		4.38	1.45
1000		0.9923	8.58		4.53	1.38
750		0.9945	9.00		4.62	1.35
500		0.9969	9.60		4.72	1.32
216	*	1.0000	10.80		4.87	1.28
215		1.0026		1.78		1.28
210		1.0155		1.84		1.29
200		1.0376		2.13		1.29
180		1.0901		2.22		1.30
160		1.1620		2.16		1.31
140		1.2583		2.10		1.32
120		1.3922		2.04		1.33
100		1.5859		1.98		1.34
80		1.8854		1.92		1.36
60		2.3978		1.86		1.37
40		3.4581		1.79		1.39
0						1.46

* Saturation Pressure

* * Reservoir Pressure

(1) Barrels at indicated pressure per barrel at saturation pressure
(2) Oil Compressibility = - (1/V) * (dV/dP)
(3) Y Function = (Psat - P) / (P)*(V/Vsat-1)
(4) Thermal Expansion = - (1/V) * (dV/dT)

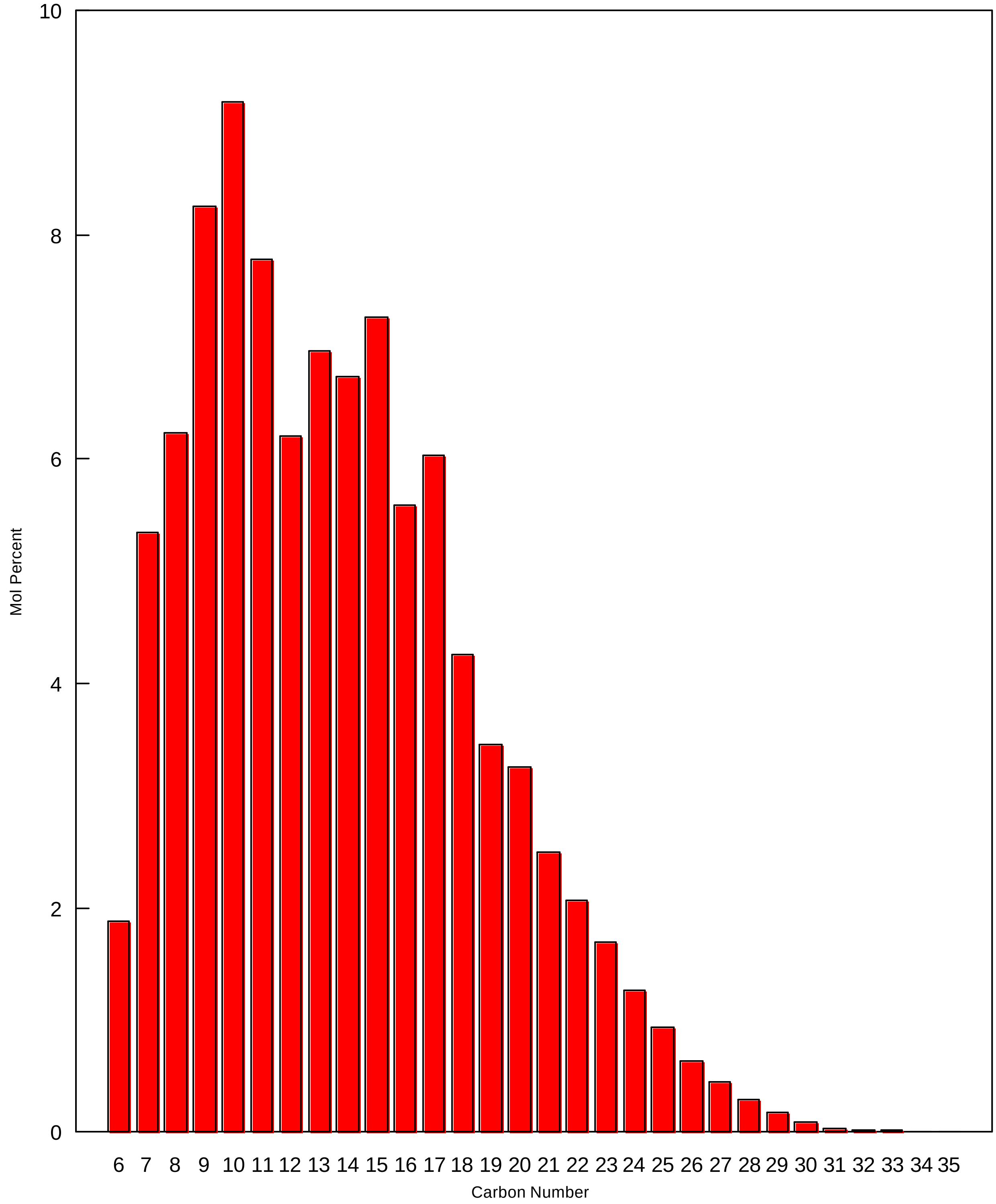
FINGERPRINT ANALYSIS
BY CAPILLARY GAS CHROMATOGRAPHY
On Stock Tank Oil from atmospheric flash of sample in cylinder # L 405

Component		Mol %
Hexanes minus	C6-	1.39
Hexanes	C6	1.88
Heptanes	C7	5.35
Octanes	C8	6.24
Nonanes	C9	8.26
Decanes	C10	9.19
Undecanes	C11	7.78
Dodecanes	C12	6.21
Tridecanes	C13	6.97
Tetradecanes	C14	6.74
Pentadecanes	C15	7.27
Hexadecanes	C16	5.59
Heptadecanes	C17	6.04
Octadecanes	C18	4.25
Nonadecanes	C19	3.45
Eicosanes	C20	3.26
Heneicosanes	C21	2.49
Docosanes	C22	2.06
Tricosanes	C23	1.69
Tetracosanes	C24	1.27
Pentacosanes	C25	0.93
Hexacosanes	C26	0.63
Heptacosanes	C27	0.44
Octacosanes	C28	0.29
Nonacosanes	C29	0.17
Triacontanes	C30	0.09
Hentriacontanes	C31	0.03
Dotriacontanes	C32	0.02
Tritriacontanes	C33	0.02
Tetratriacontanes	C34	0.00
Pentatriacontanes Plus	C35+	0.00
TOTAL		100.00

Molecular Weight Calculated *	:	186.6
Density @ 60 °F Calculated *	:	0.8204
Molecular Weight Measured	:	--
Density @ 60 °F Measured	:	0.8102

*Calculation based on generalized properties as published by Katz and Firoozabadi

FINGERPRINT ANALYSIS
BY CAPILLARY GAS CHROMATOGRAPHY
On Stock Tank Oil from atmospheric flash of sample in cylinder # L 405



COMPOSITIONAL ANALYSIS OF BOTTOM HOLE RESERVOIR FLUID

Flashed hot from PVT cell after CMS Study

Cylinder # L 405 ex MPSR (450 cc chamber) # 1178 - Transfer Sample 3

Component		Stock Tank Liquid Mol %	Stock Tank Gas Mol %	Reservoir Fluid Mol %
Hydrogen Sulphide	H2S	0.00	0.00	0.00
Carbon Dioxide	CO2	0.00	0.15	0.01
Nitrogen	N2	0.00	2.90	0.22
Methane	C1	0.40	86.77	6.77
Ethane	C2	0.08	4.11	0.38
Propane	C3	0.17	2.71	0.36
Iso-Butane	iC4	0.12	0.80	0.17
N-Butane	nC4	0.11	0.56	0.15
Iso-Pentane	iC5	0.19	0.38	0.20
N-Pentane	nC5	0.12	0.20	0.13
Hexanes	C6	1.46	0.53	1.39
Heptanes	C7	3.77	0.46	3.53
Octanes	C8	7.17	0.24	6.66
Nonanes	C9	9.58	0.13	8.89
Decanes	C10	10.44	0.05	9.68
Undecanes	C11	7.56	0.01	7.00
Dodecanes Plus	C12+	58.81	0.00	54.46
TOTAL		100.00	100.00	100.00

Ratios

		Stock Tank Liquid	Stock Tank Gas	Reservoir Fluid
Molar Ratio	:	0.9263	0.0737	1.0000
Mass Ratio	:	0.9918	0.0082	1.0000
Liquid Ratio (bbl/bbl)	:	1.0000 @ SC	--	1.0369 @ PT*
Gas Liquid Ratio	:	1.0000 bbl @ SC	45 SCF	--

Stream Properties

		Stock Tank Liquid	Stock Tank Gas	Reservoir Fluid
Molecular Weight	:	190.4	19.82	177.9
Density obs. (gm/cc)	:	0.8098 @ 60 °F	--	0.7874 @ PT*
Gravity (AIR = 1.000)	:	43.1 °API @ 60 °F	0.686	48.0
GHV (BTU/scf)	:	--	1167	--

Hexanes Plus Properties

		Stock Tank Liquid	Stock Tank Gas	Reservoir Fluid
Mol %	:	98.80	1.42	91.61
Molecular Weight	:	192.2	97.4	192.1
Density (gm/cc @ 60 °F)	:	0.8111	0.6856	0.8110
Gravity (°API @ 60 °F)	:	42.8	74.7	42.8

Heptanes Plus Properties

		Stock Tank Liquid	Stock Tank Gas	Reservoir Fluid
Mol %	:	97.34	0.89	90.22
Molecular Weight	:	193.8	105.3	193.7
Density (gm/cc @ 60 °F)	:	0.8120	0.6960	0.8120
Gravity (°API @ 60 °F)	:	42.6	71.6	42.6

Decanes Plus Properties

		Stock Tank Liquid	Stock Tank Gas	Reservoir Fluid
Mol %	:	76.81	0.06	71.14
Molecular Weight	:	213.9	136.1	213.9
Density (gm/cc @ 60 °F)	:	0.8259	0.7299	0.8258
Gravity (°API @ 60 °F)	:	39.7	62.2	39.7

Undecanes Plus Properties

		Stock Tank Liquid	Stock Tank Gas	Reservoir Fluid
Mol %	:	66.37	0.01	61.46
Molecular Weight	:	224.9	146.9	224.9
Density (gm/cc @ 60 °F)	:	0.8334	0.7399	0.8334
Gravity (°API @ 60 °F)	:	38.1	59.6	38.1

Dodecanes Plus Properties

		Stock Tank Liquid	Stock Tank Gas	Reservoir Fluid
Mol %	:	58.81	0.00	54.46
Molecular Weight	:	232.9	--	232.9
Density (gm/cc @ 60 °F)	:	0.8386	--	0.8386
Gravity (°API @ 60 °F)	:	37.1	--	37.1

* (P)ressure : 5000 psig * (T)emperature : 153 °F

RELATIVE VOLUME

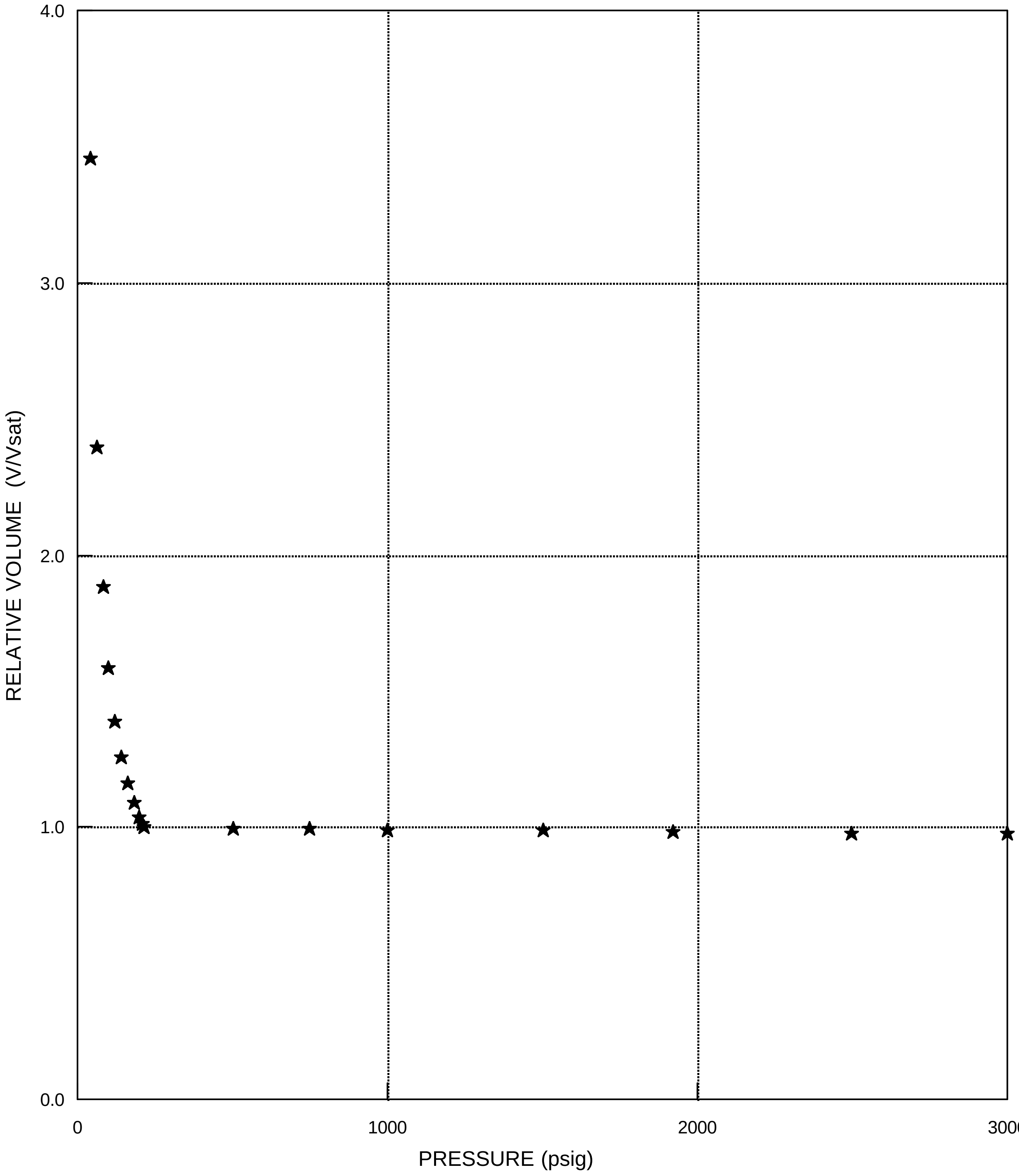
Equation of best fit

ABOVE Psat

RV = +1.00E+00 -1.21E-05 * P +2.42E-09 * P^2 -6.15E-13 * P^3 +7.20E-17 * P^4

BELOW Psat

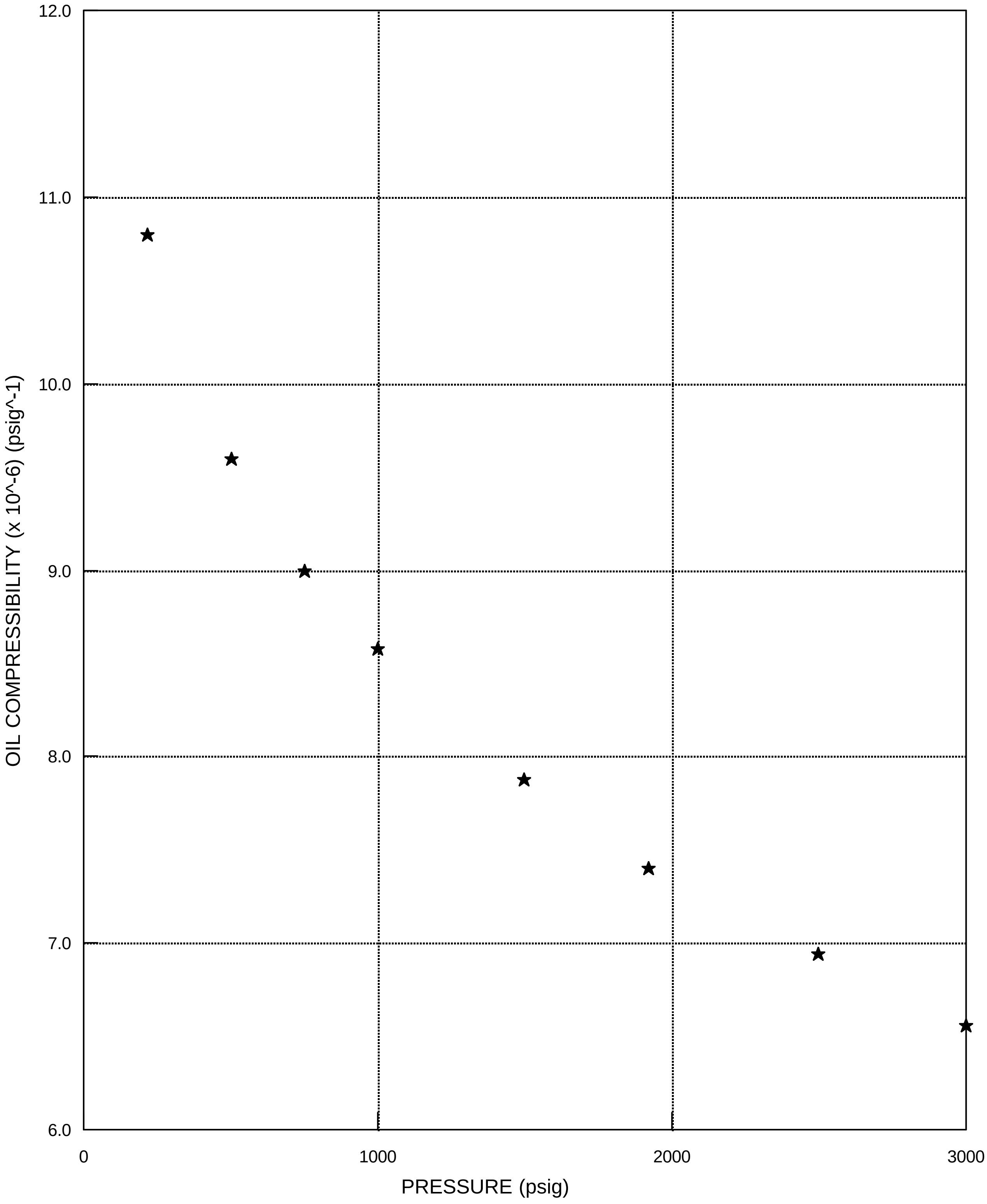
RV = +7.58E+00 +-1.51E-01 * P +1.42E-03 * P^2 +-6.13E-06 * P^3 +9.90E-09 * P^4



OIL COMPRESSIBILITY

Equation of best fit

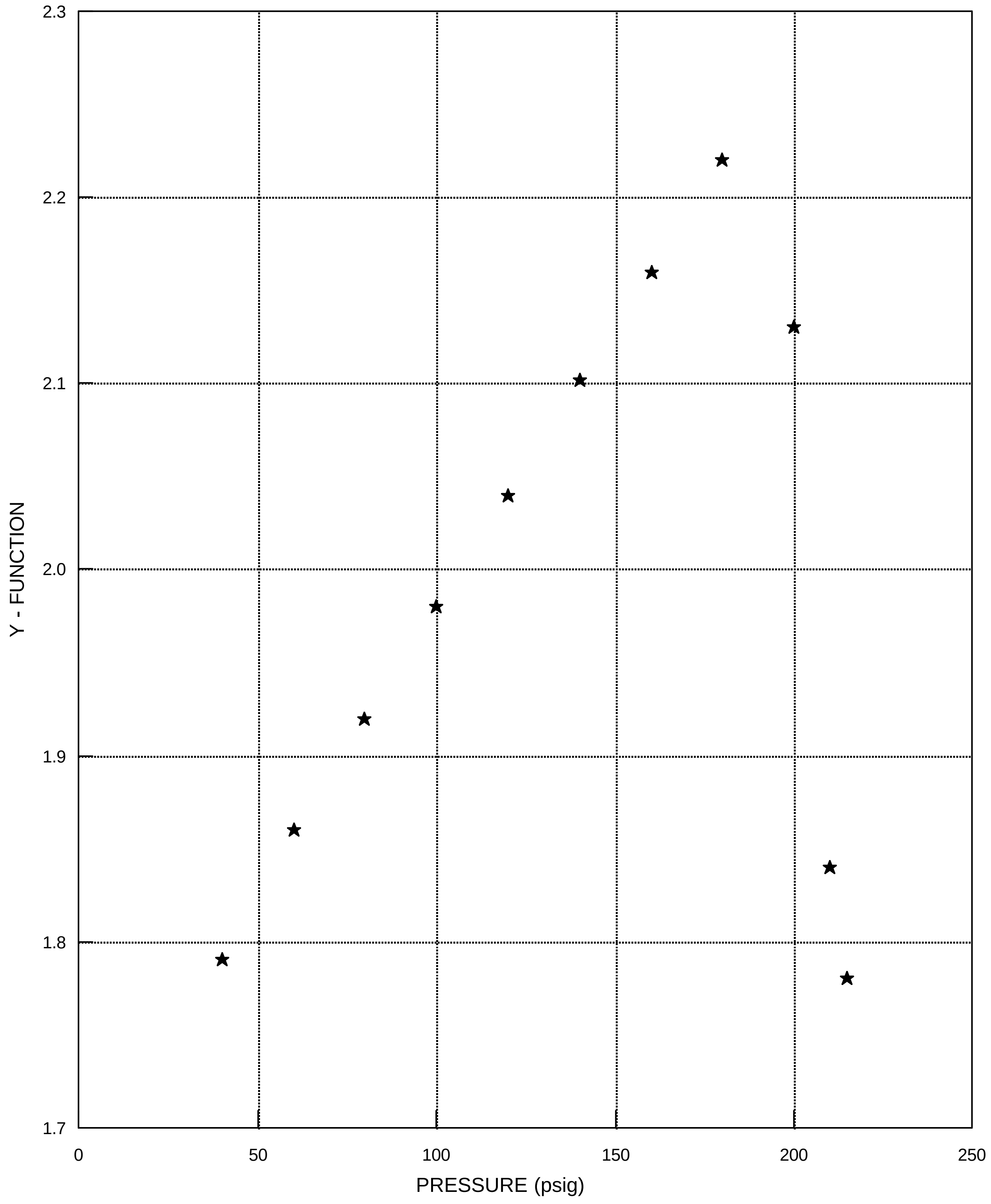
Co = +1.19E+01 -6.17E-03 * P +3.89E-06 * P^2 -1.29E-09 * P^3 +1.61E-13 * P^4



Y - FUNCTION

Equation of best fit

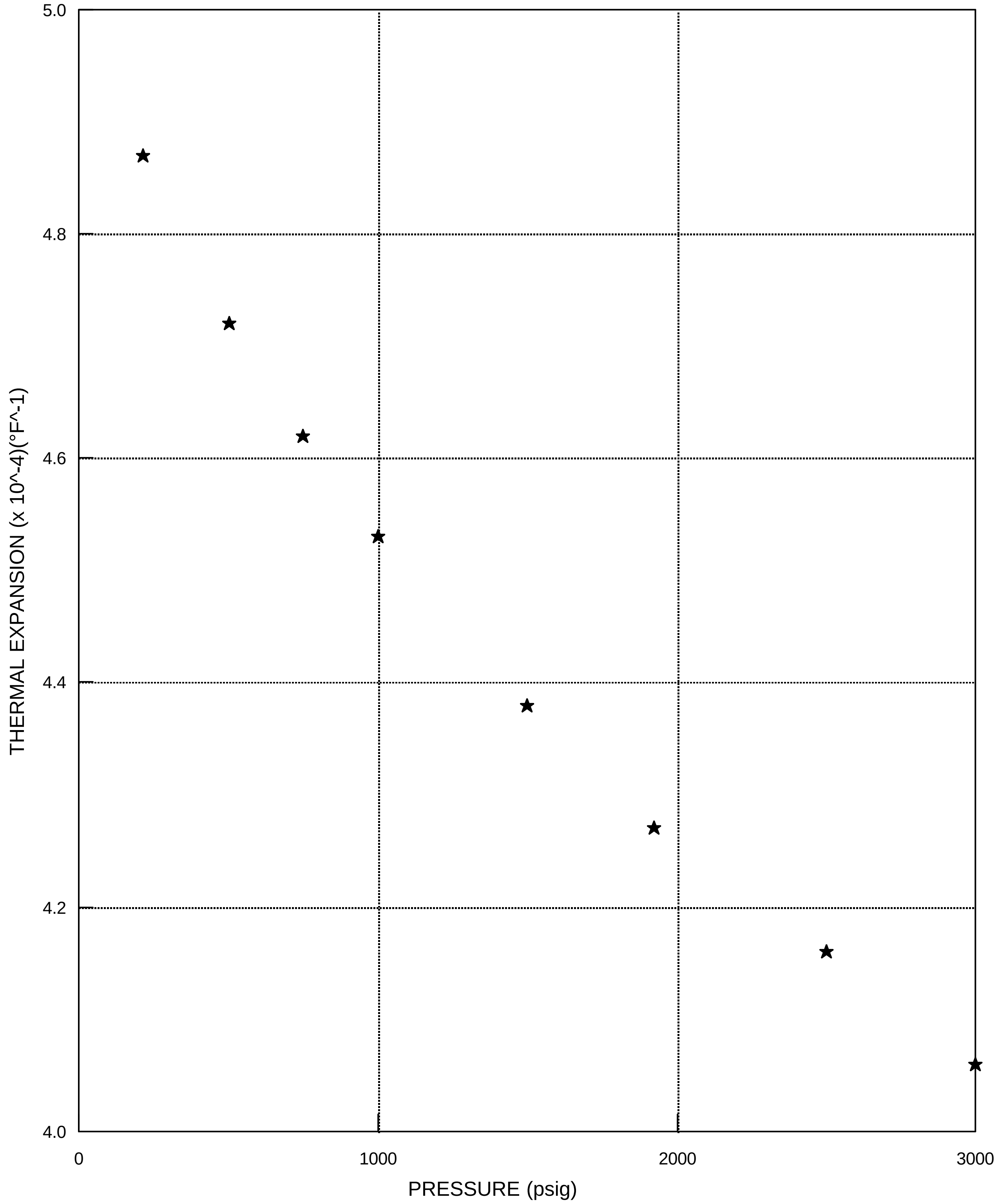
Y = +1.67E+00 +3.09E-03 * P



OIL THERMAL EXPANSION

Equation of best fit

TE = +4.99E+00 -6.25E-04 * P +1.92E-07 * P^2 -3.70E-11 * P^3 +2.60E-15 * P^4



OIL VISCOSITY

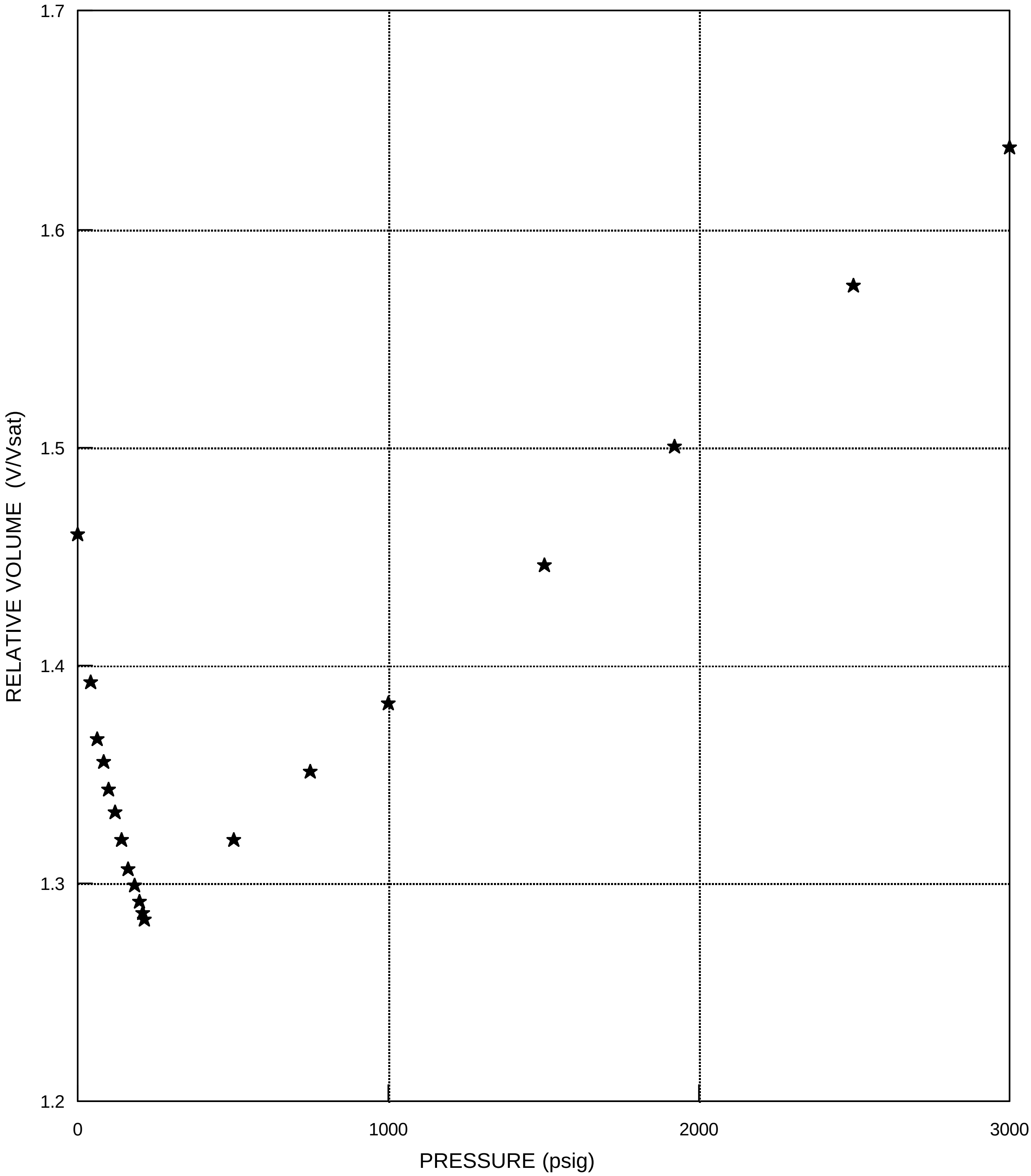
Equation of best fit

ABOVE Psat

$\mu o = +1.26E+00 \; +1.29E-04 * P \; -5.77E-09 * P^2 \; +3.45E-12 * P^3 \; -5.92E-16 * P^4$

BELOW Psat

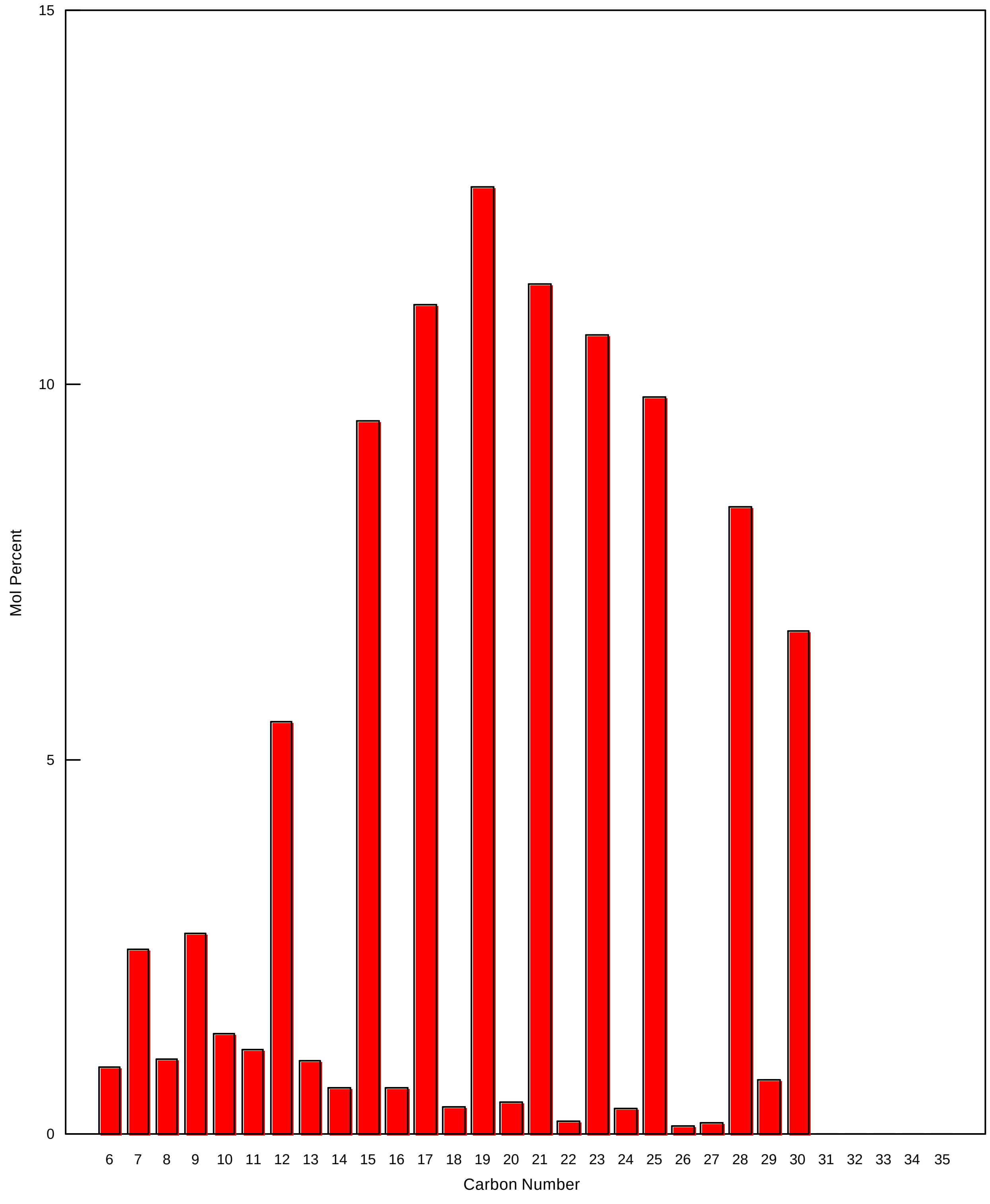
$\mu o = +1.47E+00 \; +-2.74E-03 * P \; +2.48E-05 * P^2 \; +-1.22E-07 * P^3 \; +2.21E-10 * P^4$



FINGERPRINT ANALYSIS
BY CAPILLARY GAS CHROMATOGRAPHY
On Extracted Oil from Cuttings of Depth 1405-1410 mMD

Component		Mol %
Hexanes minus	C6-	0.24
Hexanes	C6	0.89
Heptanes	C7	2.47
Octanes	C8	1.00
Nonanes	C9	2.69
Decanes	C10	1.35
Undecanes	C11	1.14
Dodecanes	C12	5.50
Tridecanes	C13	0.98
Tetradecanes	C14	0.62
Pentadecanes	C15	9.52
Hexadecanes	C16	0.63
Heptadecanes	C17	11.08
Octadecanes	C18	0.36
Nonadecanes	C19	12.64
Eicosanes	C20	0.44
Heneicosanes	C21	11.35
Docosanes	C22	0.18
Tricosanes	C23	10.67
Tetracosanes	C24	0.34
Pentacosanes	C25	9.83
Hexacosanes	C26	0.11
Heptacosanes	C27	0.16
Octacosanes	C28	8.38
Nonacosanes	C29	0.72
Triacontanes	C30	6.71
Hentriacontanes	C31	0.00
Dotriacontanes	C32	0.00
Tritriacontanes	C33	0.00
Tetratriacontanes	C34	0.00
Pentatriacontanes Plus	C35+	0.00
TOTAL		100.00

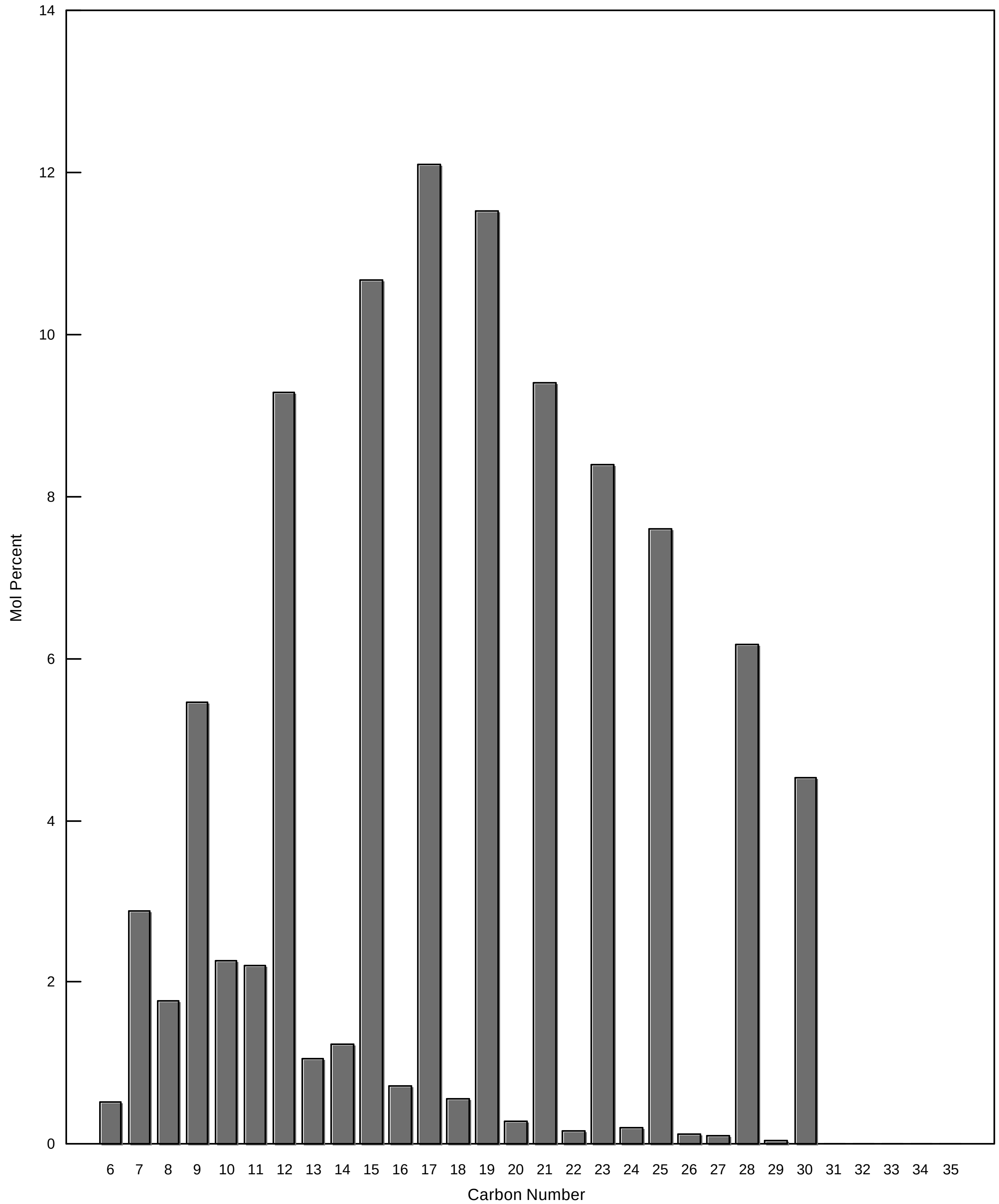
FINGERPRINT ANALYSIS
BY CAPILLARY GAS CHROMATOGRAPHY
On Extracted Oil from atmospheric flash of sample in cylinder # 1405-1410 mMD



FINGERPRINT ANALYSIS
BY CAPILLARY GAS CHROMATOGRAPHY
On Extracted Oil from Cuttings of Depth 1410-1415 mMD

Component		Mol %
Hexanes minus	C6-	0.75
Hexanes	C6	0.52
Heptanes	C7	2.89
Octanes	C8	1.77
Nonanes	C9	5.45
Decanes	C10	2.27
Undecanes	C11	2.20
Dodecanes	C12	9.28
Tridecanes	C13	1.05
Tetradecanes	C14	1.23
Pentadecanes	C15	10.67
Hexadecanes	C16	0.72
Heptadecanes	C17	12.09
Octadecanes	C18	0.57
Nonadecanes	C19	11.52
Eicosanes	C20	0.28
Heneicosanes	C21	9.41
Docosanes	C22	0.17
Tricosanes	C23	8.40
Tetracosanes	C24	0.20
Pentacosanes	C25	7.59
Hexacosanes	C26	0.12
Heptacosanes	C27	0.11
Octacosanes	C28	6.17
Nonacosanes	C29	0.05
Triacontanes	C30	4.52
Hentriacontanes	C31	0.00
Dotriacontanes	C32	0.00
Tritriacontanes	C33	0.00
Tetratriacontanes	C34	0.00
Pentatriacontanes Plus	C35+	0.00
TOTAL		100.00

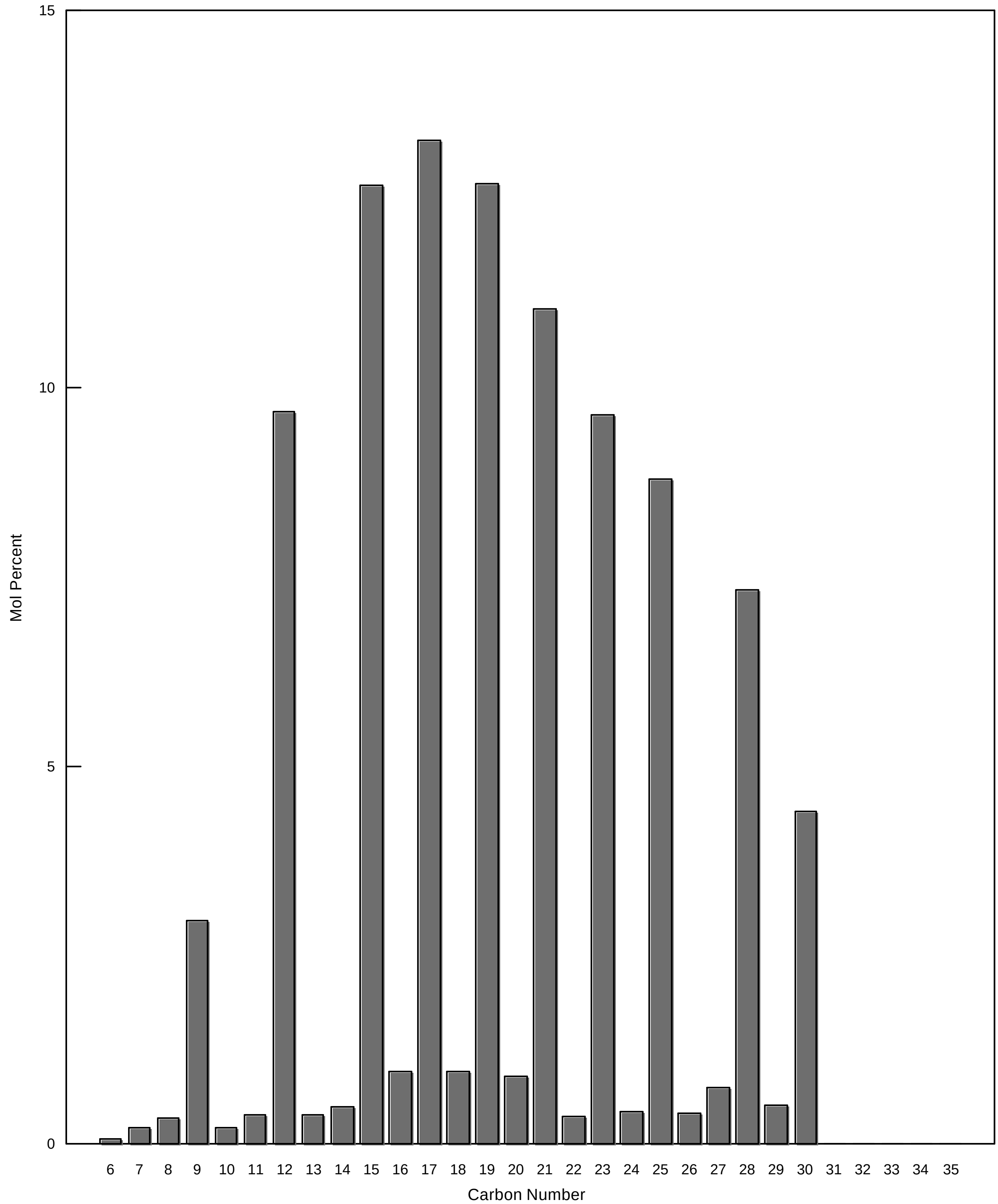
FINGERPRINT ANALYSIS
BY CAPILLARY GAS CHROMATOGRAPHY
On Extracted Oil from atmospheric flash of sample in cylinder # 1410-1415 mMD



FINGERPRINT ANALYSIS
BY CAPILLARY GAS CHROMATOGRAPHY
On Extracted Oil from Cuttings of Depth 1425-1430 mMD

Component		Mol %
Hexanes minus	C6-	0.00
Hexanes	C6	0.08
Heptanes	C7	0.23
Octanes	C8	0.35
Nonanes	C9	2.96
Decanes	C10	0.21
Undecanes	C11	0.39
Dodecanes	C12	9.69
Tridecanes	C13	0.39
Tetradecanes	C14	0.49
Pentadecanes	C15	12.69
Hexadecanes	C16	0.96
Heptadecanes	C17	13.28
Octadecanes	C18	0.96
Nonadecanes	C19	12.70
Eicosanes	C20	0.89
Heneicosanes	C21	11.05
Docosanes	C22	0.37
Tricosanes	C23	9.65
Tetracosanes	C24	0.44
Pentacosanes	C25	8.81
Hexacosanes	C26	0.42
Heptacosanes	C27	0.74
Octacosanes	C28	7.33
Nonacosanes	C29	0.52
Triacontanes	C30	4.40
Hentriacontanes	C31	0.00
Dotriacontanes	C32	0.00
Tritriacontanes	C33	0.00
Tetratriacontanes	C34	0.00
Pentatriacontanes Plus	C35+	0.00
TOTAL		100.00

FINGERPRINT ANALYSIS
BY CAPILLARY GAS CHROMATOGRAPHY
On Extracted Oil from atmospheric flash of sample in cylinder # 1425-1430 mMD



APPENDIX 6

ON-SITE FLUID TRANSFERS

FIELD TRANSFER DETAILS

OF RESERVOIR FLUID SAMPLED @ 1412.5 mRT

@ 5000 psig & 18 °C

Schlumberger Sample ID No.	Sampled in Schlumberger Chamber No.	Sample Volume Transferred (cc)	Transferred to Petrolab Cylinder No.
T.01	MPSR 0478	435	L-323
T.02	MPSR 0494	430	L-048
T.03	MPSR 1178	430	L-405
T.04	MPSR 1695	420	L-184
T.05	MPSR 1760	430	L-294
T.06			
T.06 - transfer 1	MRSC BB-19	600	L-163
T.06 - transfer 2	MRSC BB-19	600	L-092
T.06 - transfer 3	MRSC BB-19	600	L-428
T.06 - transfer 4	MRSC BB-19	600	L-139

Field Analyses on the 1 Gallon MRSC Chamber :

Density	0.8091 @ 60 ºF	43.2 API

H2S	< 0.1 ppm	< 0.1 ppm

Volumes recovered (ccs)

OIL	GAS	WATER
3250	30000	150

GOR (scf/bbl)	41	44

4 * 600 ccs were transferred into sample cylinders listed under T.06
850 ccs of stock tank oil and 150 ccs of water / mud filtrate were flashed off

APPENDIX 7

OPEN AND CASED HOLE SONIC PROCESSING REPORT

Open and Cased Hole DSI* Sonic Processing Report

Products:	•	MPS: Compressional Slowness
	•	UDP-LDP: Shear Slowness
Company:	•	ExxonMobil
Well(s):	•	West Whiptail-1
Interval:	•	1508 to 631m MD (877m)
Analysis Date:	•	September 24th, 2004
Logging Date:	•	May 20th, 2004
Location:	•	Schlumberger Data Services Centre
	•	Perth, Western Australia
Analyst(s):	•	Sylvia Tokic
Logging Engineer:	•	G.Ruthven

Prepared by:
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1 Executive Summary

The DSI* (Dipole Shear Sonic Imager tool with Upper Dipole (UDP), Lower Dipole (LDP) and Monopole (MPS) mode) logs were acquired in vertical exploration well West Whiptail-1 (Longitude 147° 30'17.167" East and Latitude 38° 19' 29.150" South) logged on the 20th of May 2004 and processed on the 24th of September, 2004.

The data was acquired in 8.5in open hole section, with water-based mud (KCL/PHPA/Glycol). Subsequently, the entire open hole interval was processed and analysed to obtain a continuous compressional and shear slowness. Only MPS mode was recorded for 9.625in cased hole. As the formation shear slowness is generally larger than the mud slowness, no shear slowness could be extracted from MPS in this cased hole section. However from 745.5 to 631m MD compressional slowness was extracted where coherence was fair. If dipole (UDP/LDP mode) was run within casing, extraction of shear slowness may have been possible.

Overall, open hole data quality was good. Based on the borehole condition, there were slight washout sections throughout the borehole and large intervals of washout sections above 1185m MD but this did not affect the BestDT 3* processed compressional results as the processing used DDBHC (Depth Derived Borehole Compensated) result, that is, compensated for borehole effects. Shear seemed to be slightly effected around washed out sections, with an increased uncertainty on results, for example, at 1465 and 1432m MD but overall, the data is reliable across most sections and has been significantly improved by BestDT 3* processing.

Overall, processing obtained a higher resolution data set and approximately an extra 100 m of compressional data within cased hole.

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2 Processing Result and Evaluation

2.1 Open Hole Upper Dipole (UDP) and Monopole P & S (MPS) Results

Compressional slowness was obtained from the MPS mode processing using both the Receiver and Transmitter Arrays and used to produce Depth Derived Borehole Compensated (DDBHC) final output. Processing used the latest BestDT-3* technique that is based on STC (Slowness Time Coherence) computation, on GeoQuest's GeoFrame 4.0.3 platform. The final DT compressional (DTCO) is therefore an average of DT output from receiver and transmitter array processing, and used in the computation of the Poisson's ratio and VpVs ratio on the final DSI presentation. **Figure 1** shows a section of the results for open hole. Using the DDBHC method corrects for any slight eccentralising and unfavourable borehole conditions such as small washouts, tool tilt and changes in borehole size

Shear curves were obtained from UDP and LDP Processing. The software then uses the resultant curve, which contains the most continuous STC curves. In this case, the UDP receiver array was used as it was the most consistent and coherent curve available from the dataset. BestDT-3* processing uses sophisticated dispersion correction to give a more accurate true formation shear slowness. This is based on using the entire waveform as opposed to part of a waveform and look up chart, which is used in the field. Refer to **Appendix 3** for theory and **Appendix 1** for mnemonics description.

Figure 2 shows the STC versus depth for the Upper Dipole. Note the strong and consistent coherence.

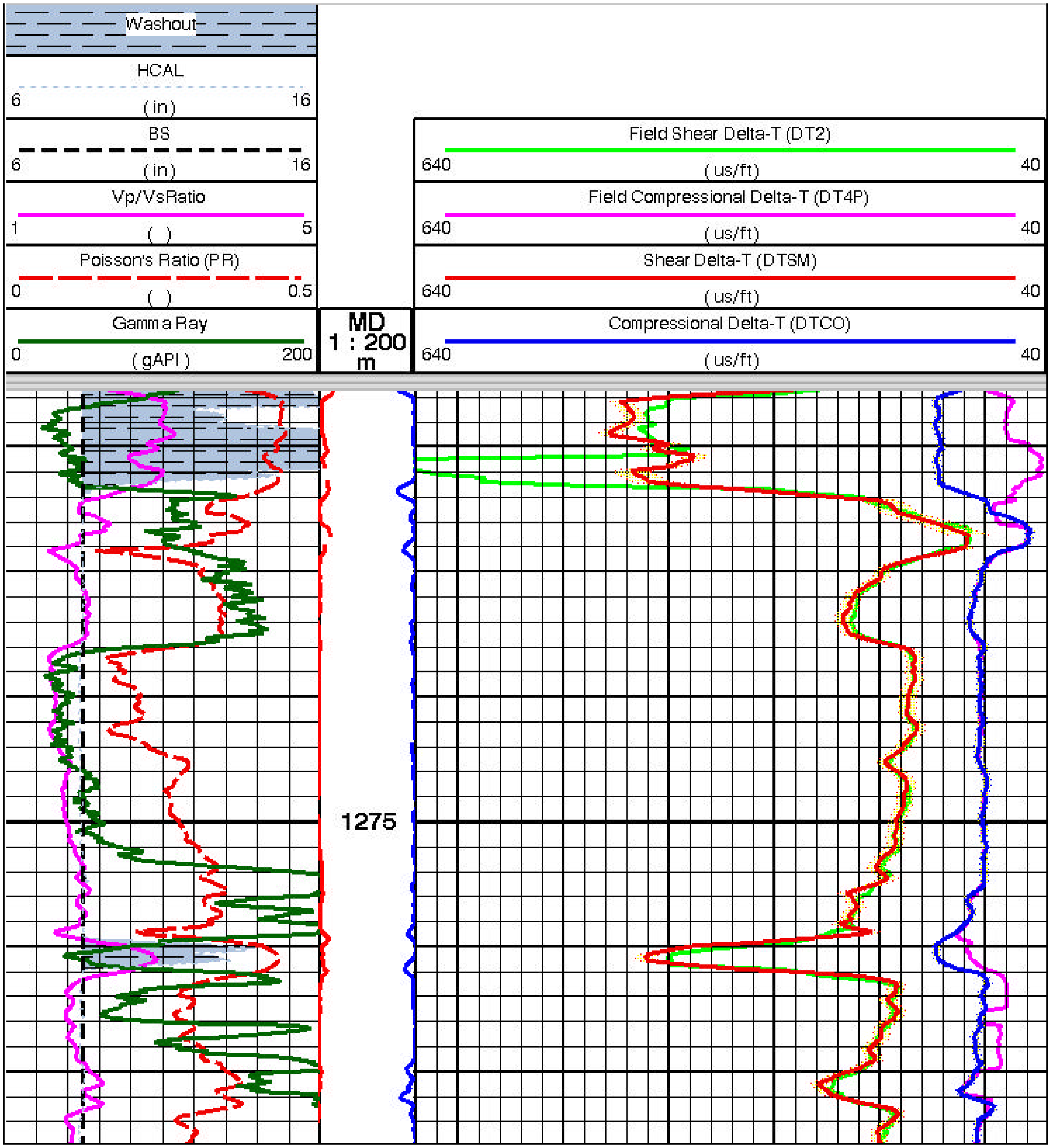


Figure 1: Open Hole Best DT-3* Results for part of the log

Track 1 shows GR, Poisson's Ratio and VpVS Ratio. The VpVs ratio tends towards 1.6 to 1.8 in the reservoir zones. See attached print for entire depth section. Track 1 also shows slight washout, which has not affected the quality of compressional logs but has increased the uncertainty for shear in some sections, for example, at 1465 and 1432m MD. The last track compares the BestDT-3* results to that of the field. Results indicate that field data was not 'picked' correctly and hence BestDT-3* processing provided a higher quality answer product.

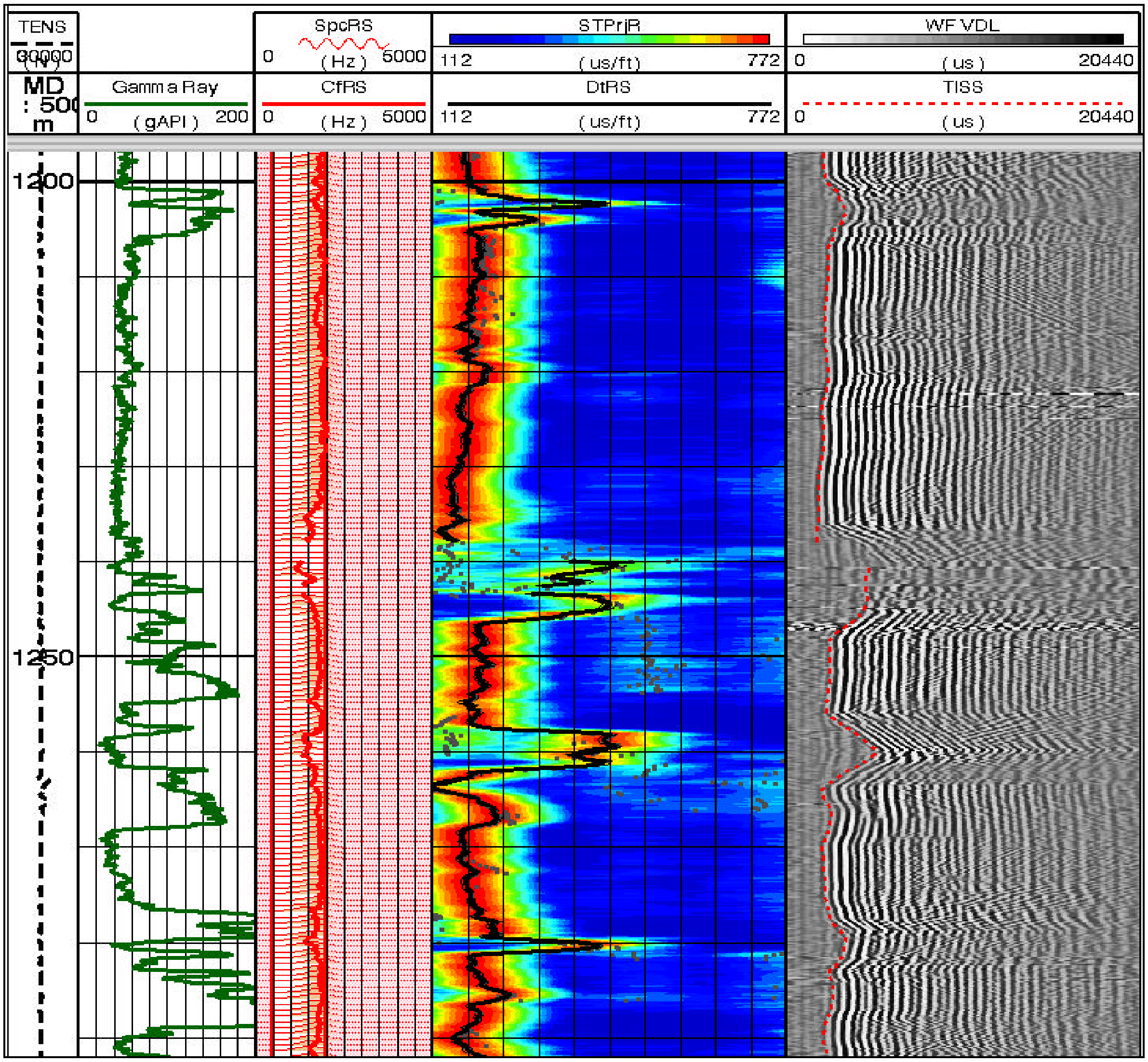


Figure 2: Open Hole UDP Quality Control for part log

Figure 2, representing the STC quality for open hole**,** shows that overall, output quality is good, shear arrivals were shown by strong coherency on both receiver and transmitter array.

Track 1 shows tension and track 2 shows the GR. Track 3 shows the shear curve and the frequency window, which the data was processed. The processing window in this example is 0.5 to 2 KHz. Track 4 shows the STC plane in relation to depth. In this example the shear is very coherent, represented here by a red band. Where the band is not red, the coherency is not as good. This occurs in the washed out sections (see **Figure 1** for washout). The software then selects the most coherent path by using a similar method to 'Tracking and Classification' as discussed in **Appendix 3** Track 5 represents the waveform in variable density log format (VDL). The TISS curve is the shear transit time. Note that the shear transit curve matches very well with the first formation arrivals, indicating good quality data whereby the STC semblance processing has detected the correct shear.

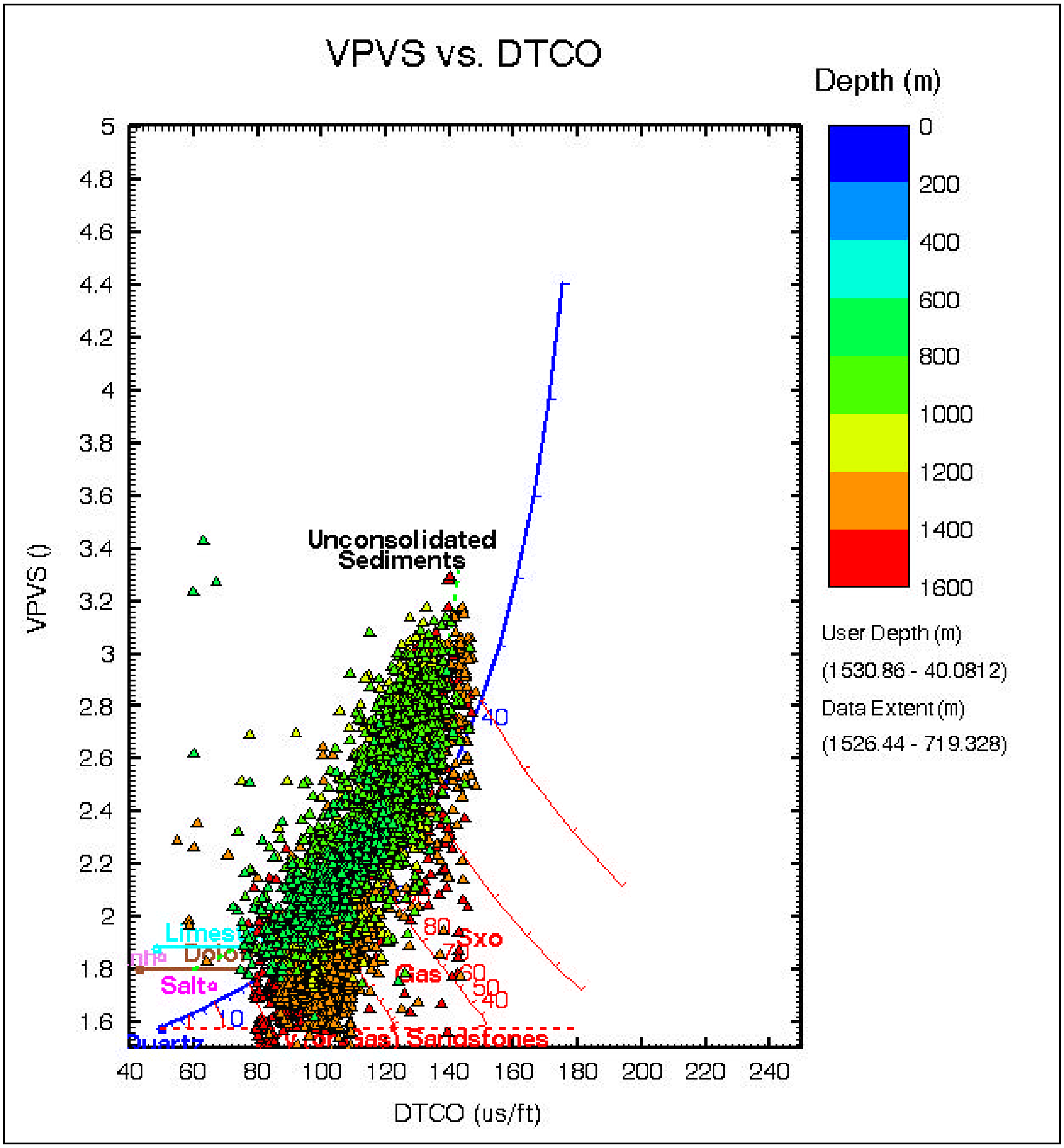


Figure 3: Display of DTCO versus VpVs ratio from (DSI shear and compressional curves)

Figure 3 shows VpVs ratio. The sands fall between 1.6 and 1.8.

2.2 *Cased Hole Monopole P & S (MPS) Results*

DDBHC was used to extract the cased hole compressional slowness. No dipole mode was acquired in cased hole therefore no shear slowness could be recorded. In this example, the BestDT-3* processing provided approximately 100m of compressional data which otherwise would not have been provided from field acquisition. In this case to get shear, a dipole (UDP & LDP mode) needs to be run in order to get formation shear as it is slower than the mud, therefore monopole (MPS mode) would not work. **Figure 4** compares the field data to the processed data showing the benefits of reprocessing. In this case, the BestDT-3* processing improved the compressional slowness. BestDT-3* also uses a more advanced processing technique than what is available on the MAXIS* field platform.

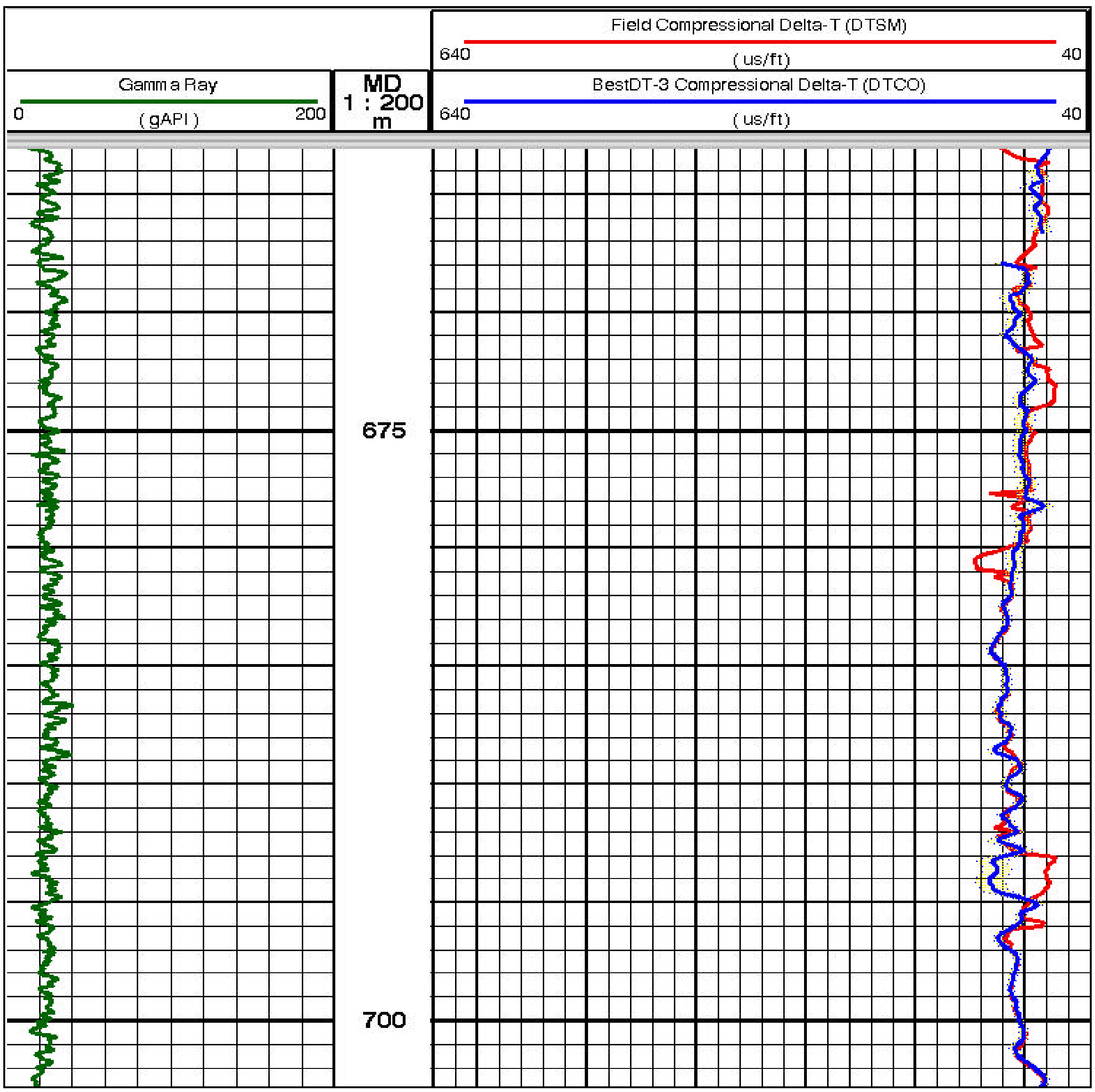


Figure 4: Cased Hole Best DT-3* Results for part of the log

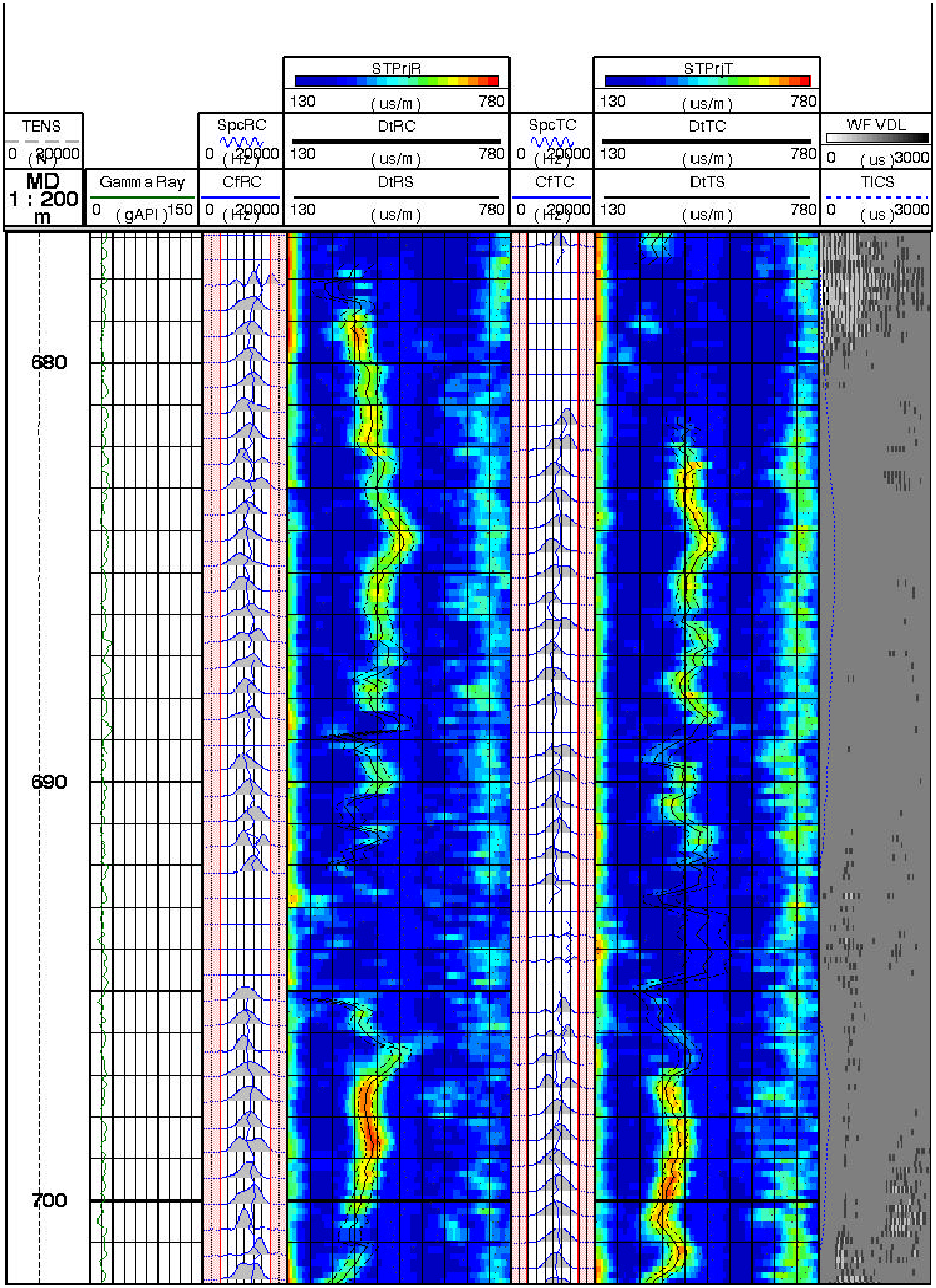


Figure 5: Cased Hole UDP Quality Control for part log

Figure 5 shows the slowness STC quality for cased hole MPS data. Output quality is variable, compressional arrivals were shown by fair coherency on both receiver and transmitter array.

Appendix 1: Mnemonics

CfRC	Coherency (Stacked Signal Center Frequency – Receiver Array)
CfTC	Coherency (Stacked Signal Center Frequency – Transmitter Array)
CHRP	Label peak coherence, receiver array – monopole.
CHR2	Label peak coherence, receiver array – upper dipole
CHTP	Label peak coherence, transmitter array – monopole
DDBHC	Depth derived borehole compensated
DT1	Delta-T Shear – Lower Dipole
DT2	Delta-T Shear – Upper Dipole
DT4P	Delta-T Compressional – Monopole P&S
DtRC	Delta-T Compressional – Receiver Array
DtRS	Delta-T Shear – Receiver Array
DtTC	Delta-T Compressional – Transmitter Array
DtTS	Delta-T Shear – Transmitter Array
DTCO –	Final BestDT-3* Delta-T Compressional Curve
DTSM	Final BestDT-3* Delta-T Shear Curve
LDP	Lower Dipole Mode
MPS –	Monopole P&S Mode
PR	Poisson's Ratio
REC	Receiver
SPcRC	Frequency Spectrum – Receiver Array
SPcTC	Frequency Spectrum – Transmitter Array
STPrjR	STC Slowness Projection – Receiver Array
STPrjT	STC Slowness Projection – Transmitter Array
TICS	Compressional Integrated Transit Time
TISS	Shear Integrated Transit Time
TENS	Tension
UDP	Upper Dipole Mode
VPVS	Ratio of Compressional Velocity to Shear Velocity

Appendix 2: Parameters

Table 1: Cased Hole MPS

Parameter	Value	Description
DTmud	215 us/ft	Mud Slowness
SFTY	Slow	Formation Type
HD	8 in	Hole diameter
CSIZ	9.625 in	Casing Size
BHS	Cased	Borehole Status
TWI	320 ms	Integrated Time Window
SLL	58	Slowness Lower Limit
SUL	200	Slowness Upper Limit
SST	2	Slowness Step
TLL	400	Time Lower Limit
TUL	4500	Time Upper Limit
TST	100	Time Step
SBW	2550	Search Band Width
SBO	150	Search Band Offset
SWD	20	Slowness Width
TWD	1800	Time Width
SEM	0.2	Semblance Threshold
FLENG	49	Filter Length
FLOW	4000	Filter Band Low
FHIGH	1600	Filter Band High

Table 2: Open Hole MPS

Parameter	Value	Description
DTmud	215 us/ft	Mud Slowness
SFTY	Slow	Formation Type
HD	8 in	Hole diameter
CSIZ	9.625 in	Casing Size
BHS	Open	Borehole Status
TWI	320 ms	Integrated Time Window
SLL	40	Slowness Lower Limit
SUL	240	Slowness Upper Limit
SST	2	Slowness Step
TLL	400	Time Lower Limit
TUL	4100	Time Upper Limit
TST	100	Time Step
SBW	2400	Search Band Width
SBO	360	Search Band Offset
SWD	20	Slowness Width
TWD	1800	Time Width

SEM	0.35	Semblance Threshold
FLENG	49	Filter Length
FLOW	4000	Filter Band Low
FHIGH	1600	Filter Band High

Table 3: Open Hole UDP

Parameter	Value	Description
DTmud SFTY	215 us/ft Slow	Mud Slowness Formation Type
HD	8 in	Hole diameter
CSIZ	9.625 in	Casing Size
BHS TWI	Open and Cased 2160 ms	Borehole Status Integration Time Window
SLL	112	Slowness Lower Limit
SUL	772	Slowness Upper Limit
SST TLL	4 1120	Slowness Step Time Lower Limit
TUL	16800	Time Upper Limit
TST	560	Time Step
SBW SBO	9400 2200	Search Band Width Search Band Offset
SWD	60	Slowness Width
TWD	7050	Time Width
SEM FLENG	0.35 71	Semblance Threshold Filter Length
FLOW	500	Filter Band Low
FHIGH	2000	Filter Band High

Appendix 3: Theory

Monopole P and S Mode (MPS)

A set of eight monopole sonic waveforms is shown in **Figure 6**. As expected the arrival time of the various arrivals in the waveforms increases with the transmitter-receiver spacing. The slope of a line drawn through the arrival of the same component at each waveform is called the move-out. It represents how much the arrival time is moving out as the distance from the transmitter increases. The moveout can be expressed in µsec/ft and actually represents the slowness of the wave component over the interval covered by the array.

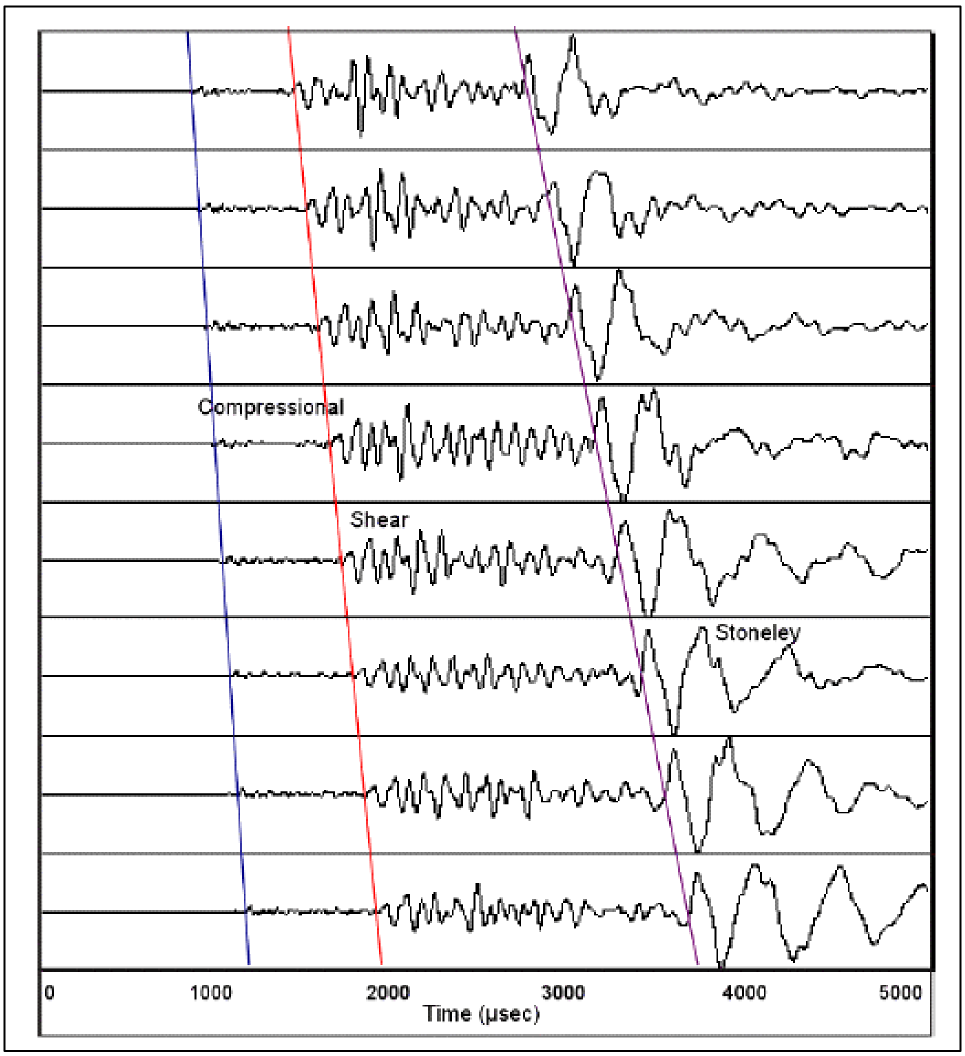


Figure 6: Move-out determination on a set of monopole array waveforms

Slowness time coherence processing, STC, is a processing technique based on semblance that performs this operation automatically. It searches for coherent components along all moveouts in a waveform array. We start by positioning a time window on the reference waveform at time T and then defining a corridor through the array with a move-out S (**Figure 7**). The total or incoherent energy, Ei, is calculated as the sum of the squares of the samples within the corridor (**Eq. 2-1**). The coherent energy, Ec, is then calculated as the arithmetic sum of the samples along the moveout squared (**Eq. 2-2**). When the signal on all waveforms within the window are perfectly correlated, the coherent energy is equal to the total energy times the number of waveforms.

$$E_i(T,S) = \sum_{i=1}^{n} \int_0^{Tw} [x_i(t - [T + S(z_i - z_1)])]^2 dt \quad (2\text{-}1)$$

$$E_c(T,S) = \int_0^{Tw} \left[\sum_{i=1}^{n} x_i(t - [T + S(z_i - z_1)]) \right]^2 dt \quad (2\text{-}2)$$

Where i is the waveform number, xi is the value of the waveform sample at time t ,Tw the length of the integration time window and zi the waveform depth.
The coherence is defined as:

$$Coh(T,S) = \frac{1}{n} \frac{E_c(T,S)}{E_i(T,S)} \quad (2\text{-}3)$$

The coherence varies between 0 and 1. A value of 0 means that there is no correlated arrival in the window. On the opposite, a value of 1 means that the waveform components in the window correlate perfectly.

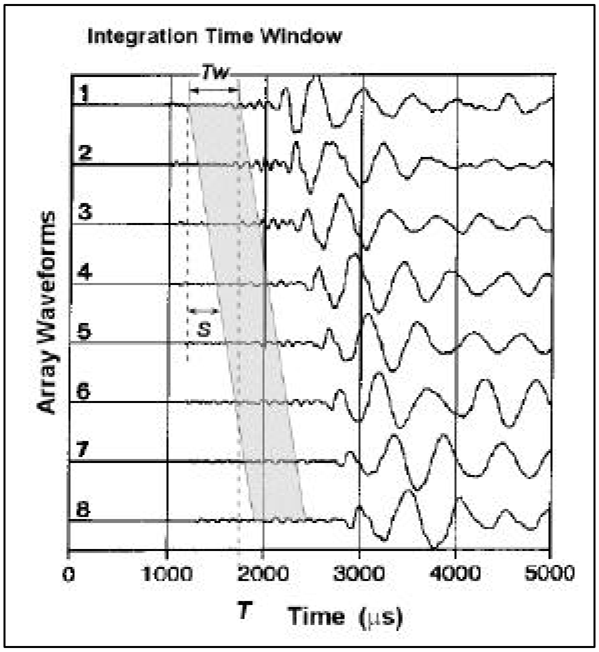
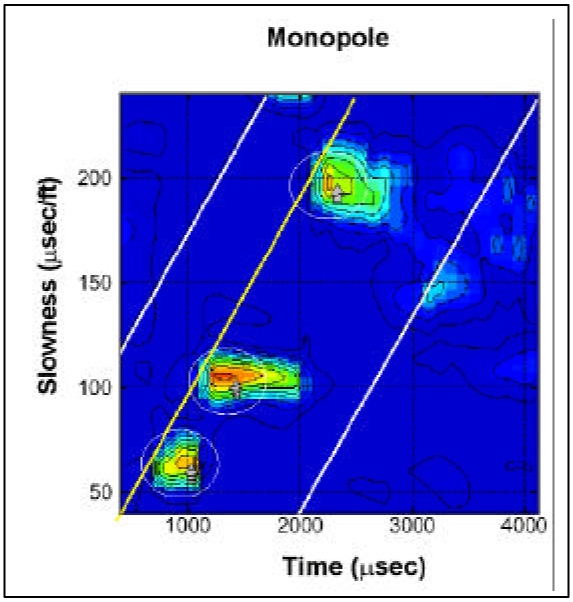


Figure 7: Slowness time coherence computation principle

The computation is done for a range of moveout S, for every possible position of the window in time T. A convenient representation of the coherence results is to display them on a contour plot versus time and slowness, the ST-Plane (**Figure. 8**). On such a plot each point represents the value of the coherence for a specific time and move out (slowness).

Coherence has a low value unless the integration corridor is positioned over a wave propagating at the considered moveout. Therefore, most of the ST plane is filled with coherence values close to 0 (blue). However, when a coherent arrival is present in the waveforms it shows as a peak of coherence with values that can go up to 1. The process locates the position of the maximum coherence at each peak and outputs the value of slowness, time and coherence in a list. For a given tool configuration, we expect that the time of arrival of a wave will be approximately the product of the slowness by the spacing between the transmitter and the reference receiver. This relation is represented on the plot by the TR line. The ST-plane shown on the example is from a set of monopole waveforms. The three main peaks observed, starting from bottom left, probably represent the compressional, the shear and the Stoneley arrivals. However, at this stage the peaks only represent coherent arrivals in the waveforms and are not identified. The process is repeated for each set of waveforms acquired by the tool at each depth sample.



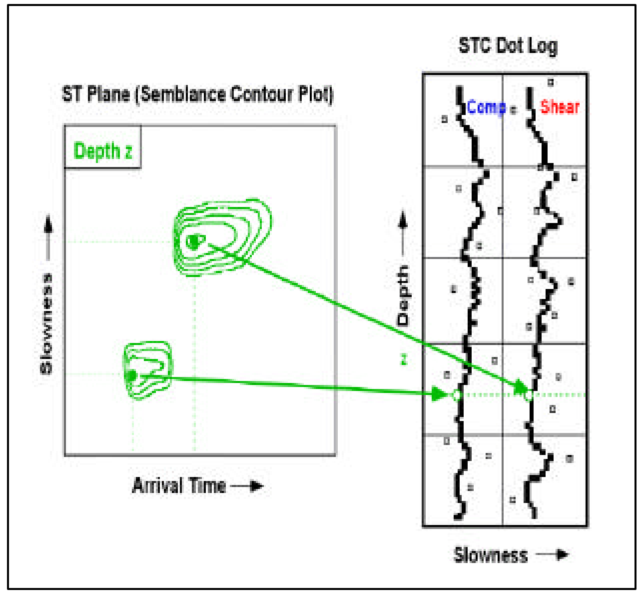


Figure 8: Slowness-Time Plane monopole example. Figure 9: Coherence peak labelling and slowness dot-logs generation

STC processing outputs a list of coherence peaks at every measurement depth. We can represent these peaks as dots on a slowness versus depth plot (**Figure 9**). On such a plot, coherent arrivals display as continuous series of dots. There may also be scattered coherence peaks caused by noise, bed boundaries or other spurious effects that do not match with continuous trends. 'Tracking and classification' identifies the peaks that belong to consistent arrivals versus depth, assigns them to a specific wave type, for example compressional or shear, and output the values in the form of a continuous slowness log. Tracking and classification uses rules to identify the different waves. Typical rules used by tracking and classification are that the peaks have sufficient continuity in depth, sufficient coherence, that the compressional is faster than the shear arrival and that the ratio of their respective slownesses is larger than 1.45.

Sometimes, dots are missing and there are gaps in the trends. These may originate among other causes from unfavourable borehole conditions, layering or noise. As long as the gap is small, tracking and classification interpolates in between existing peaks to obtain a continuous log, but if the gap is larger than a couple of feet, the log is set to absent.

Upper and Lower Dipole Mode (UDP & LDP)

A flexural wave is propagated through the borehole by inducing a pressure wave perpendicular to the borehole wall and propagates throughout the borehole wall. The borehole wall then experiences a transverse displacement as indicated in **Figure 10,** which is similar to the shear velocity of the formation.

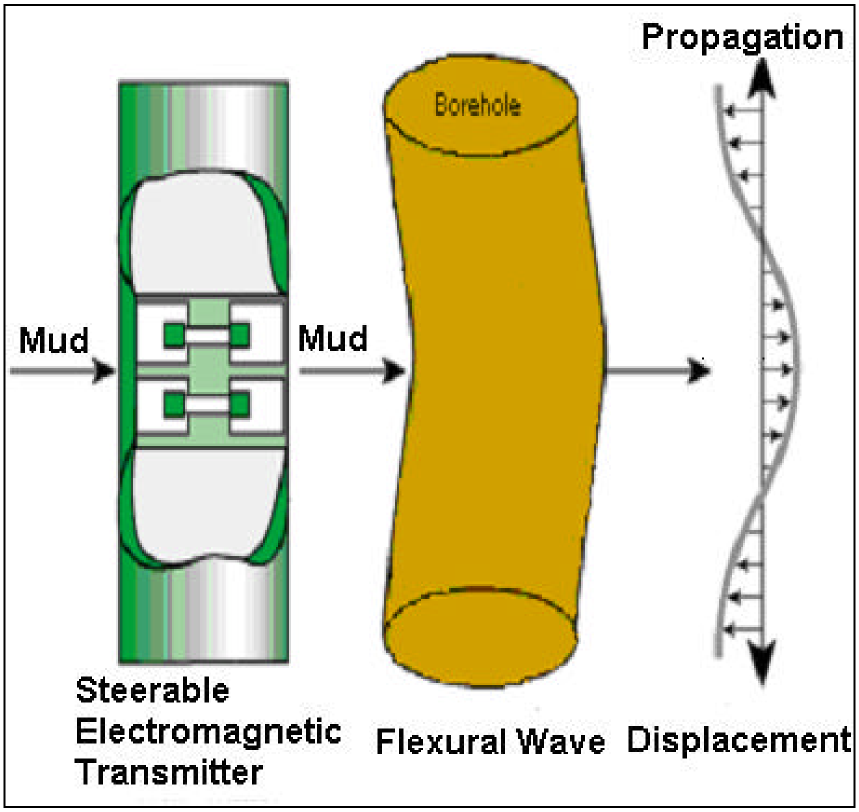


Figure 10: Flexural wave propagation to measure shear velocity

A problem of dispersion effects occurs with shear velocity measurements. Dispersion is the effect of variation of velocity with frequency and makes it difficult to determine a true formation shear. The higher the frequency, the more dispersion occurs. A method known as Bias Correction is applied real time in the field, which basically uses a correction based on numerical modelling. It is also based on a narrow frequency band at low frequencies where dispersion effect is less and so does not take into account the entire waveform. Although this is a fast and simple technique, it is not the best. Best-DT 3* uses a more advanced technique known as Dispersive STC Processing and is based on the entire waveform and uses model dispersion curves to correct for dispersion rather than a look up table, as with Bias correction. Correction is therefore more refined and accurate.

Dispersion depends on frequency, borehole size, formation shear slowness, mud slowness and formation to mud density ratio. In hard formations, mud slowness has less of an effect on dispersion.

Shear Anisotropy Measurement

For sonic measurements, it is well recognized that sedimentary rocks generally exhibit some degree of anisotropy. Anisotropy may arise from intrinsic structural effects, such as aligned fractures and layering of thin zones, or from unequal stresses within the formation. These effects lead to differences in formation elastic properties, and if they are on a smaller scale than the sonic wavelengths, then sonic wave propagation can be used to detect and quantify the anisotropy.

Sonic waves travel fastest when the direction of particle motion (polarization) is aligned with the material's stiffest direction. Shear-wave particle motion is in a plane perpendicular to the wave propagation direction. If the formation is anisotropic in this plane, meaning that there is one direction that is stiffer than another, then the shear-wave polarization aligned in the stiff direction will travel faster than one aligned in the other, more compliant direction. As a result, the shear wave splits into two components, one polarized along the formation's stiff (or fast) direction, and the other polarized along the formation's compliant (or slow) direction.

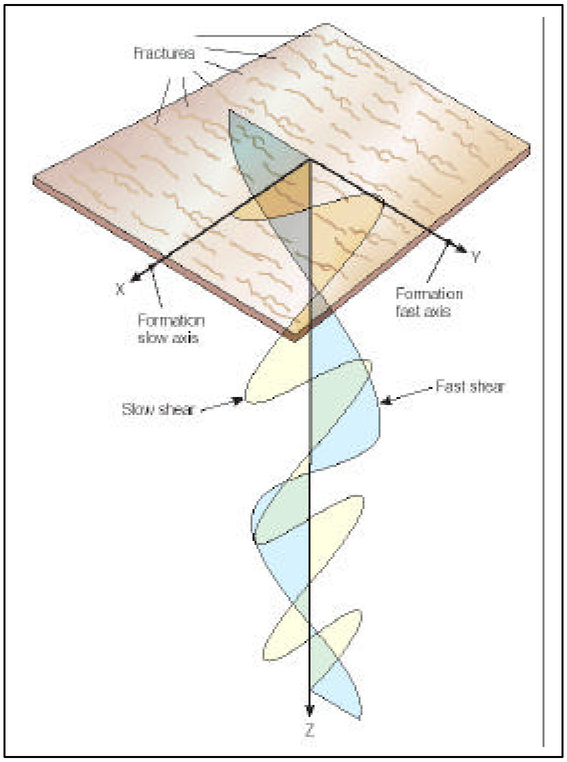
For example, in the case of vertically aligned dense micro-cracks or fractures, a shear wave that is polarized parallel to the fracture strike will propagate faster than a shear wave polarized perpendicular to it (**Figure 11**). In general, a shear (or flexural) wave, generated by a dipole source, will split into two orthogonal components polarized along the X- and Y-directions in the formation. As they propagate along the borehole, the fast wave will be polarized along the direction parallel to the fracture strike and a slow wave in the direction perpendicular to it.

With two orthogonal dipole transmitters and multiple receiver pairs aligned in orthogonal directions, the DSI Dipole Shear Sonic Imager tool can measure the components of shear slowness in any direction in a plane perpendicular to the borehole axis (**Figure 12**). The measurement involves recording the waveforms on receivers pointing in directions parallel and normal to each transmitter along the tool x- and y-axes.

Four sets of waveforms are recorded at each depth and receiver level. These measurements are labelled xx, xy, yx and yy. The first direction refers to the transmitter and the second direction to the receiver. The direction and speed of the fast and slow split shear waveforms travelling in the formation can be easily determined by mathematically rotating the measured waveforms through an azimuthal angle so that they line up with the two orthogonal formation X- and Y-directions. This is done by minimizing the cross-receiver energies, xy and yx.

The rotated direction of the fastest shear wave becomes the fast-shear tool azimuth; and the tool orientation, measured by a magnetometer, is used to determine the fast shear azimuth relative to true north. This rotation, called the Alford method, uses the fact that the anisotropy model expects the amplitude of the cross-receiver measurements to vanish when the measured axes x and y align with the anisotropy axes X and Y.

In addition to the fast and slow shear-wave velocities, determined by a slowness time coherence (STC) processing on the rotated waveforms, three measurements of anisotropy are computed. These are **energy anisotropy, slowness anisotropy** and **time anisotropy.**



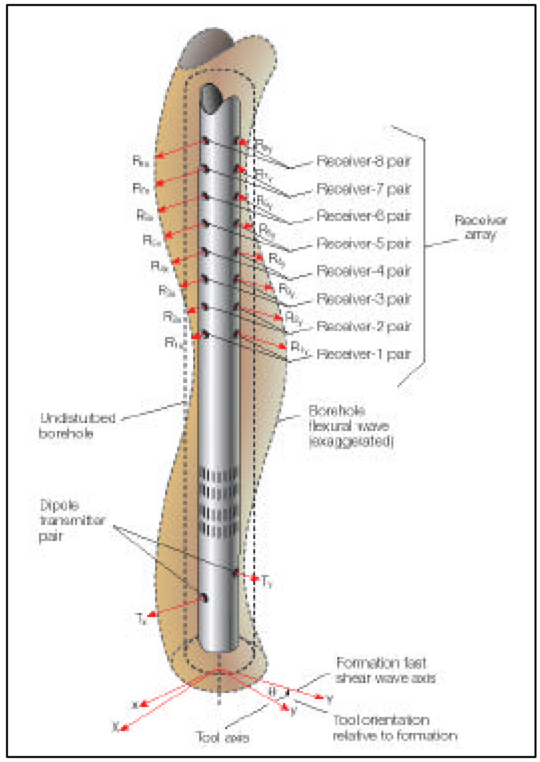


Figure 11: Shear wave splitting Mode

Figure 12: DSI tool showing X-Dipole (BCR)

Figure 11. Shear-wave splitting. Shear waves travel in an anisotropic formation with different speeds along the directions of the formation anisotropy. In this example, anisotropy is caused by the vertical fractures (or micro-cracks) with a strike direction along the formation Y-axis, and the fastest shear wave, with the longer wavelength component, will be polarized along the fracture strike direction as it propagates along the borehole (Z-axis). When shear wave splitting is the result of stress anisotropy, the Y-axis corresponds to the direction of maximum stress, and the X-axis corresponds to the direction of minimum stress.

Figure 12. During logging, flexural waves are induced by dipole transmitters fired sequentially in two perpendicular directions, first along the tool x and then the tool y-axes. In this example, the fastest component of the induced shear wave is polarized along the formation Y-axis direction, which is aligned along the fracture strike or maximum stress direction. The slowest component of the shear wave is polarized along the formation X-axis. Projections of these two shear-wave components are received by each of the dipole sonic tool x- and y-receiver pairs. The inline signals xx and yy are the x-receiver and y-receiver waveforms received when the x and y- transmitters are fired. Cross-signal components xy and yx are the y- and x-receiver waveforms received as the x- and y-transmitters are fired. The Alford rotation angle, q, is determined by minimizing the cross signal components. This would happen automatically if the tool axes were rotated through an angle, q, and aligned with the two orthogonal directions in the anisotropic formation.

Slowness anisotropy is the difference between the fast and slow slownesses calculated by STC on the rotated waveforms. It yields a quantitative measure of slowness anisotropy, and has the best vertical resolution at about 3 ft [1 m]; the size of the receiver array. It can be compared directly with seismic or core measurements of slowness anisotropy.

Travel time anisotropy is the arrival-time difference between the fast- and slow-shear waves at the receivers. It is obtained from a cross-correlation between fast and slow shear-wave arrivals at each receiver spacing. Time lags computed at each receiver are referenced to the largest offset receiver and averaged across the receiver array. This is divided by the average of the fast and slow arrival times to compute a percentage difference. The travel time anisotropy indicator is robust and quantitative, and has the vertical resolution of the average transmitter-receiver spacing, 13 ft [4 m]. Slowness and travel time anisotropy indicators are identical in formations with homogeneous beds thicker than 13 ft.

Energy anisotropy is the energy in the cross component waveforms as a percentage of energy in all four components. In an isotropic formation, energy anisotropy reads zero. In an anisotropic formation, the reading depends on the degree of anisotropy. Two curves are computed from the waveforms: minimum and maximum cross-energy.

The minimum cross-energy is the energy in the cross-components when the tool measurement axis lines up with the formation anisotropy axis. Minimum cross-energy reads zero in an ideal formation whether anisotropic or not. This curve is a good relative measure of whether the assumed model for anisotropy inversion fits the real formation.

The maximum cross-energy is a measure of the amount or strength of anisotropy. Unlike the two previous anisotropy measurements (slowness and time), energy anisotropy is a measure of both slowness and amplitude differences of the fast and slow shear waves. Large differences between the maximum and minimum values, especially when the minimum energy is low, indicate zones of significant anisotropy. Energy anisotropy, though qualitative, is little affected by processing, and is the principal measure of anisotropy.

ENCLOSURE 1

MASTER LOG

1:500 SCALE

MASTERLOG
WEST WHIPTAIL-1

Esso | Geoservices

GENERAL	POSITION	HOLE / CASING INFO	DATE / DEPTH	ENGINEERS
Country : Australia	Local Co-ord X : 38° 19' 29.150" S	12-1/4" Hole to 750.0m	Spud Date : 10-05-2004	Phil Rady
Permit : VIC/L1	Local Co-ord Y : 147° 30' 17.167" E	8-1/2" Hole to 1539.0m	Total Depth Date : 20-05-2004	Matt Boyd
Field : Whiptail	AMG Co-ord X : 544,121.32m E		Total Depth : 1539 mRT	Tom Platt
Basin : Gippsland	AMG Co-ord Y : 5,758,030.22m N	13-3/8" Conductor Set @ 120.0m	True Vertical Depth : 1539 mRT	Noel Elliott
Well Type : NR.Field Wildcat	RT to MSL : 39.0m	9-5/8" Casing Set @ 745.0m	Log Scale : 1/ 500	
Rig Name : Ensco 102	RT to Sea Bed : 78.0m		Final Status : Plugged & Abandoned	

ABBREVIATIONS

MW	Mud Weight	WOB	Weight on Bit (klbs)
FV	Funnel Viscosity	RPM	Rotations Per Min
PV	Plastic Viscosity	FLW	Flow Rate (gpm)
YP	Yield Point	SPP	Pump Pressure (psi)
Gel	Gel Strength	RR	Re-Run Bit
WL	Water Loss	TG	Trip Gas
KCl	Potassium Chloride	CG	Connection Gas
Cl	Chlorides	BG	Background Gas
Inc	Inclination	DGP	Drilled Gas Peak
Az	Azimuth	MM	Mud Motor

LITHOLOGY LEGEND

CLAYSTONE	MARL	BRYOZOA	CARB FRAGMENT
SILTSTONE	LIMESTONE	RADIOLARITES	QUARTZITE
SST: F - V FINE	DOLOMITE	ECHINOIDS	INTRUSIVES
SST: MEDIUM	CHERT	CORALS	GLAUCONITE
SST: COARSE	CONGLOMERATE	FORAMINIFERA	PYRITE
SHALE	COAL	LITHIC FRAGMENT	CEMENT

ENGINEERING LEGEND

CASING SHOE	WIRELINE LOGS
LINER HANGER	MDT POINTS:
BIT CHANGE	PRESSURE ONLY
DEVIA. SURVEY	SAMPLE
SWC UNRECOV	SEAL FAILURE
SIDEWALL CORE	TIGHT
CORE	

ROP (m/hr): 500 50 5 .5
WOB (tons): 50 25 0
MWD Gamma Ray (api): 0 100 200

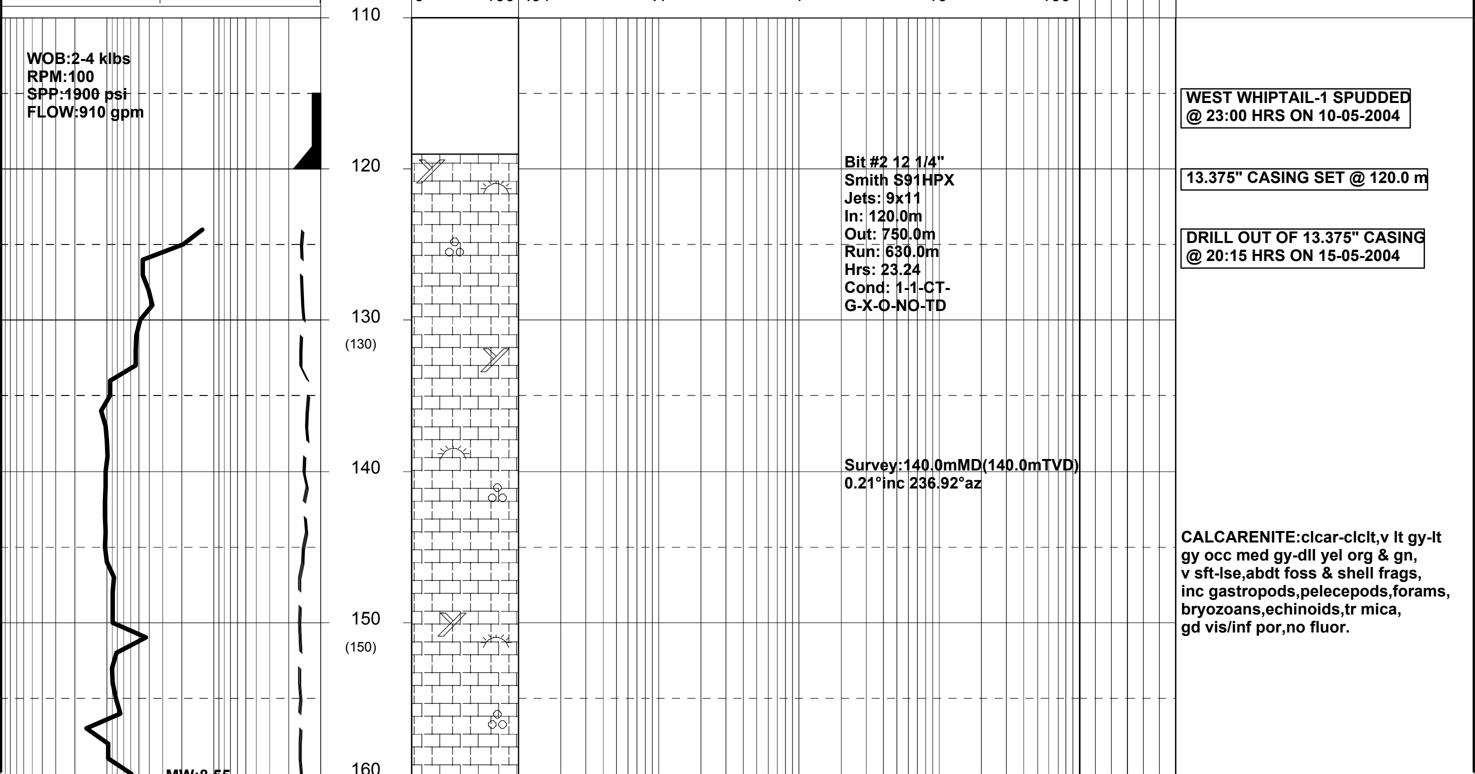
DEPTH (m) (TVD)

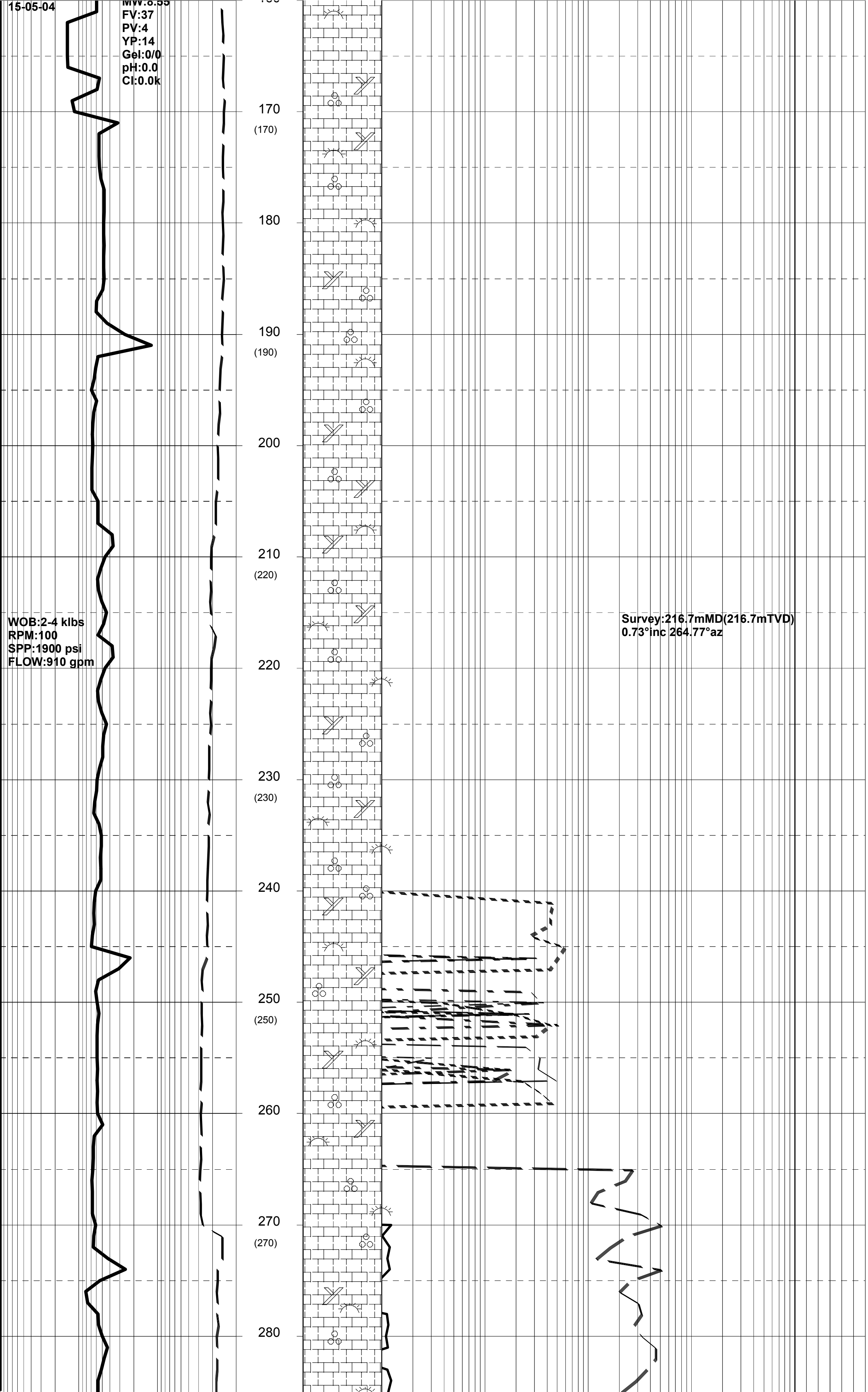
CUTTINGS LITHOLOGY % 0 100

TOTAL GAS & CHROMATOGRAPH DATA
C1, C2, C3, iC4, nC4, iC5, nC5, TG
Total Gas in Units: .5 5 50 500 5K
Chromatograph in Percent: .01 .1 1 10 100

CUT FLUOR: good fair poor
DIRECT FLUOR: good fair poor

LITHOLOGICAL DESCRIPTIONS and REMARKS

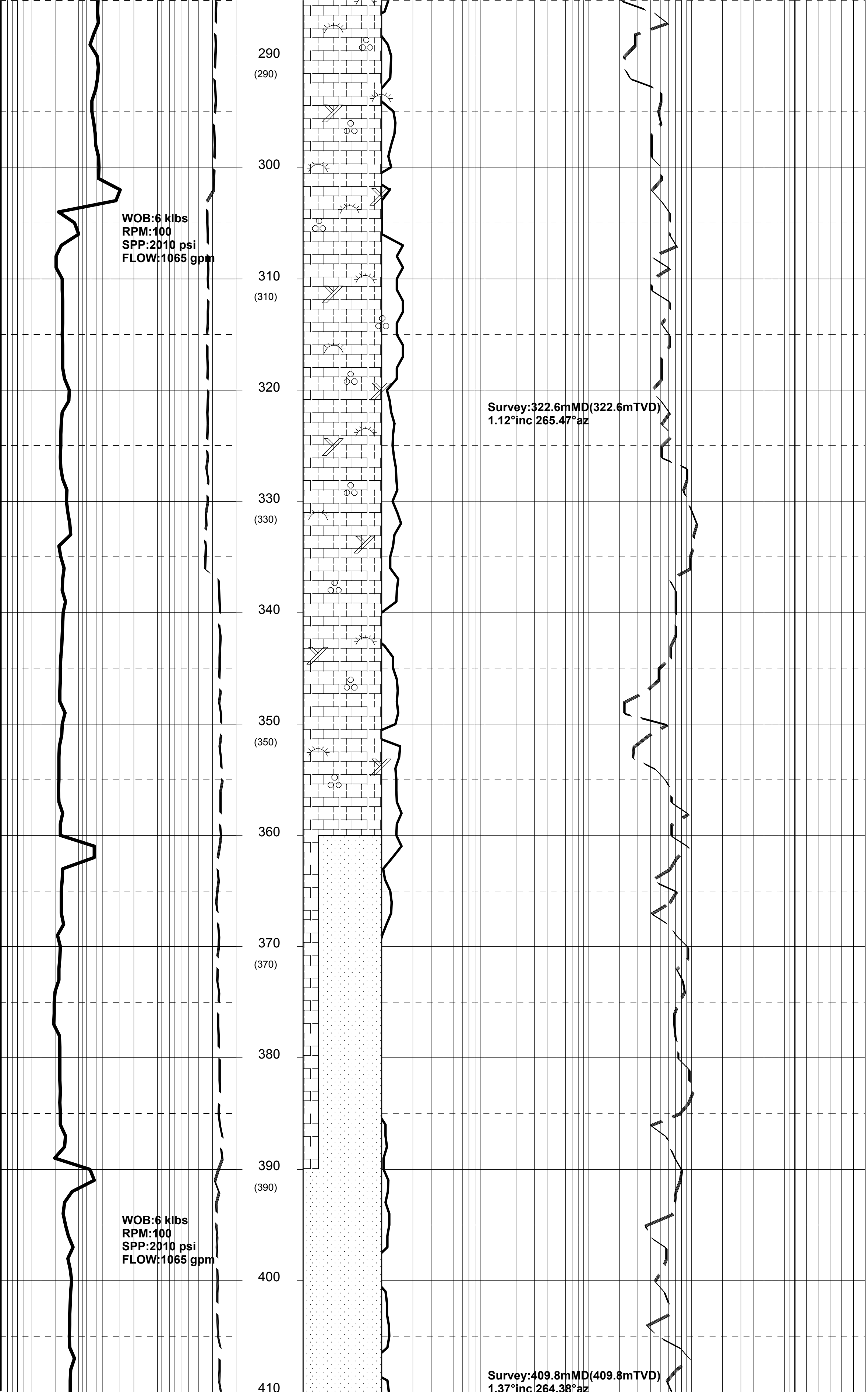




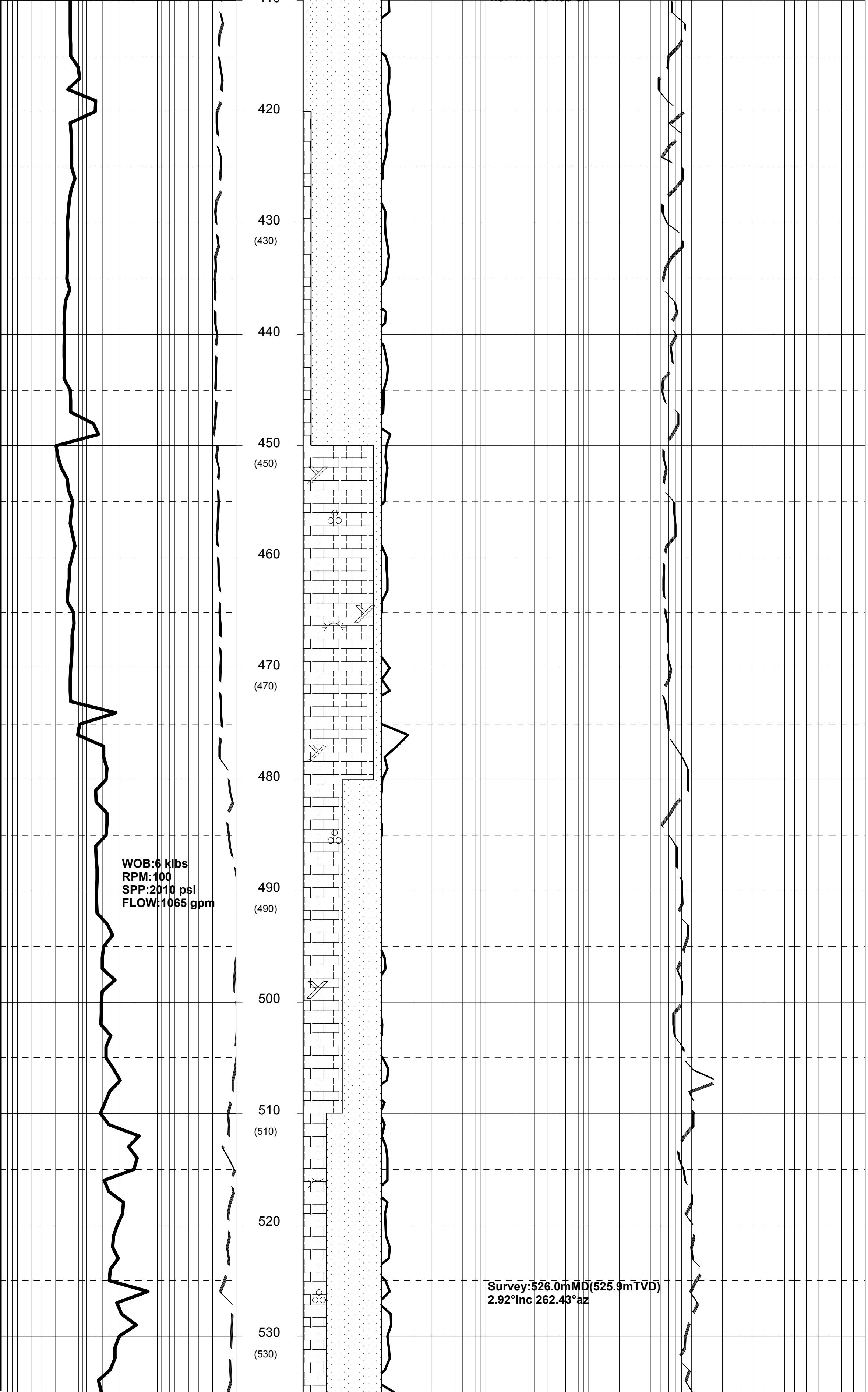
CALCARENITE:v lt gy,abdt foss & shell frags,inc gastropods, pelecepods,forams,bryozoans, echinoids,tr mica, gd vis/inf por, no fluor.

CALCARENITE:v lt gy- pred lt gy, lse-fri agg,abdt foss frag,inc pred bryozoans,pelecepods,forams, echinoids,tr mica, gd vis/inf por, no fluor.

CALCARENITE:v lt gy- pred lt gy, lse-fri agg,abdt foss frag,inc pred bryozoans,pelecepods,forams, echinoids,tr mica, gd vis/inf por, no fluor.



SANDSTONE:clr-trnsl,med-dk yelsh org stn,med -crs,pr srt,rnd-w rnd, wk calc/sil cmt,lse,v gd inf por, no fluor.

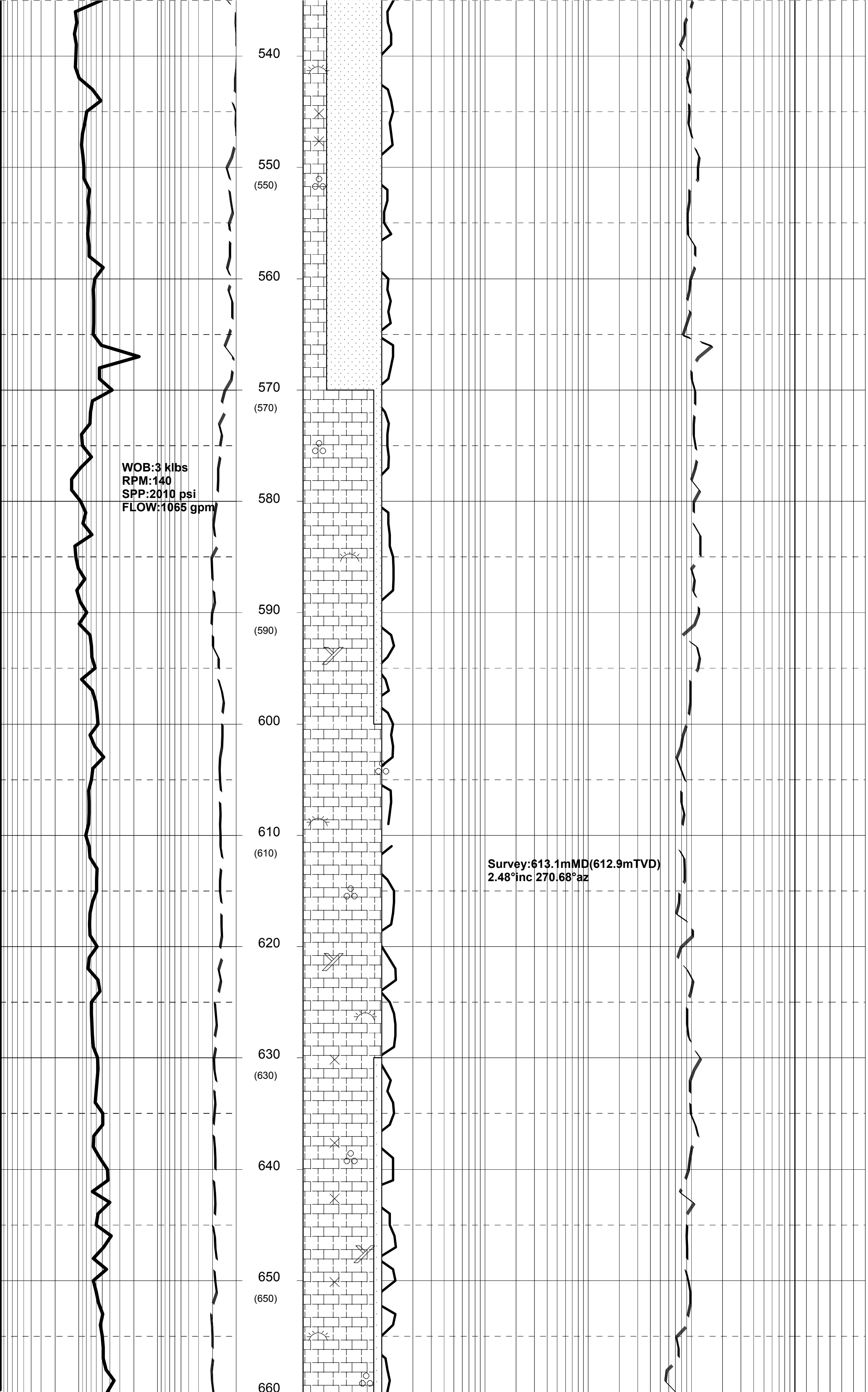


SANDSTONE:clr-trnsl,med-dk yelsh org stn,vf-crs dom f-med,pr srt,rnd, wk calc/sil cmt,lse,v gd inf por, no fluor.

CALCARENITE: off wh-lt gy,v fn-crs grn,pr-mod srt,sub ang-sub rnd, mod-wk calc cmt,foss frag,tr glauc,fri- mod hd,n vis por,tr min fluor,dull yel,n cut

SANDSTONE:clr-trnsl,med-dk yelsh org stn,vf-crs dom f-med,pr srt,rnd, wk calc/sil cmt,lse,v gd inf por, no fluor.

CALCARENITE:off wh-lt gy/bn, pred f occ crs,sa-sr,wk calc mtx,com foss frag,tr glauc.

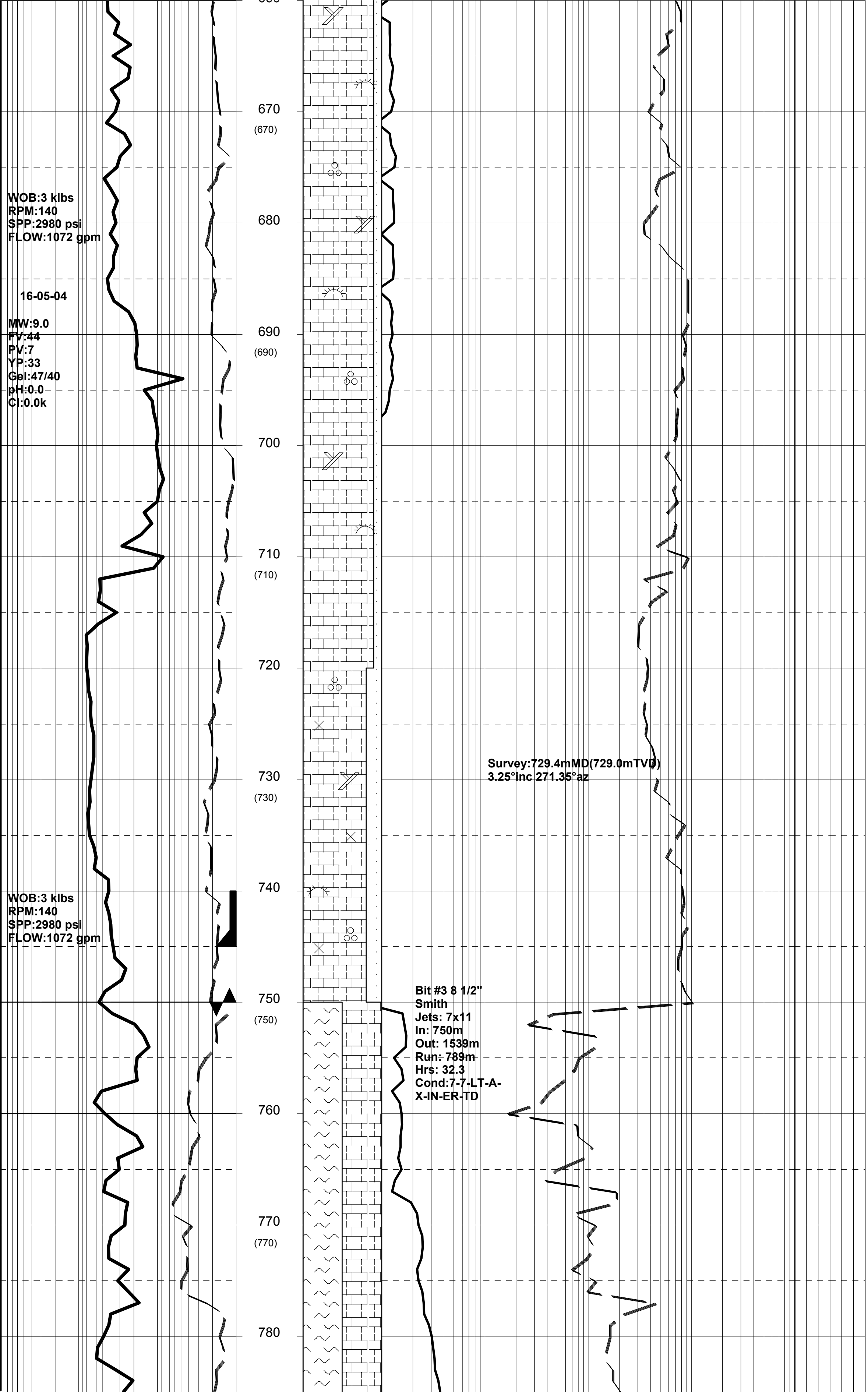


CALCARENITE:off wh-pl gy/bn,pred fn,occ crs,sa-sr,wk calc mtx,com foss frag,tr glauc.

CALCARENITE:off wh-trnsl,vf-crs grn pred f-med grn,pr srt,sr-sa, wk cmt,tr lst frag,pr vis por.

CALCARENITE:off wh-pa gy/bn, v f-crs,sa-sr,abdt calc mtx, mod hd- fri,com foss frag.

CALCARENITE:off wh-pl gy bn,vf-f grn,mod w srt,abdt calc cmt/mtx, tr micfoss frag,tr glauc,mod hd, ti vis por,5% sol dull yel min fluor.



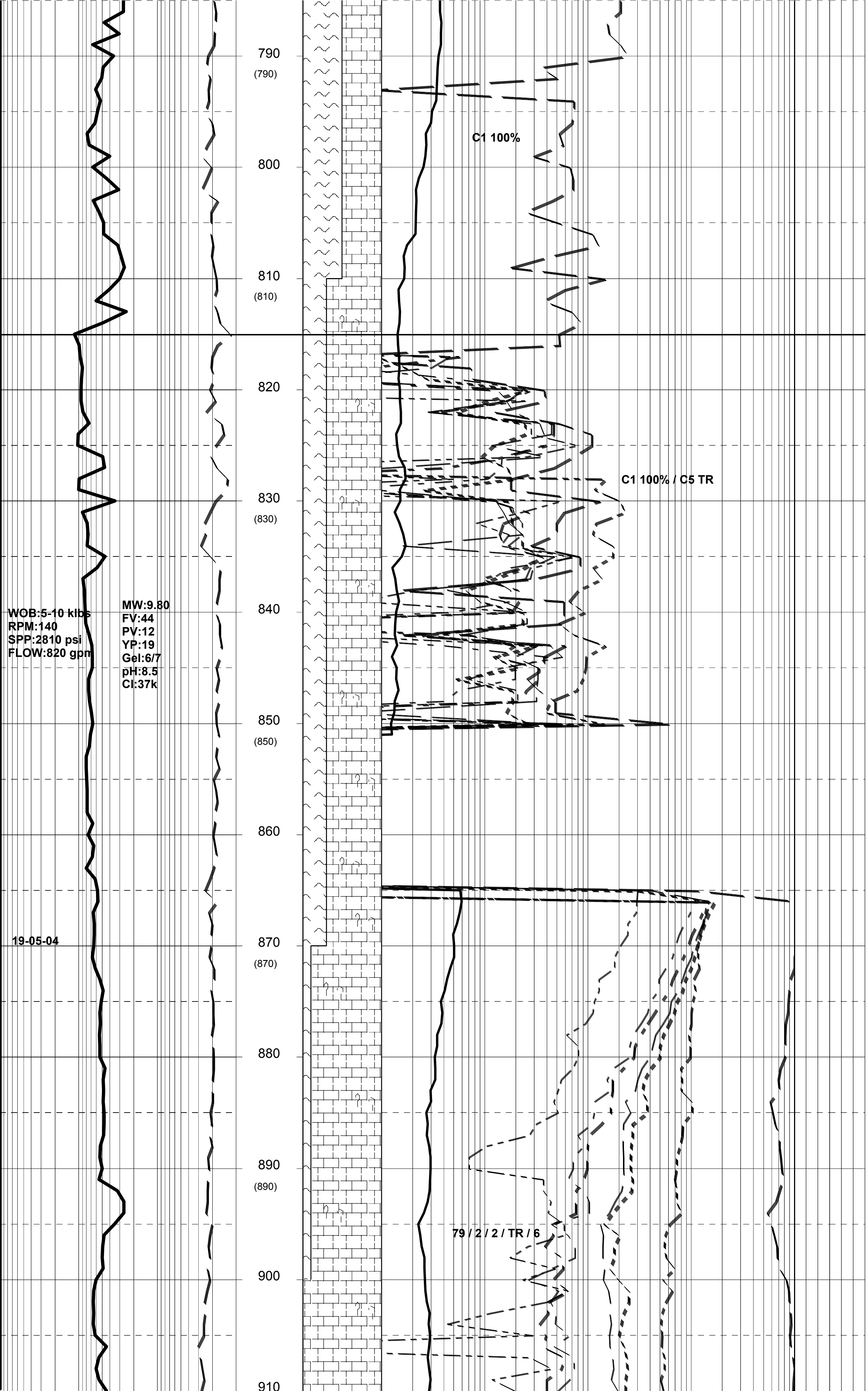
CALCISILTITE:pl gy mott wh,
sbblky,arg,rr wh lith frag,mod hd.

CALCARENITE:off wh-pl gy bn,vf-f
mod w srt,abdt calc cmt/mtx,
tr micfoss frag,tr glauc,mod hd,
ti vis por,5% sol dull yel min fluor.

9-5/8" Casing Shoe @ 745m

CALCISILTITE:pl gy mott wh,
sbblky,arg,rr wh lith frag,mod hd.

CALCISILTITE:gy-bn gy,sr,g/t MARL
blky i/p,occ sa,frm occ sft,occ
foss frag,tr glauc,no flour.



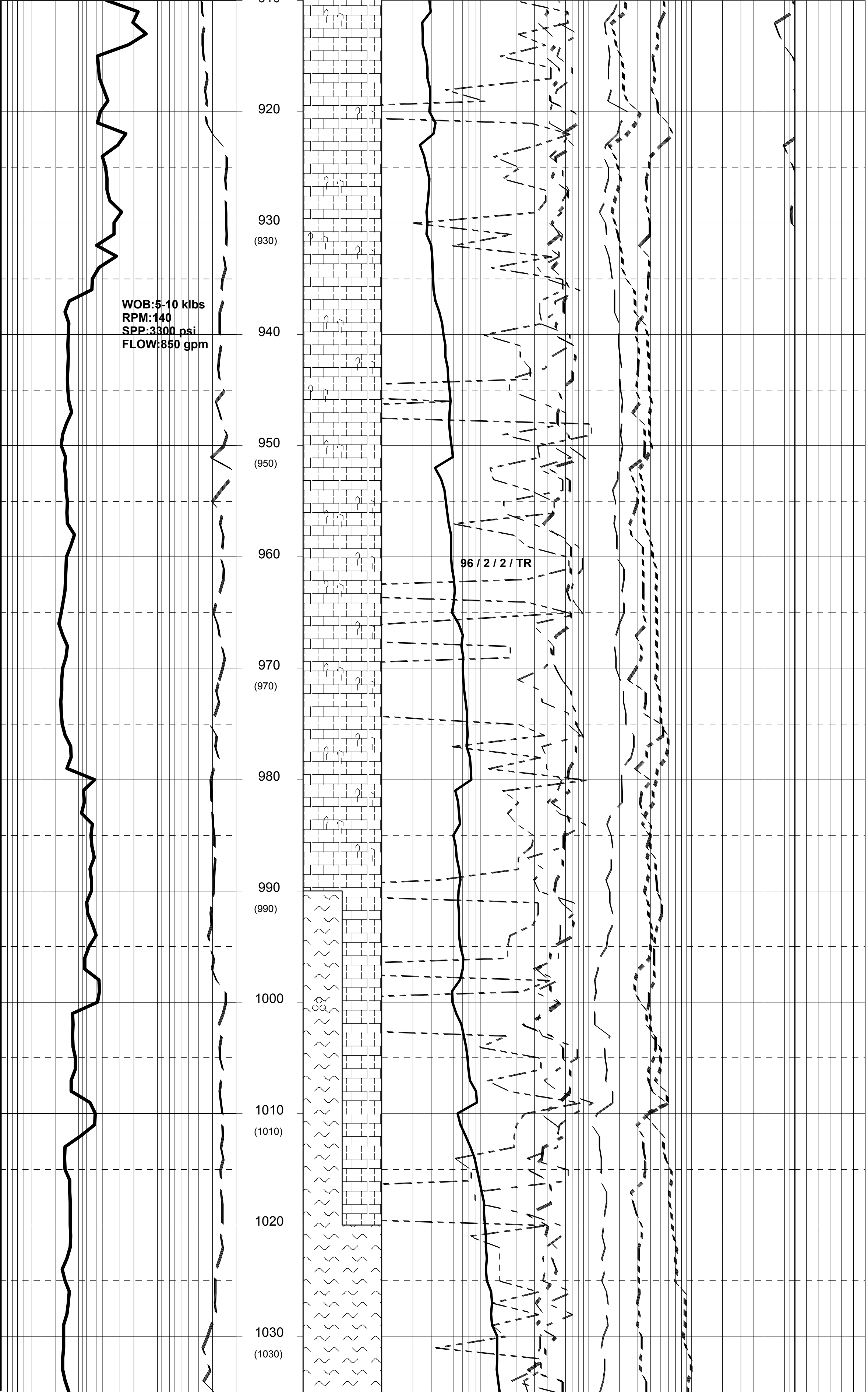
CALCISILTITE:pl gy-off wh,sr,
blky i/p,occ sa,frm,occ sft,
occ foss frag,tr glauc,no flour.

LAKES ENTRANCE:815m(SS:-776m)

Inject test gas through degasser
clear debris from suction head

CALCISILTITE:pl gy-off wh,arg,sr,
blky i/p,occ sa,frm,occ sft,
occ foss frag,tr glauc.

CALCISILTITE:med gy,v arg,g/t
MARL i/p,slty i/p,frm-fri,occ
sft,sbblky.

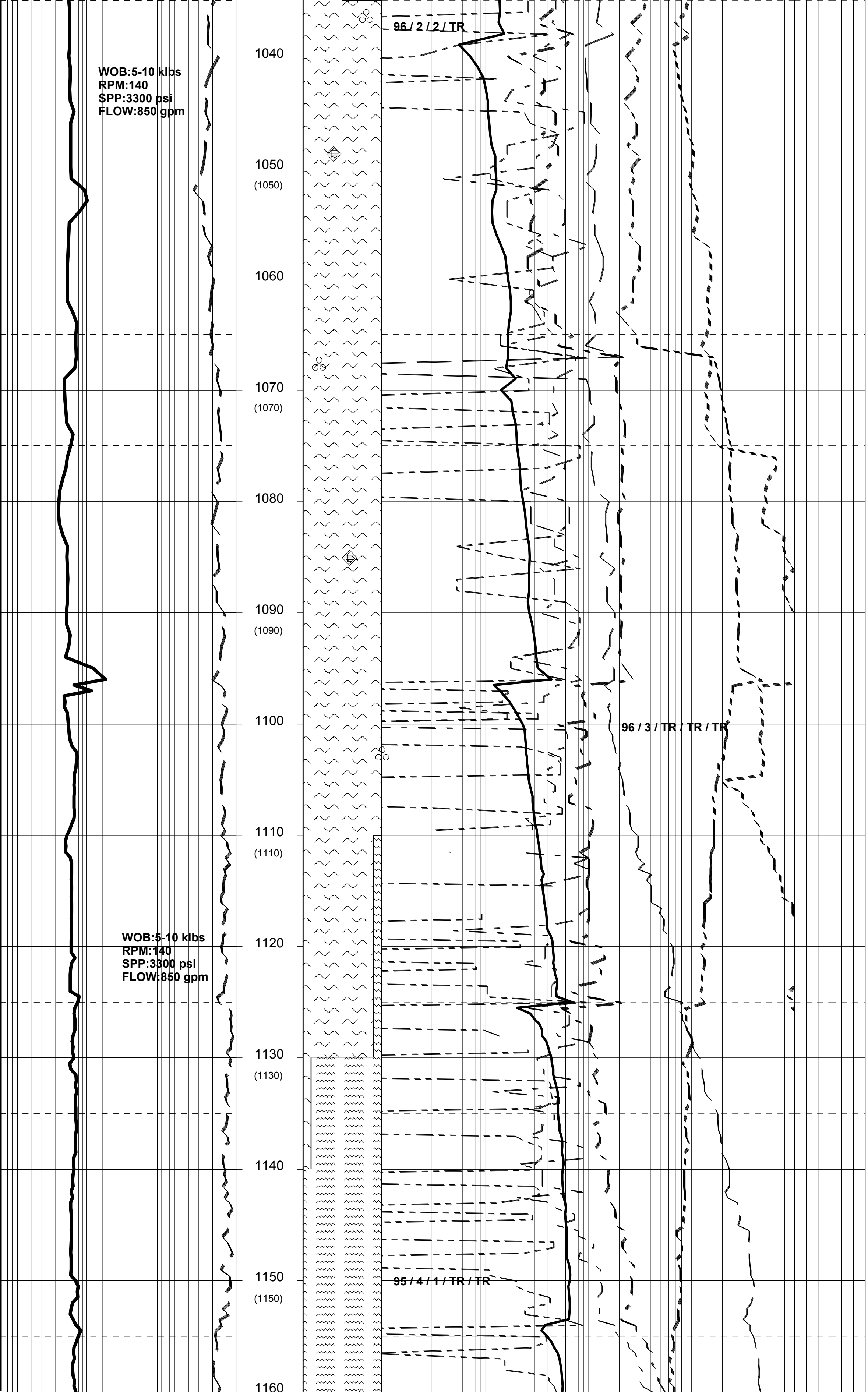


CALCISILTITE:med gy,v arg,
slty i/p,frm-fri,occ sft,
sbblky.

CALCISILTITE:med gy,v arg,
slty i/p,frm-fri,occ sft,
tr pyr,tr glauc,sbblky.

CALCISILTITE:lt-med gy,v arg,
sft-frm,sbblky-blky,slty i/p,
g/t arg CLSLT,tr pyr,tr glauc,
tr forams.

MARL:lt-med gy-lt-med gnsh gy,
arg,tr foss,tr pyr,sbblky-blky.



MARL:lt-med gy-V lt gnsh gy, v sft-sft rr frm,sbblky,arg,tr foss,tr nod glauc.

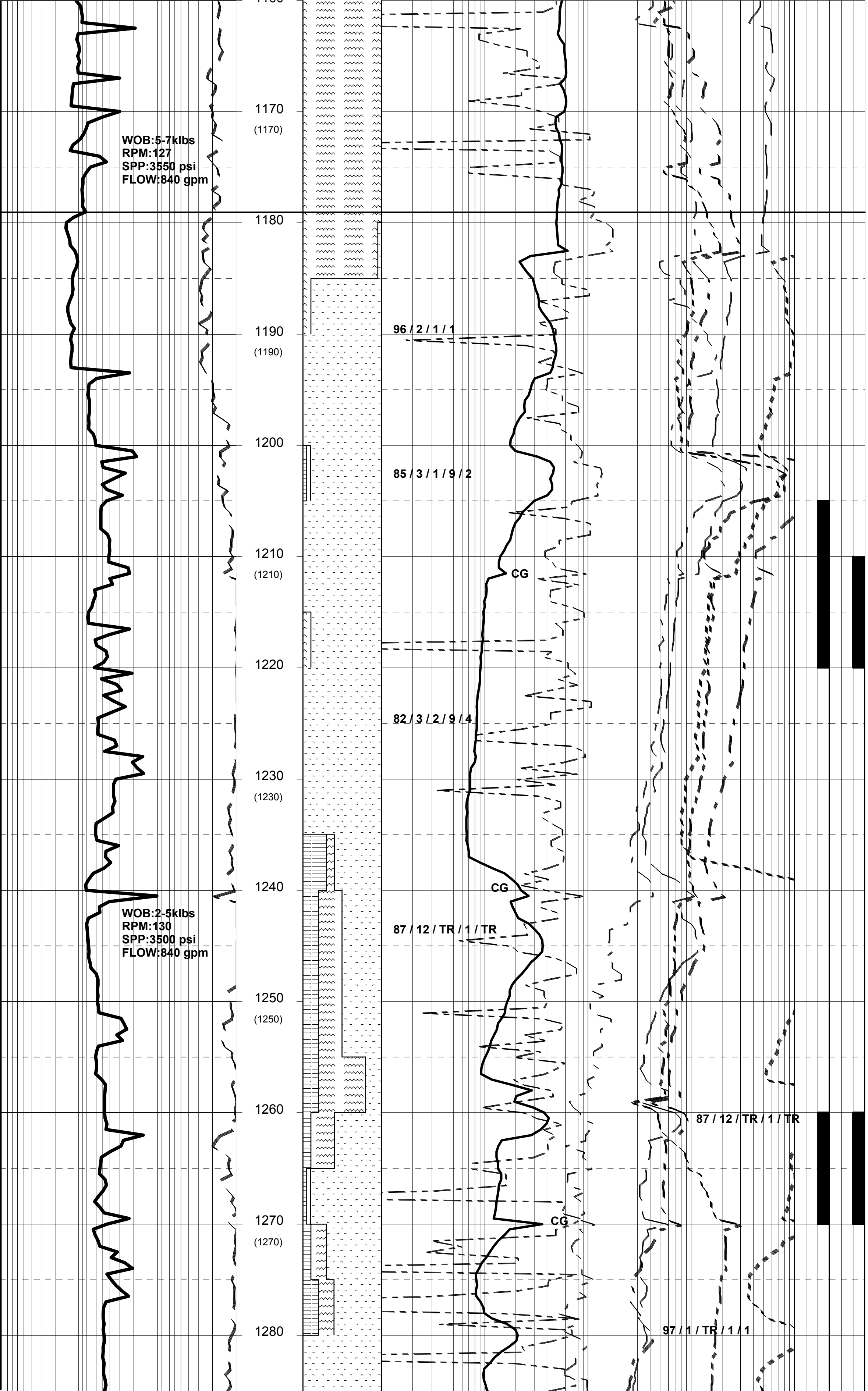
MARL:lt-med gy-V lt gnsh gy, v sft-sft rr frm,sbblky,arg,tr foss,tr nod glauc.

Carbide Lag Check @ 1067m

MARL:lt-med gy-v lt gnsh gy occ bnsh gy,sft-rr frm,sbblky occ blky,rr slty, tr foram,tr nod glauc,rr pyr.

MARL:lt-med gy-v lt gnsh gy occ bnsh gy bec off wh,sft-rr frm,sbblky, tr foram,tr nod glauc,rr pyr.

SILTSTONE:bnsh gy,v sft-sft,arg, calc-v calc,tr carb spks,rr diss pyr,glauc i/p.



SILTSTONE:bnsh gy-dk bnsh,v sft-sft,sbblky,arg,v calc,tr carb spks, rr diss/nod pyr,v glauc i/p.

LATROBE GROUP:1179m(SS:-1140m)

SANDSTONE:lt gy,f-v crs,pr srt, sub ang-sub rnd,wk-mod sil cmt, wh arg mtx,com glauc,tr mica, fr inf por,no flour.

SANDSTONE:lt gy,f-v crs,v pr srt, sa-sr,wk-mod sil cmt,com wh arg mtx, com glauc,tr-com mic,lse clr-trnsl grn,gd inf por,no fluor.

SILTSONE:pa-med gy & bn,arg,com carb lam,occ carb spks,tr mica, frm,sbblky.
COAL:blk,dull,sbconch frac.

SANDSTONE: trnsl-off wh,f-v cr,pr srt sr-sa,wk sil cmt,abdt qtz ovgth,tr wh slty mtx,fri,gd inf por
FLUOR:1205m -1220m, 5% dc tr mod bri,yel,ptchy-sol fluor.slw diff to inst yel c/c,thn r/r.

SANDSTONE:trnsl-off wh,m-v crs,pr sr sa,wk-mod sil cmt,abdt qtz ovgths,gen cln,tr wh slty mtx,rr pyr & glauc nod fri-mod hd(where cmt),gd inf por,pr vis por,
FLUOR:a/a.

(1)SILTSTONE:pl-med brn,arg,com carb,lith & glauc frag,frm-mod hd,sbblky.

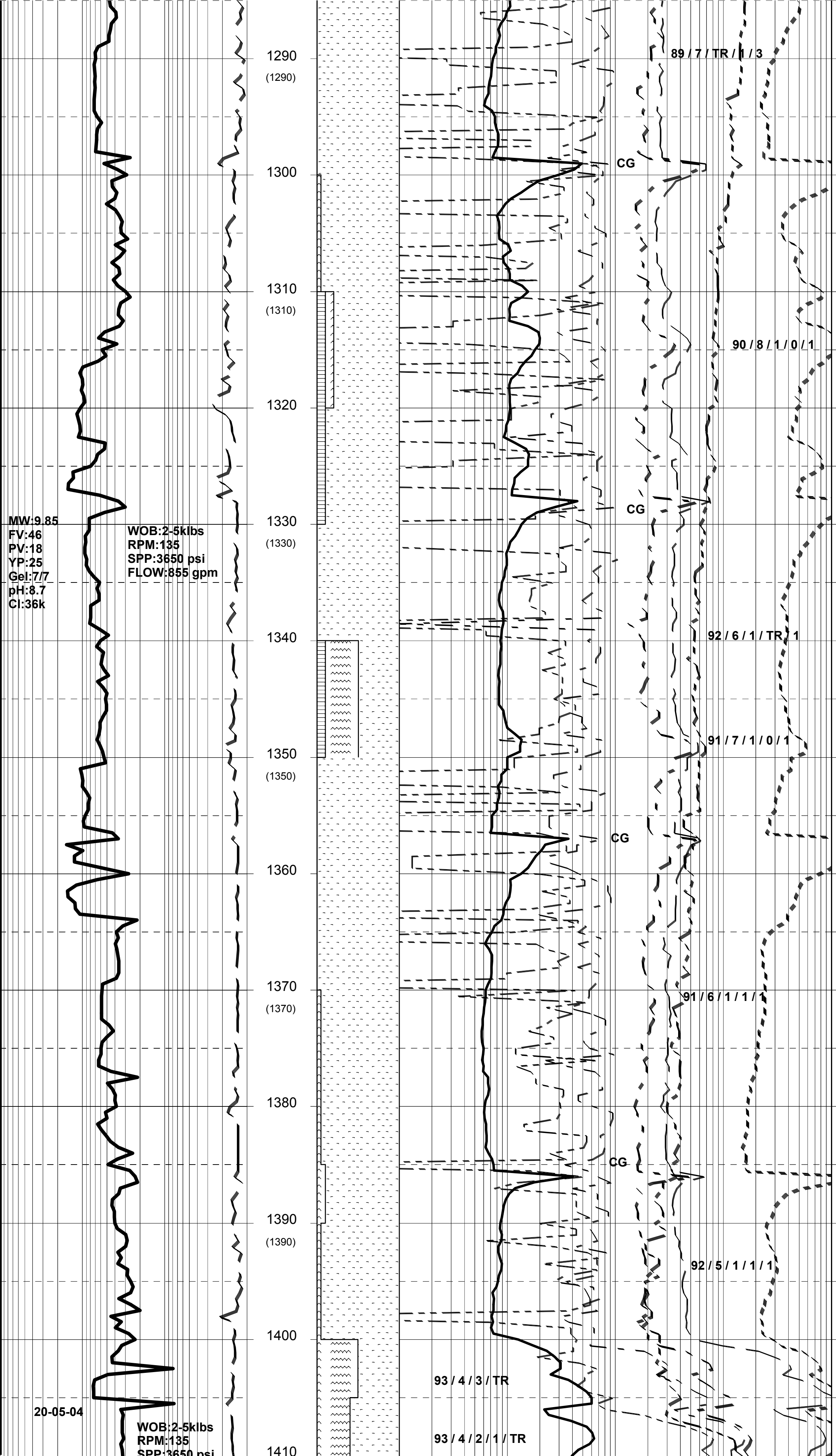
SANDSTONE:trans-pa bn,fn-crs,pred fn-med,mod srt,sa-sr,wk sil cmt, com bn slty mtx,fri,gd inf por, no flour.

COAL:blk,dull,grd to carb sltst,britt, blky.

(2)SILTSTONE:v pa gn-gy,aren gd to vf sst,com lithic frag,mod hd, subblky.

SANDSTONE:pa gy-bn,off wh,vf-med occ crs,mod srt,sa-rnd,mod-wk sil & calc cmt,wh slty mtx,tr glauc, fri-mod hd,tr inf pr.
FLOUR:1260-1270,5%-tr,dul,sld,yel flour,slow c/c,thn yel-wh flm res.

SANDSTONE:clr-trnsl,med-v crs,pr



srt,sa-ang,wk sil cmt,abdt,qtz o/g,fri,gd-v gd inf pr,no fluor.

10m SAMPLES FROM 1300m

SANDSTONE:trnsl-off wh,f-v crs,pr srt sa-sr,wk sil cmt,abd qtz ovgths,cln, fri,gd -exc inf por,no fluor

SILTSTONE:dk rd/bn,arg,abd carb lam, frm,blky.

(1)SILTSTONE:pl-m brn,arg,com carb, lith & glauc frag,frm-mod hd,sbblky.

(2)SILTSTONE:v pa gn-gy,arg,v calc, mod hd,sbblky.

SANDSTONE:trnsl,f-v crs,pred med, pr srt,ang-sr,abd qtz,fri-mod hd, tr pyr,gd inf por,no flour.

(1)SILTSTONE:pl-m brn,arg,com carb, lith & glauc frag,frm-mod hd,sbblky.

COAL:blk,dul,brt,blky,grd to carb sltst.

SANDSTONE:clr-trnsl,fn-v crs,pred med,pr srt,wk sil cmt,com crs qtz grn,cln,fri,gd-exl inf por,no flour.

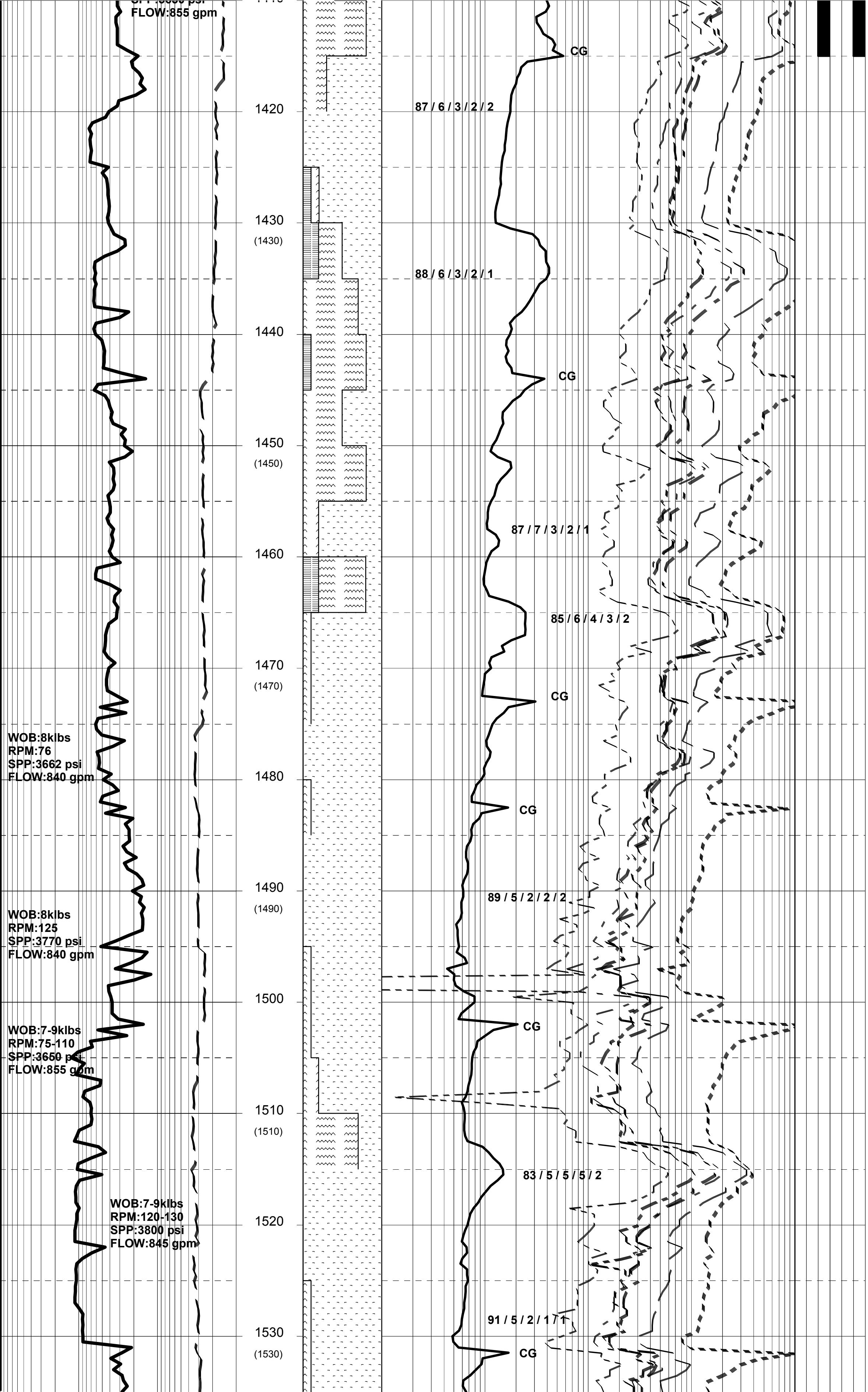
5m SAMPLES FROM 1380m

SANDSTONE:trnsl,f-v crs,pred med grn,pr srt,ang-sr,abdt qtz,fri- mod hd,gd inf por,tr pyr,no flour.

SANDSTONE:clr-off wh,fn-crs,pred med-crs grn,mod srt,sub ang (crs)- sub rnd (fn),wk sil cmt,com qtz spks (crs),cln,fri,gd inf por, no flour.

(1)SILTSTONE:v dk-dk gy-med gy bn- med bn,v carb,occ cl inc,mic mic, sl calc,frm-fri,blky-sbblky.

(2)SILTSTONE:pl gy gn,arg,rr carb



spks,mod calc,frm-sft,sbblky-blky.

SANDSTONE:clr-trnsl,f-v crs,pred crs-v crs,pr srt,ang-sr,occ ang frac grns, cln,tr wh arg mtx,gd inf por, FLUOR:tr dull yel pnpt,no dir cut,tr v slw crsh cut,tr wh res ring.

SILTSTONE:v dk-dk gy-red bn-med bn,v carb,occ cl inc,mic mic,com glauc,sl calc,frm-fri,blky-sbblky.

SANDSTONE:clr-trnsl,med-v crs com crs-v crs,sa-sr,p srt,lse,tr sil cmt,tr wh arg mtx,gd inf por,no fluor.

SILTSTONE:bn gy-bnsh blk,frm britt i/p,v carb,com carb lam,micmic,com glauc,sl calc,frm-fri,blky-fiss.

(1)SILTSTONE:(dom)lt bnsh gy occ lt b v sft,dip i/p,occ carb lam/spks, v sft,amor.

(2)SILTSTONE:gnsh gy,arg,frm,calc, occ glauc,sbblky-blky.

SANDSTONE:clr-trnsl-mlky wh,med-v crs com crs-v crs,sa-sr,p srt, wk sil cmt,lse,tr strng pyr cmt,tr wh arg mtx,gd inf por,no fluor.

COAL:blk,dull,britt,uneven frac,rr sbconch,slty i/p,g/t inter lam w/ carb sltst.

SILTSTONE:bnsh gy-bnsh blk occ redsh bn,v carb,g/t carb sltst, frm,blky-britt.

SANDSTONE:clr-trnsl,vf-vc,v pr srt,sa-sr,wk sil cmt,lse,cln w/tr wh arg mtx, gd inf por,no fluor.

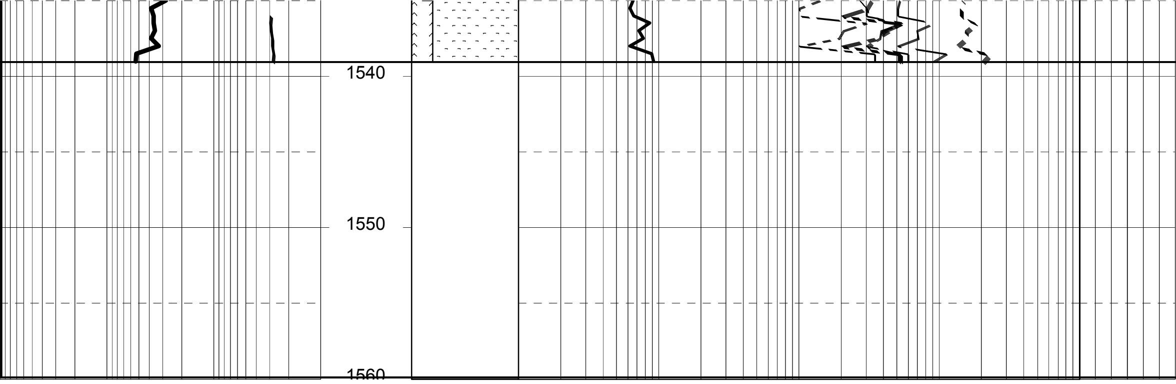
(1)SILTSTONE:med-dk bn occ lt-med gy,com carb spks,glauc,sft-frm, sbblky-sbfiss.

(2)SILTSTONE:minor comp,gnsh gy, calc,sft-frm,sbblky-amor.

SANDSTONE:clr-trnsl,med-vc,mod srt, sr,lse,cln w/tr wh arg mtx,tr pyr cmt, gd inf por,no fluor.

SILTSTONE:med-dk bn occ lt-med gy,com carb spks,glauc,sft-frm, g/t carb sltst,sbblky-sbfiss.

SANDSTONE:clr-trnsl,med-vc,mod srt, sa-sr,lse,abdt wh arg mtx,gd inf por,



no fluor.

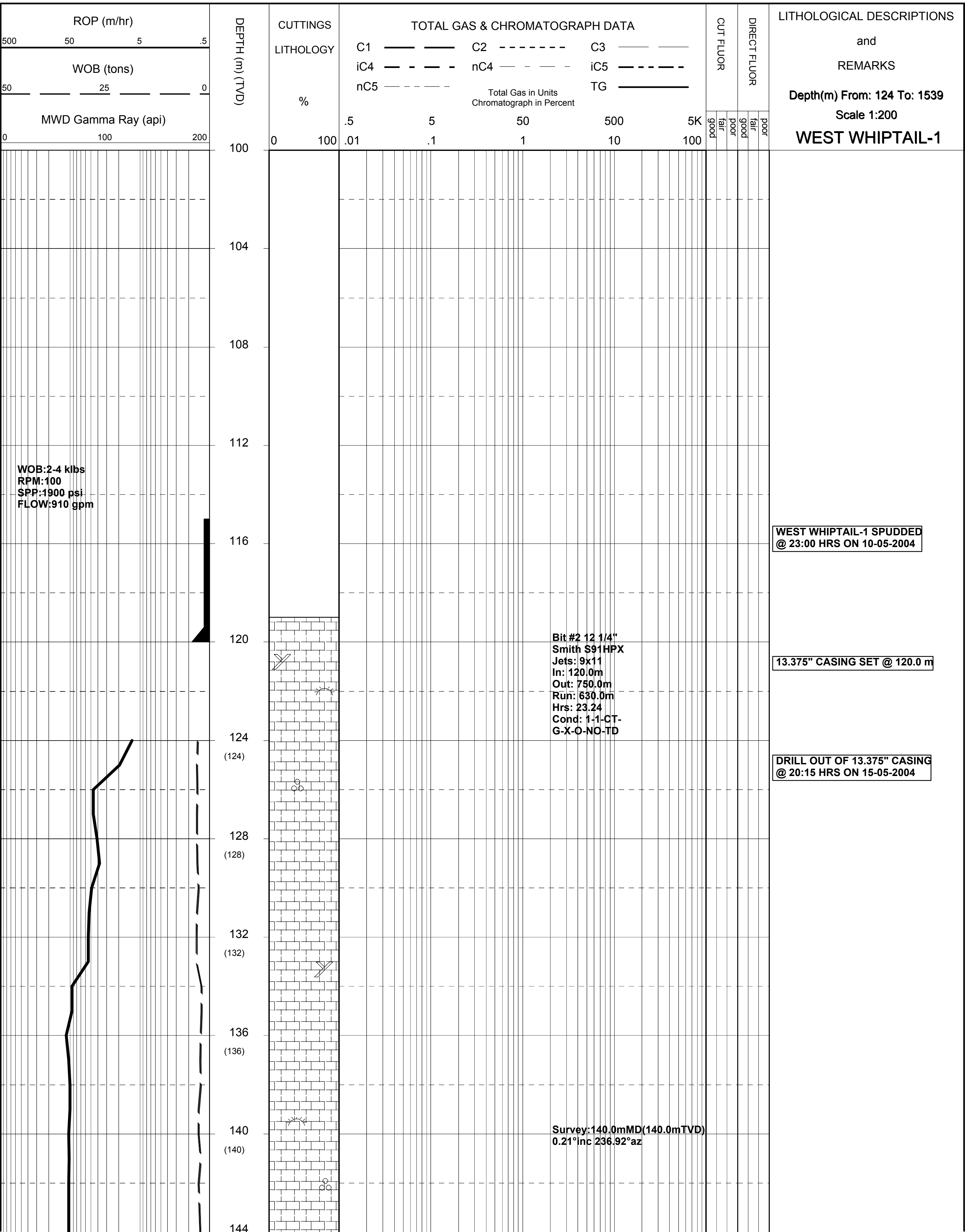
WEST WHIPTAIL-1
REACHED TD @ 1539.0mMDRT
@ 09:00 HRS ON 20-05-2004

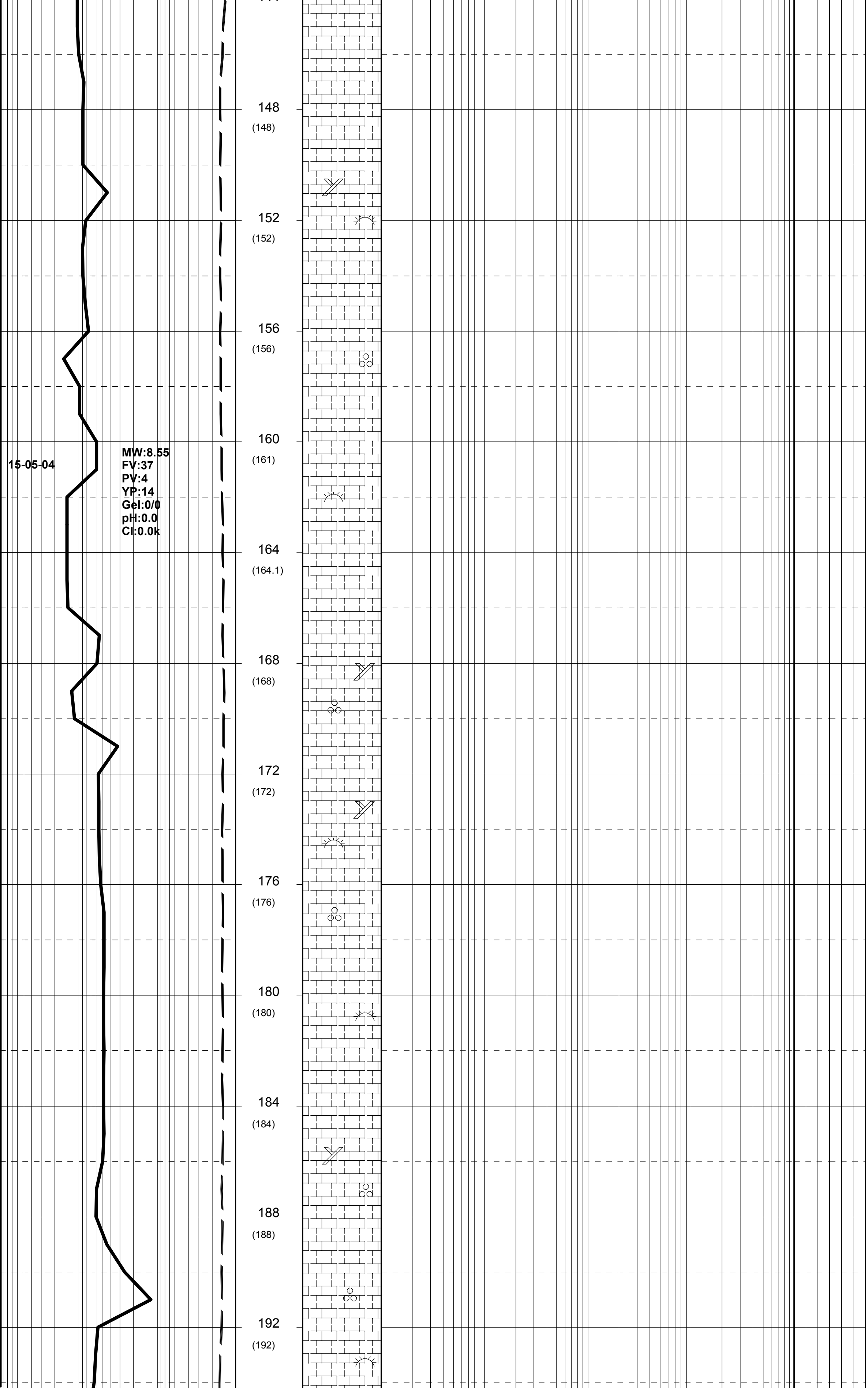
E-LOG RUNS
(1) PEX-HALS-HNGS-DSI
(2) MDT-GR (aborted)
(2A) MDT-GR
(3) CSAT-GR

ENCLOSURE 2

MASTER LOG

1:200 SCALE


ROP (m/hr)
500 50 5 .5
WOB (tons)
50 25 0
MWD Gamma Ray (api)
0 100 200
DEPTH (m) (TVD)
CUTTINGS LITHOLOGY %
0 100
TOTAL GAS & CHROMATOGRAPH DATA
C1 C2 C3
iC4 nC4 iC5
nC5 TG
Total Gas in Units
Chromatograph in Percent
.5 5 50 500 5K
.01 .1 1 10 100
CUT FLUOR
DIRECT FLUOR
good fair poor good fair poor
LITHOLOGICAL DESCRIPTIONS and REMARKS
Depth(m) From: 124 To: 1539
Scale 1:200
WEST WHIPTAIL-1
100
104
108
112
116
120
124 (124)
128 (128)
132 (132)
136 (136)
140 (140)
144
WOB:2-4 klbs
RPM:100
SPP:1900 psi
FLOW:910 gpm
WEST WHIPTAIL-1 SPUDDED
@ 23:00 HRS ON 10-05-2004
Bit #2 12 1/4"
Smith S91HPX
Jets: 9x11
In: 120.0m
Out: 750.0m
Run: 630.0m
Hrs: 23.24
Cond: 1-1-CT-
G-X-O-NO-TD
13.375" CASING SET @ 120.0 m
DRILL OUT OF 13.375" CASING
@ 20:15 HRS ON 15-05-2004
Survey:140.0mMD(140.0mTVD)
0.21°inc 236.92°az



CALCARENITE:clcar-clclt,v lt gy-lt gy occ med gy-dll yel org & gn, v sft-lse,abdt foss & shell frags, inc gastropods,pelecepods,forams, bryozoans,echinoids,tr mica, gd vis/inf por,no fluor.

CALCARENITE:v lt gy,abdt foss & shell frags,inc gastropods, pelecepods,forams,bryozoans, echinoids,tr mica, gd vis/inf por, no fluor.

196
(196)

200
(200)

204
(204)

208
(218)

212
(222)

CALCARENITE:v lt gy- pred lt gy,
lse-fri agg,abdt foss frag,inc
pred bryozoans,pelecepods,forams,
echinoids,tr mica, gd vis/inf por,
no fluor.

WOB:2-4 klbs
RPM:100
SPP:1900 psi
FLOW:910 gpm

216
(226)

Survey:216.7mMD(216.7mTVD)
0.73°inc 264.77°az

220
(220)

224
(224)

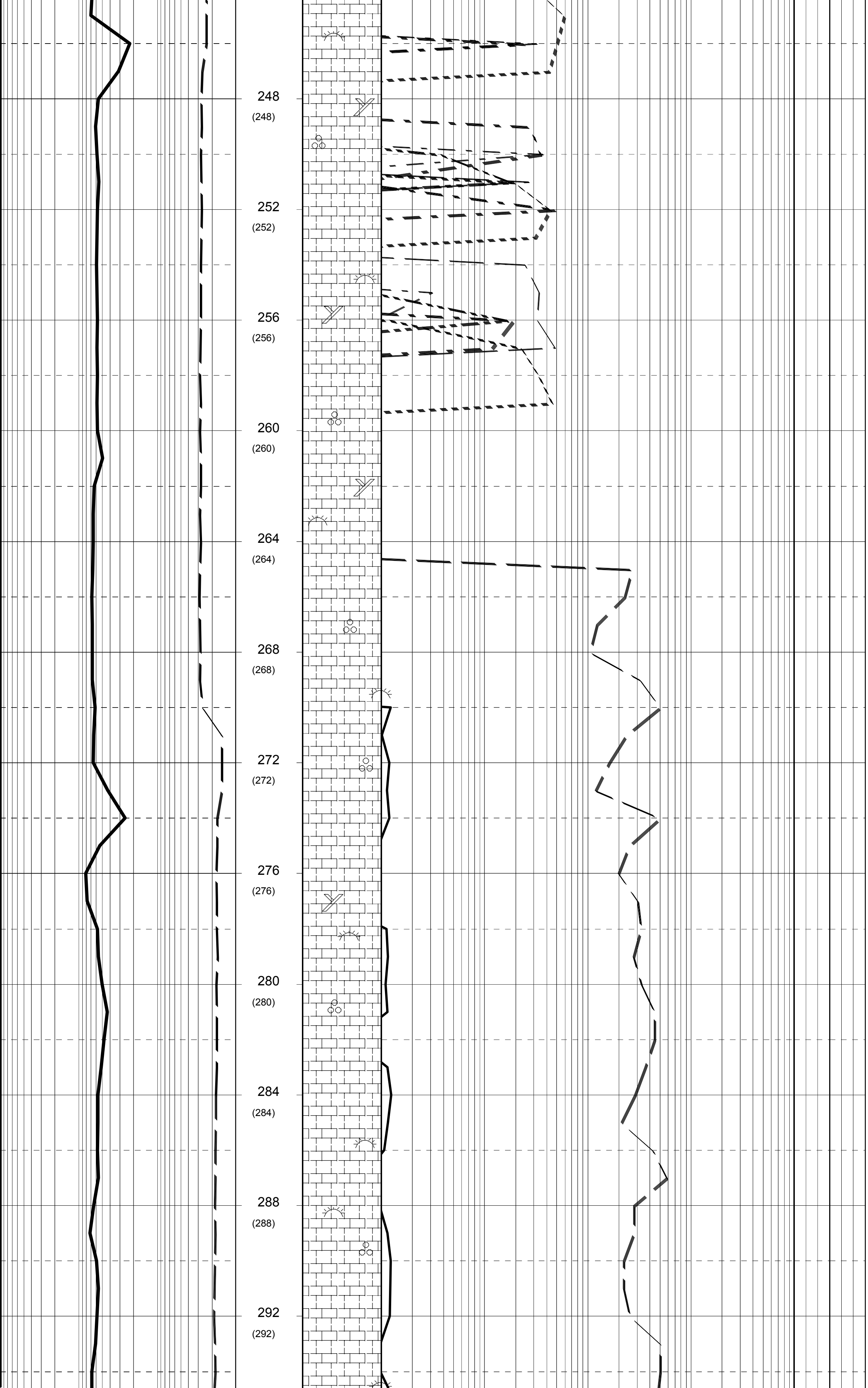
228
(228)

232
(232)

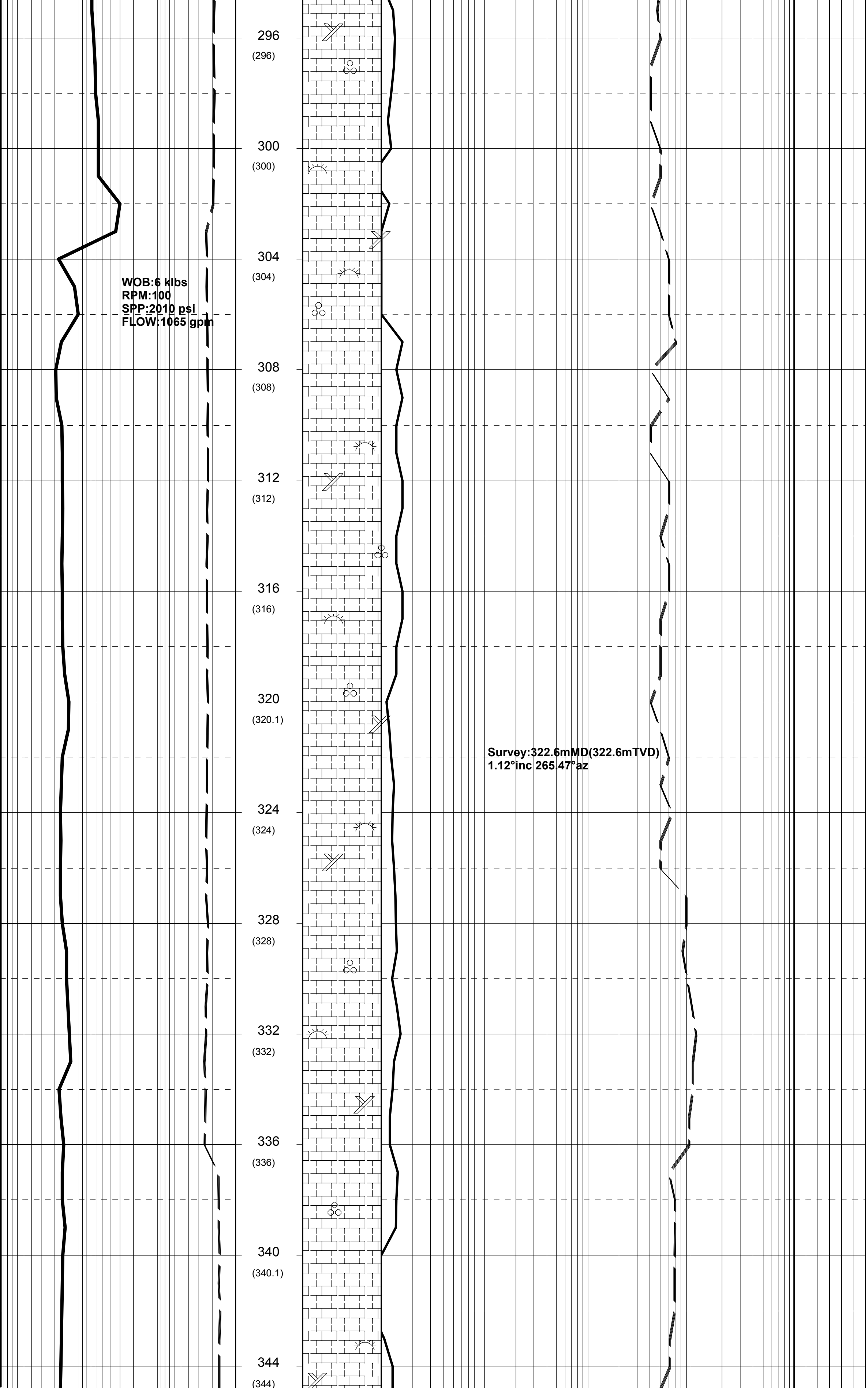
236
(236)

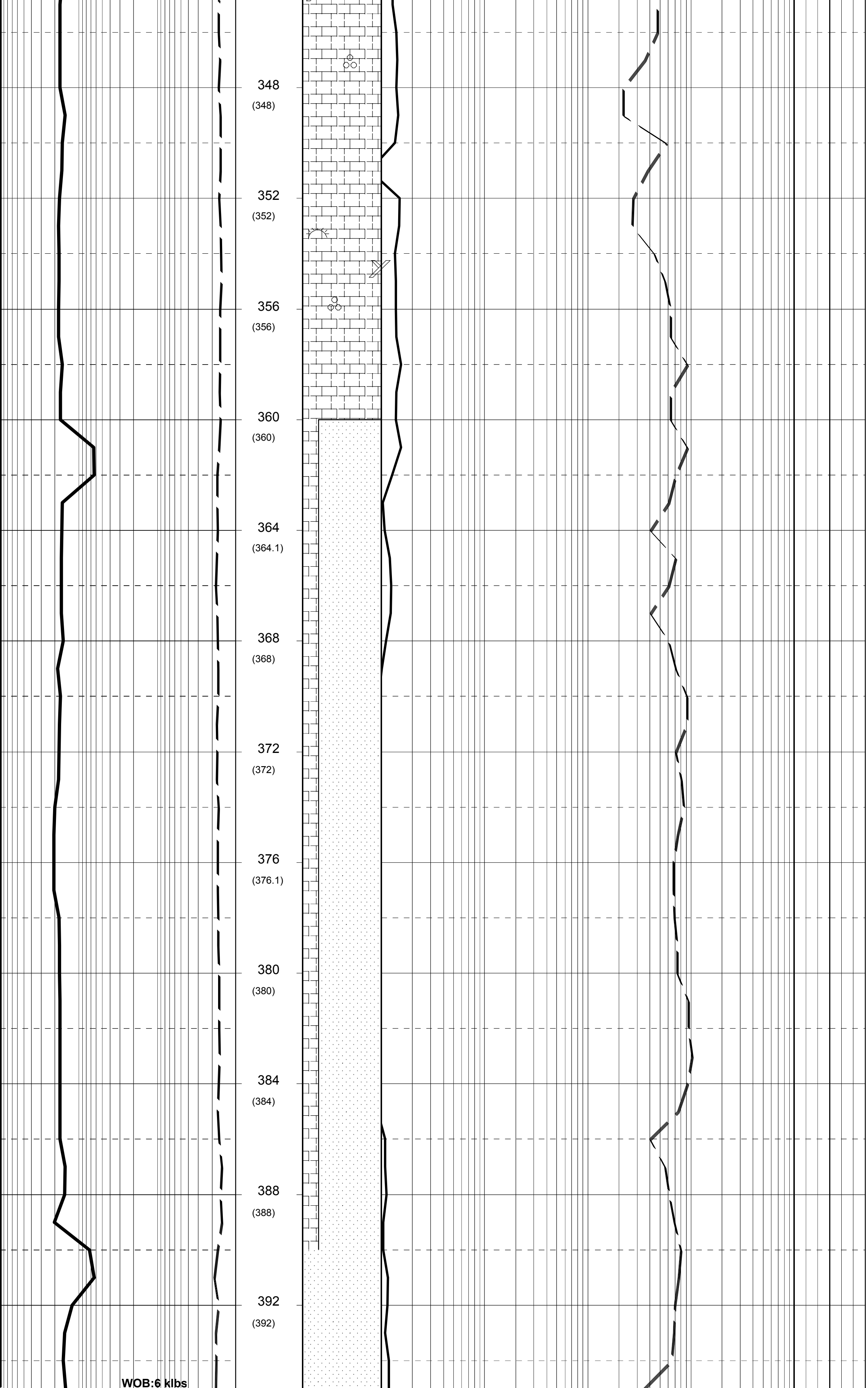
240
(240)

244

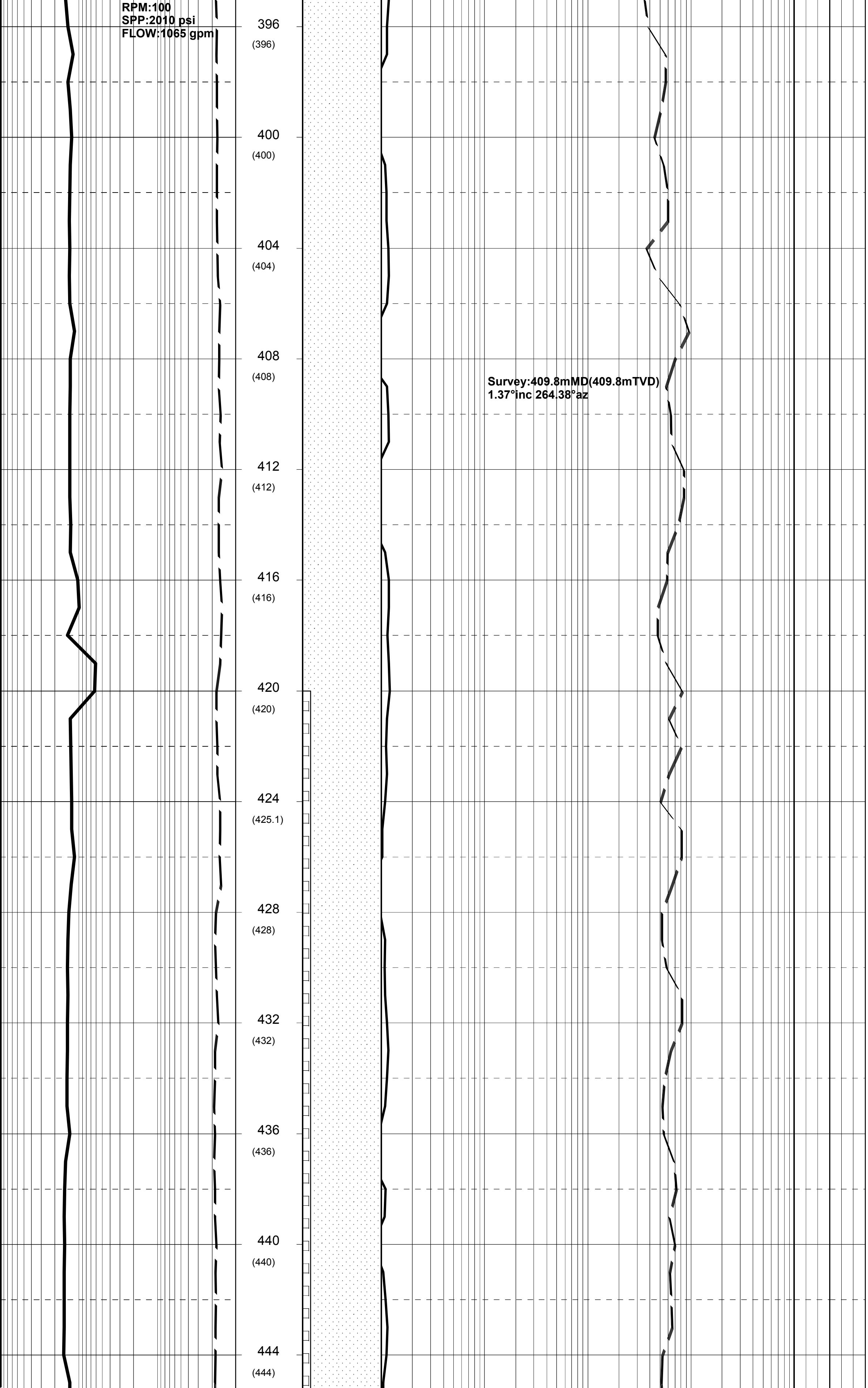


CALCARENITE:v lt gy- pred lt gy, lse-fri agg,abdt foss frag,inc pred bryozoans,pelecepods,forams, echinoids,tr mica, gd vis/inf por, no fluor.


296
(296)
300
(300)
304
(304)
WOB:6 klbs
RPM:100
SPP:2010 psi
FLOW:1065 gpm
308
(308)
312
(312)
316
(316)
320
(320.1)
Survey:322.6mMD(322.6mTVD)
1.12°inc 265.47°az
324
(324)
328
(328)
332
(332)
336
(336)
340
(340.1)
344
(344)



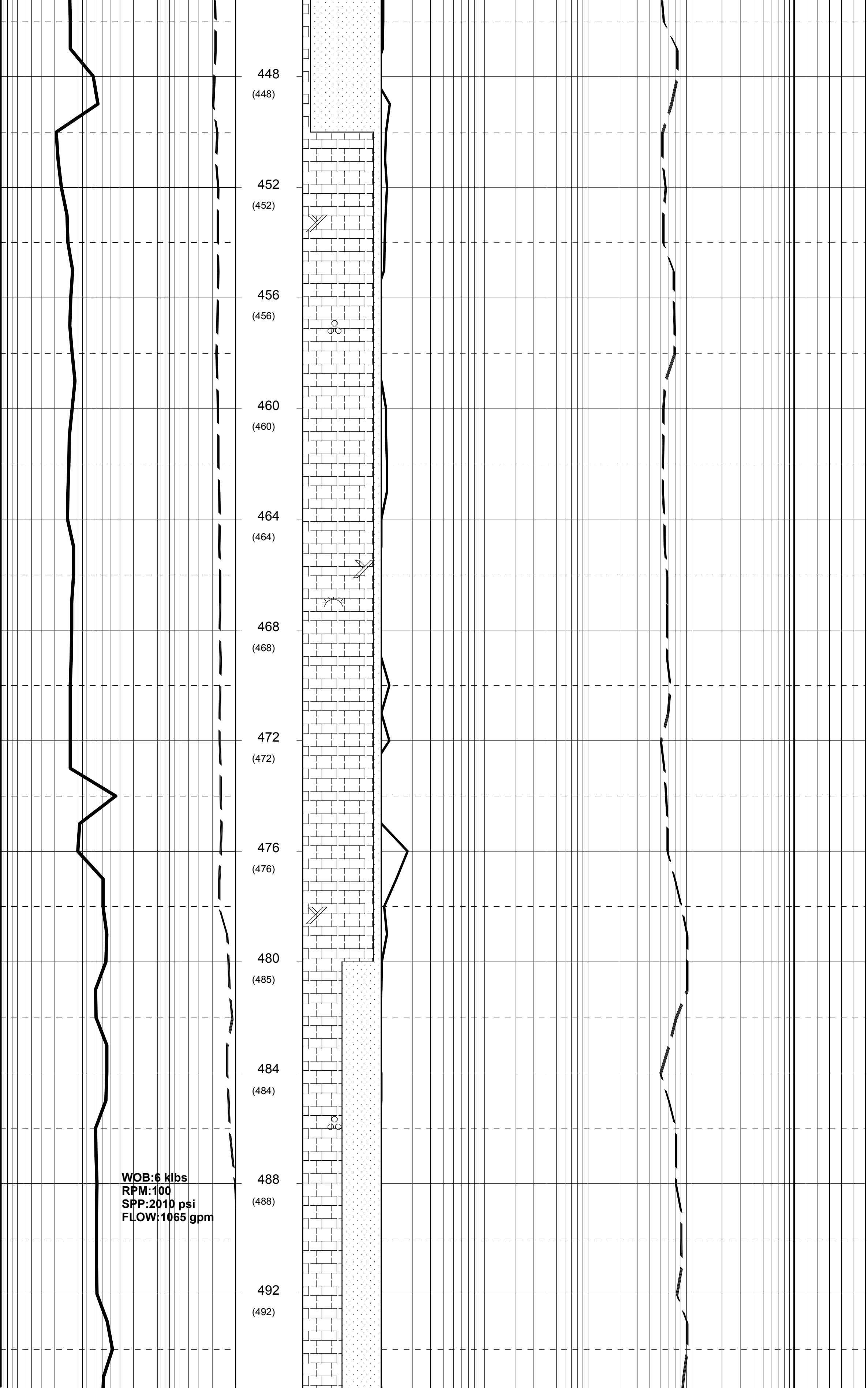
SANDSTONE:clr-trnsl,med-dk yelsh org stn,med -crs,pr srt,rnd-w rnd, wk calc/sil cmt,lse,v gd inf por, no fluor.



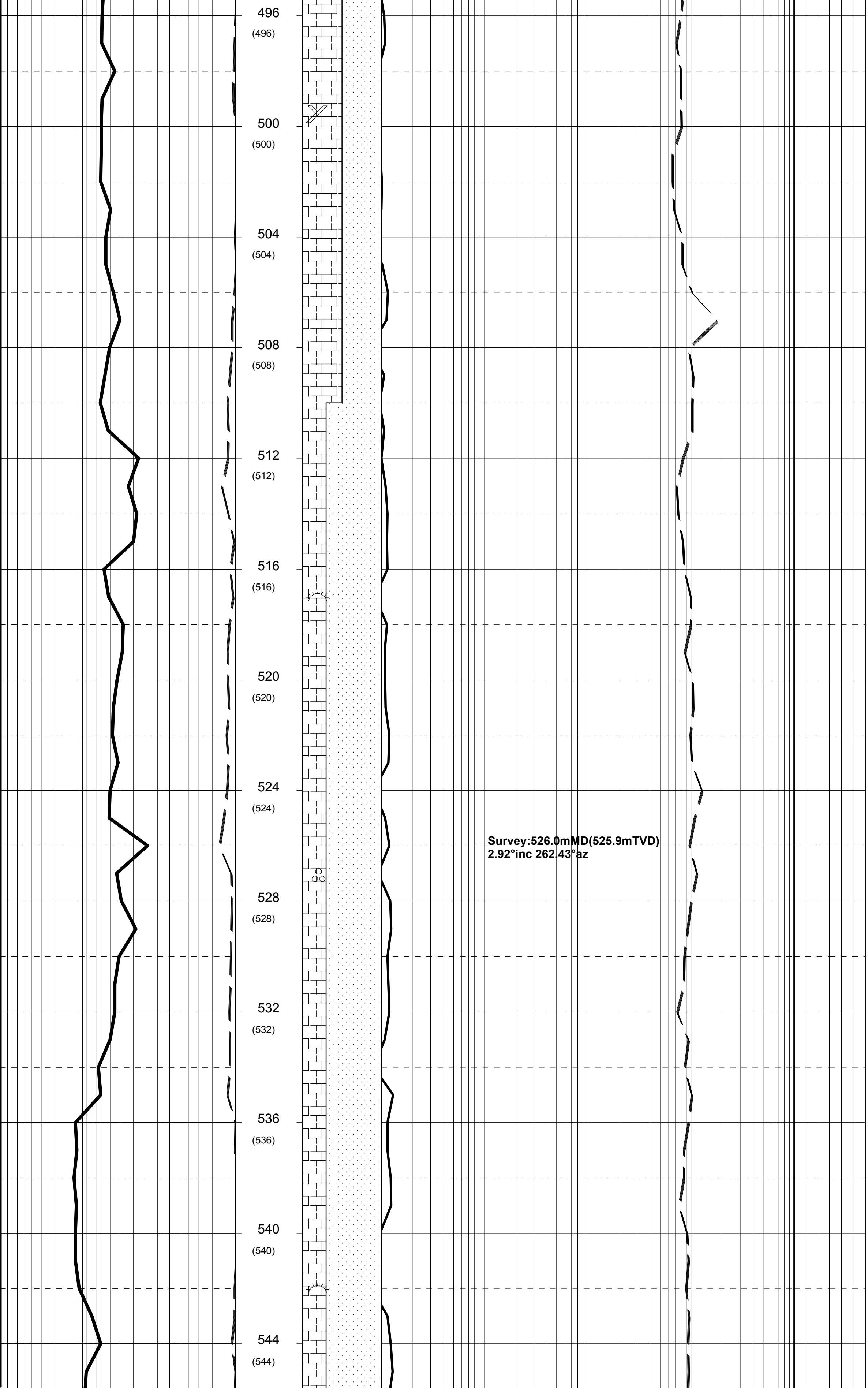
SANDSTONE:clr-trnsl,med-dk yelsh org stn,vf-crs dom f-med,pr srt,rnd, wk calc/sil cmt,lse,v gd inf por, no fluor.

CALCARENITE: off wh-lt gy,v fn-crs

grn,pr-mod srt,sub ang-sub rnd,
mod-wk calc cmt,foss frag,tr
glauc,fri- mod hd,n vis por,tr
min fluor,dull yel,n cut

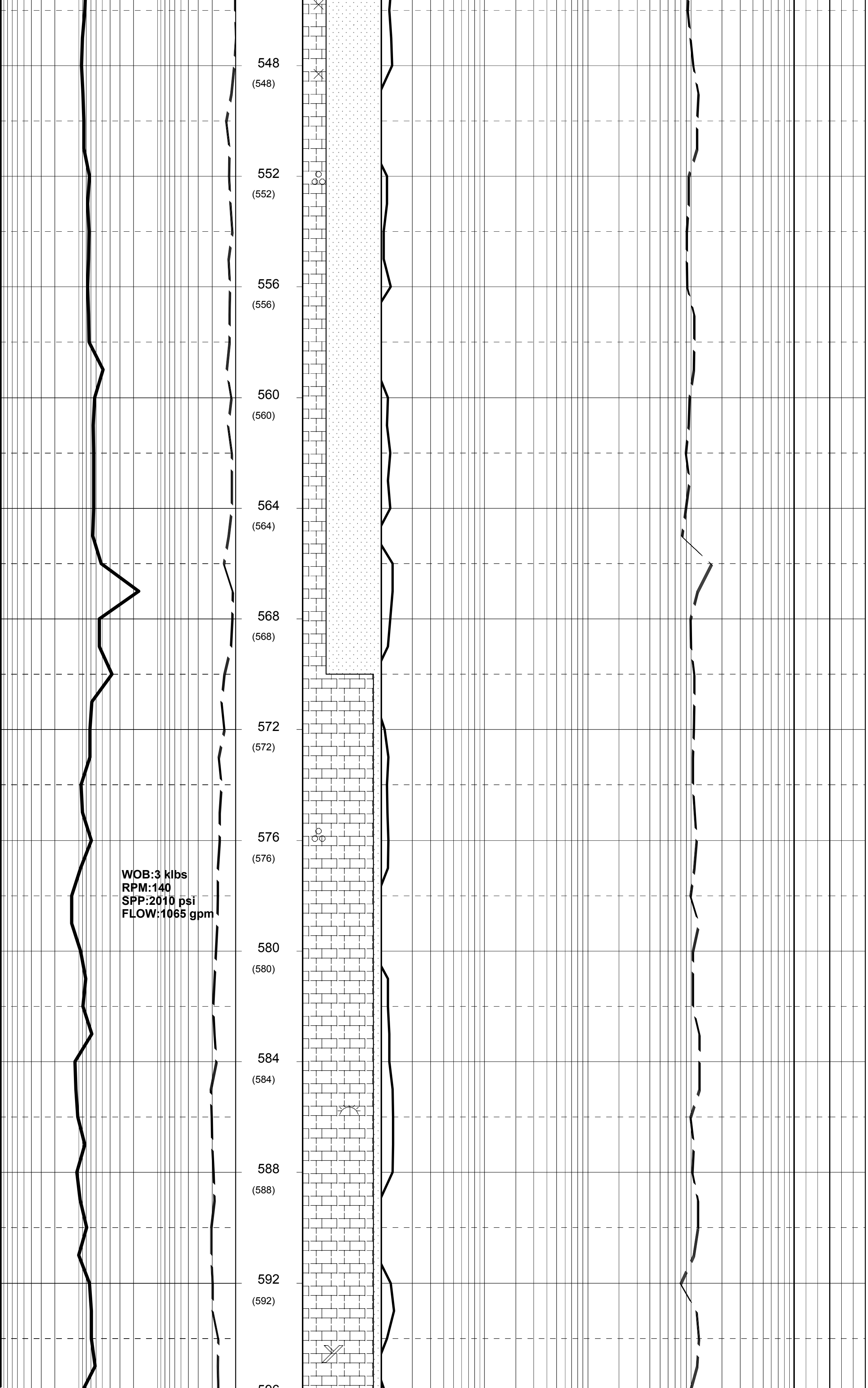


SANDSTONE:clr-trnsl,med-dk yelsh
org stn,vf-crs dom f-med,pr srt,rnd,
wk calc/sil cmt,lse,v gd inf por,
no fluor.

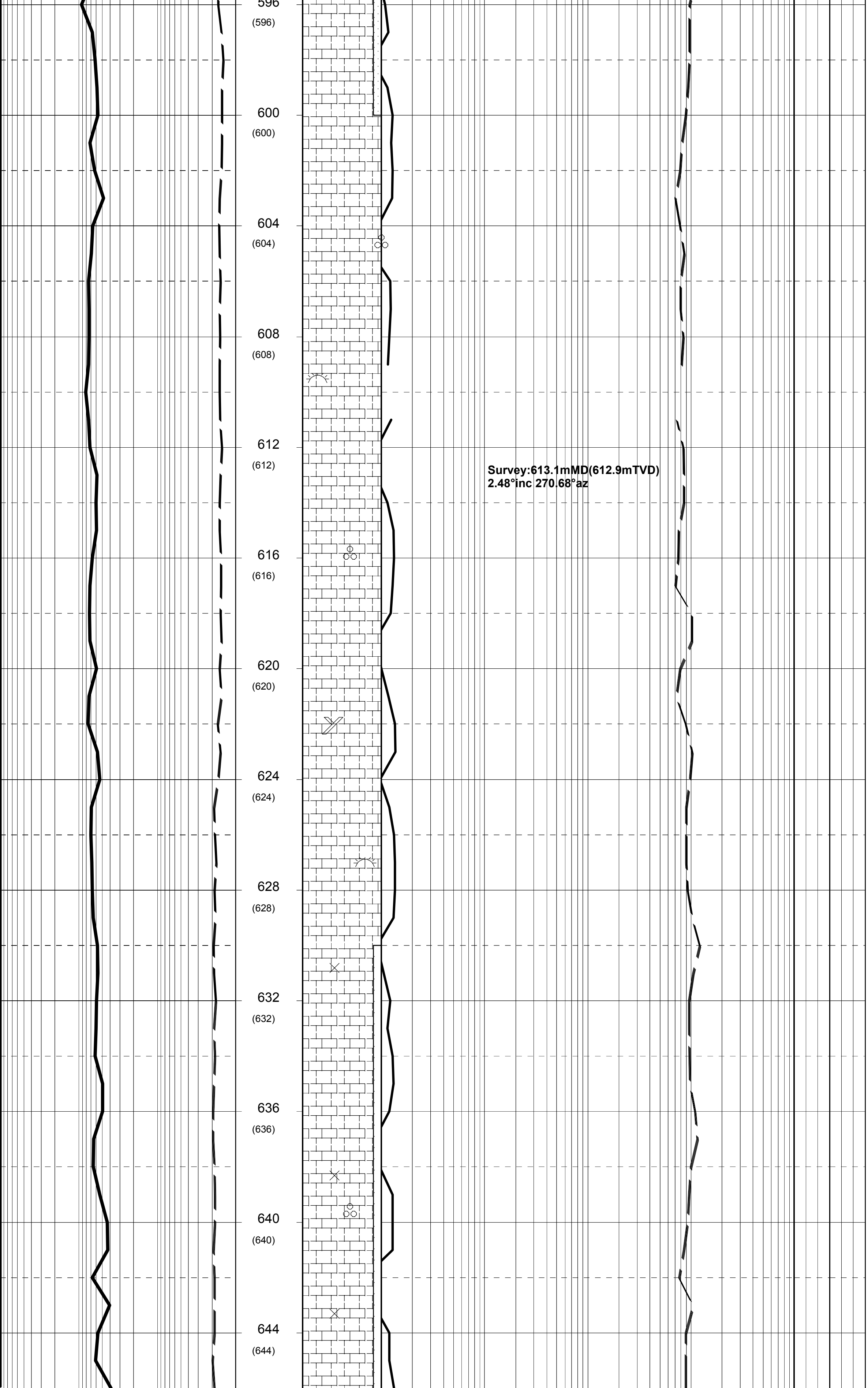


CALCARENITE:off wh-lt gy/bn, pred f occ crs,sa-sr,wk calc mtx,com foss frag,tr glauc.

CALCARENITE:off wh-pl gy/bn,pred fn,occ crs,sa-sr,wk calc mtx,com foss frag,tr glauc.

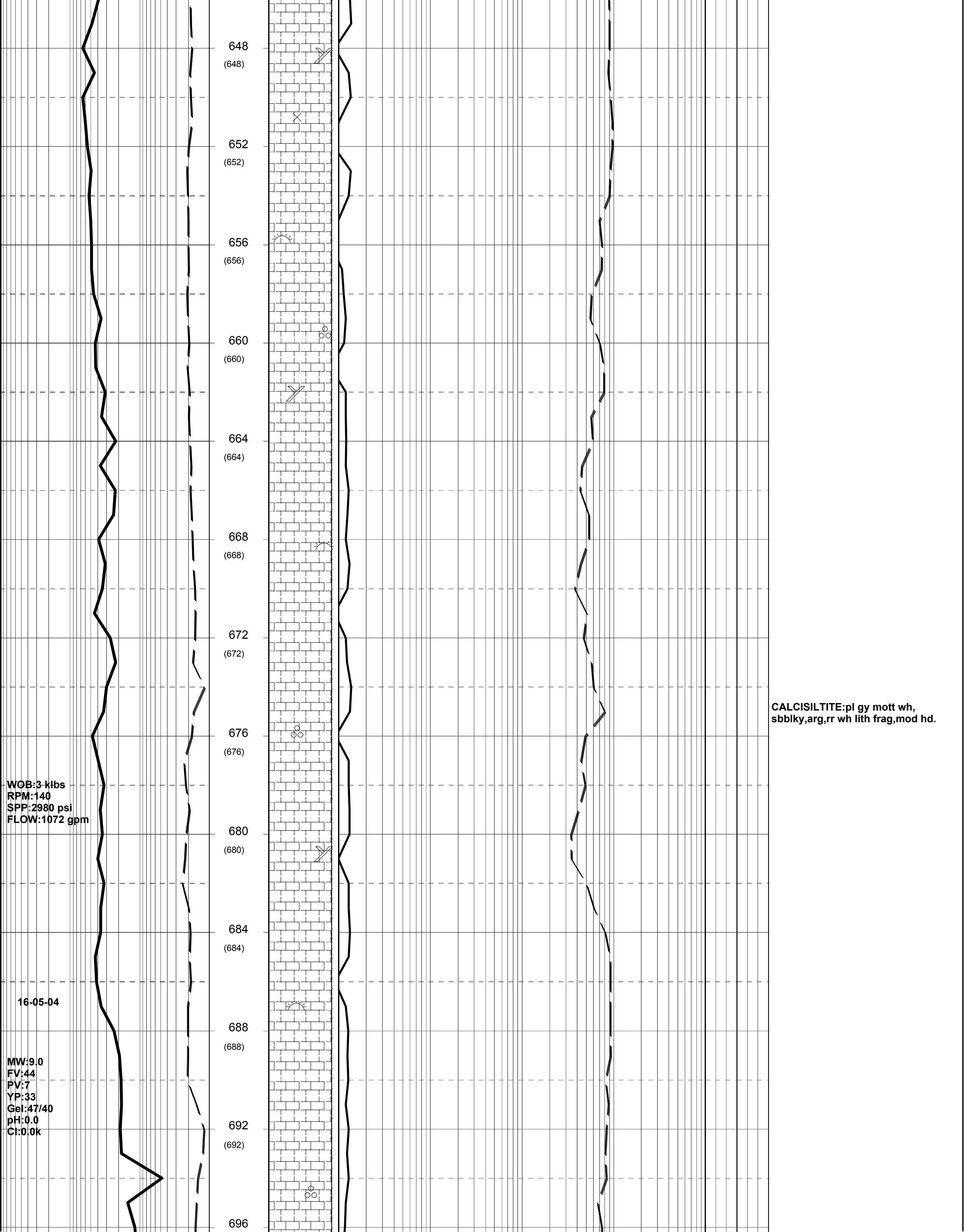


CALCARENITE:off wh-trnsl,vf-crs grn pred f-med grn,pr srt,sr-sa, wk cmt,tr lst frag,pr vis por.

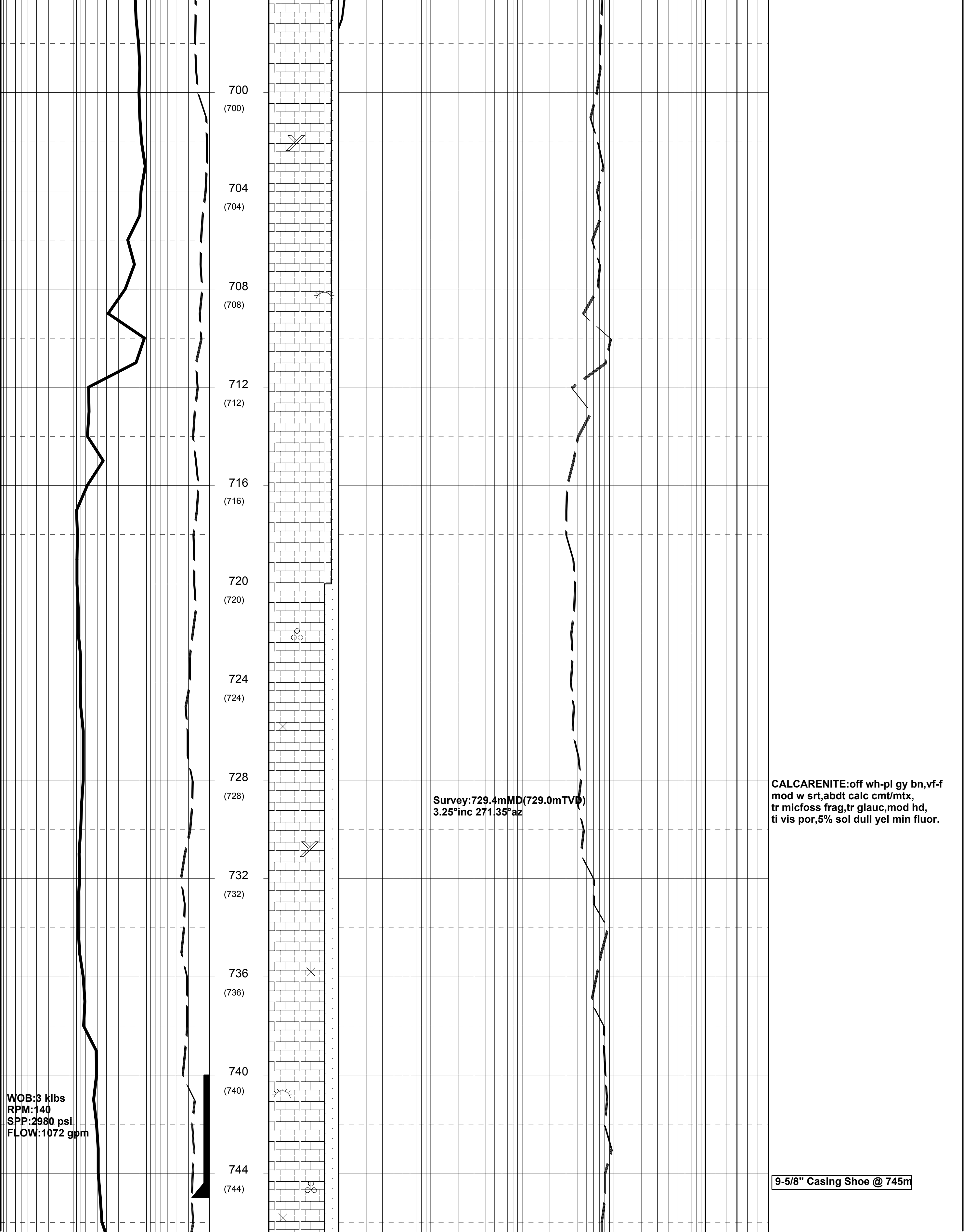


CALCARENITE:off wh-pa gy/bn,
v f-crs,sa-sr,abdt calc mtx,
mod hd- fri,com foss frag.

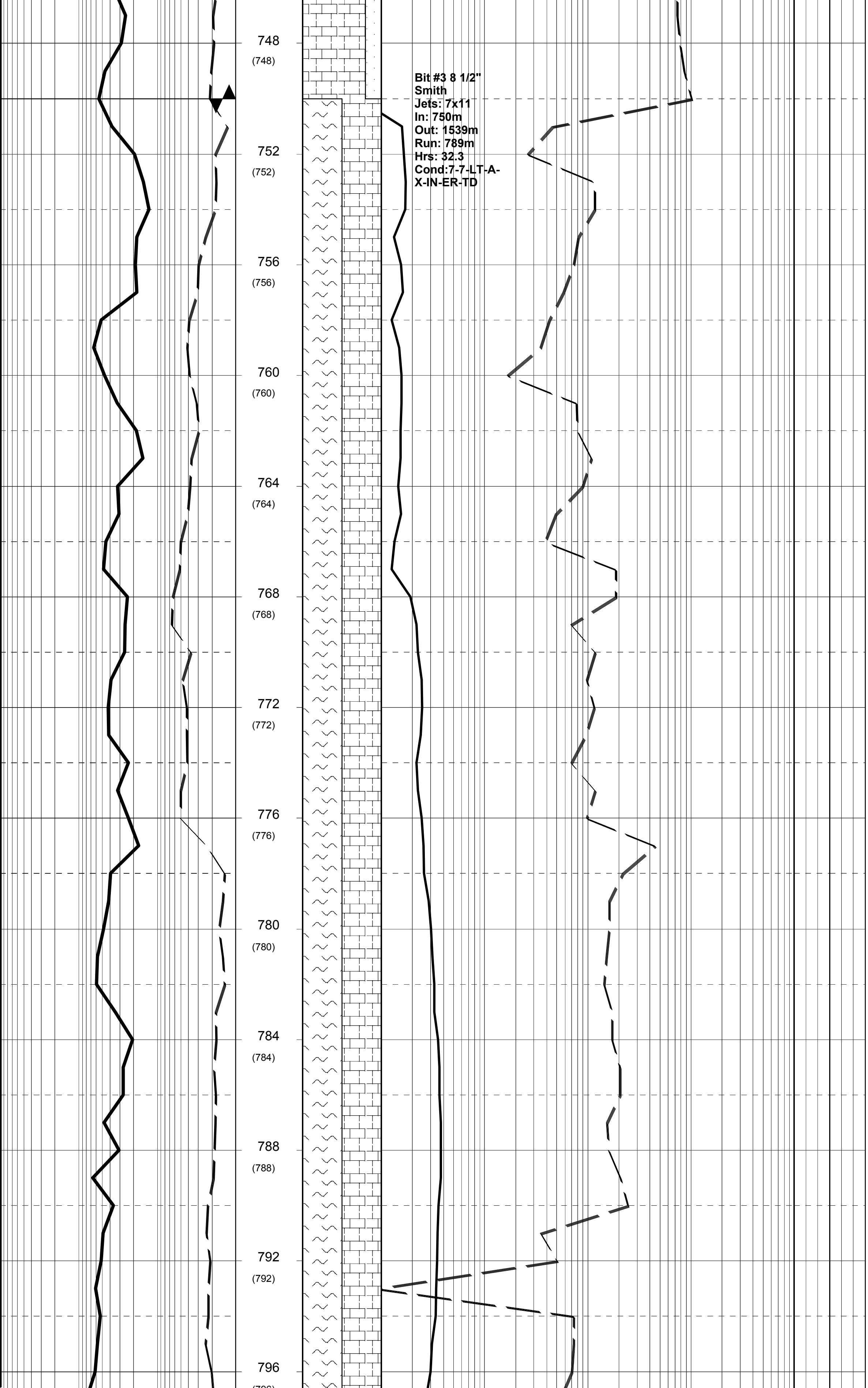
CALCARENITE:off wh-pl gy bn,vf-f
grn,mod w srt,abdt calc cmt/mtx,
tr micfoss frag,tr glauc,mod hd,
ti vis por,5% sol dull yel min fluor.



648
(648)
652
(652)
656
(656)
660
(660)
664
(664)
668
(668)
672
(672)
CALCISILTITE:pl gy mott wh, sbblky,arg,rr wh lith frag,mod hd.
676
(676)
WOB:3 klbs
RPM:140
SPP:2980 psi
FLOW:1072 gpm
680
(680)
684
(684)
16-05-04
688
(688)
MW:9.0
FV:44
PV:7
YP:33
Gel:47/40
pH:0.0
Cl:0.0k
692
(692)
696

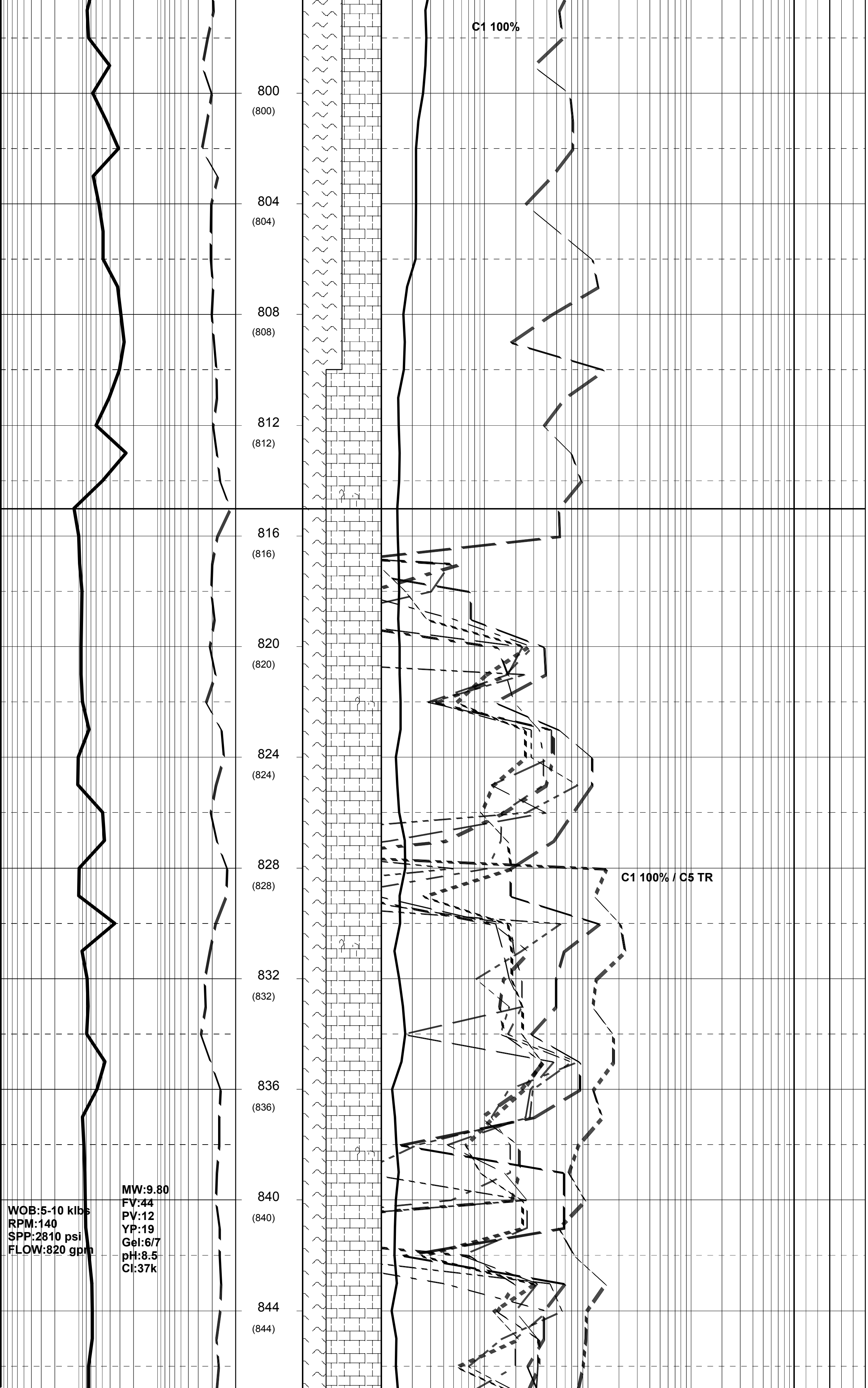


700
(700)
704
(704)
708
(708)
712
(712)
716
(716)
720
(720)
724
(724)
728
(728)
Survey:729.4mMD(729.0mTVD)
3.25°inc 271.35°az
CALCARENITE:off wh-pl gy bn,vf-f
mod w srt,abdt calc cmt/mtx,
tr micfoss frag,tr glauc,mod hd,
ti vis por,5% sol dull yel min fluor.
732
(732)
736
(736)
740
(740)
WOB:3 klbs
RPM:140
SPP:2980 psi
FLOW:1072 gpm
744
(744)
9-5/8" Casing Shoe @ 745m



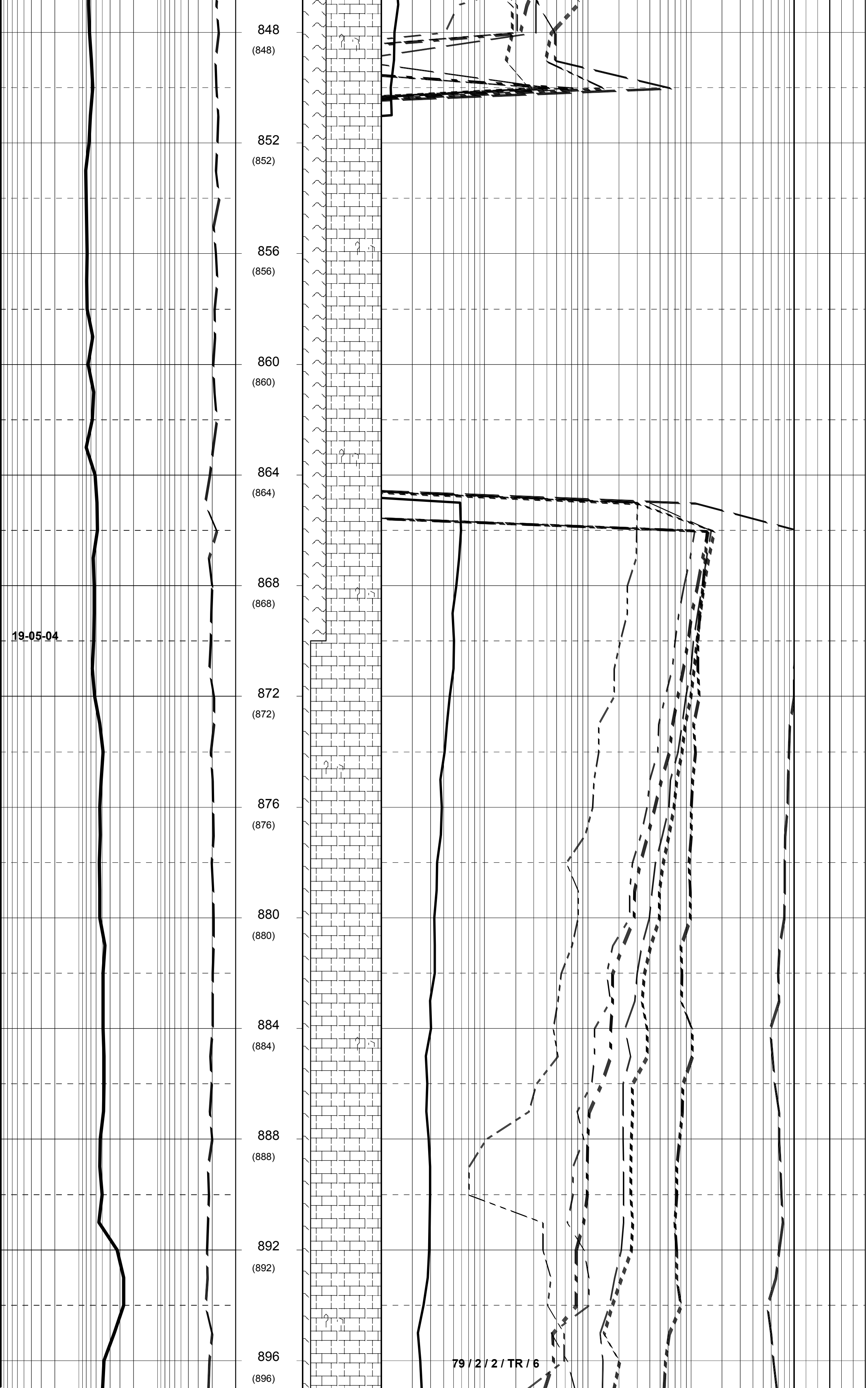
CALCISILTITE:pl gy mott wh, sbblky,arg,rr wh lith frag,mod hd.

CALCISILTITE:gy-bn gy,sr,g/t MARL blky i/p,occ sa,frm occ sft,occ foss frag,tr glauc,no flour.



CALCISILTITE:pl gy-off wh,sr,
blky i/p,occ sa,frm,occ sft,
occ foss frag,tr glauc,no flour.

LAKES ENTRANCE:815m(SS:-776m)

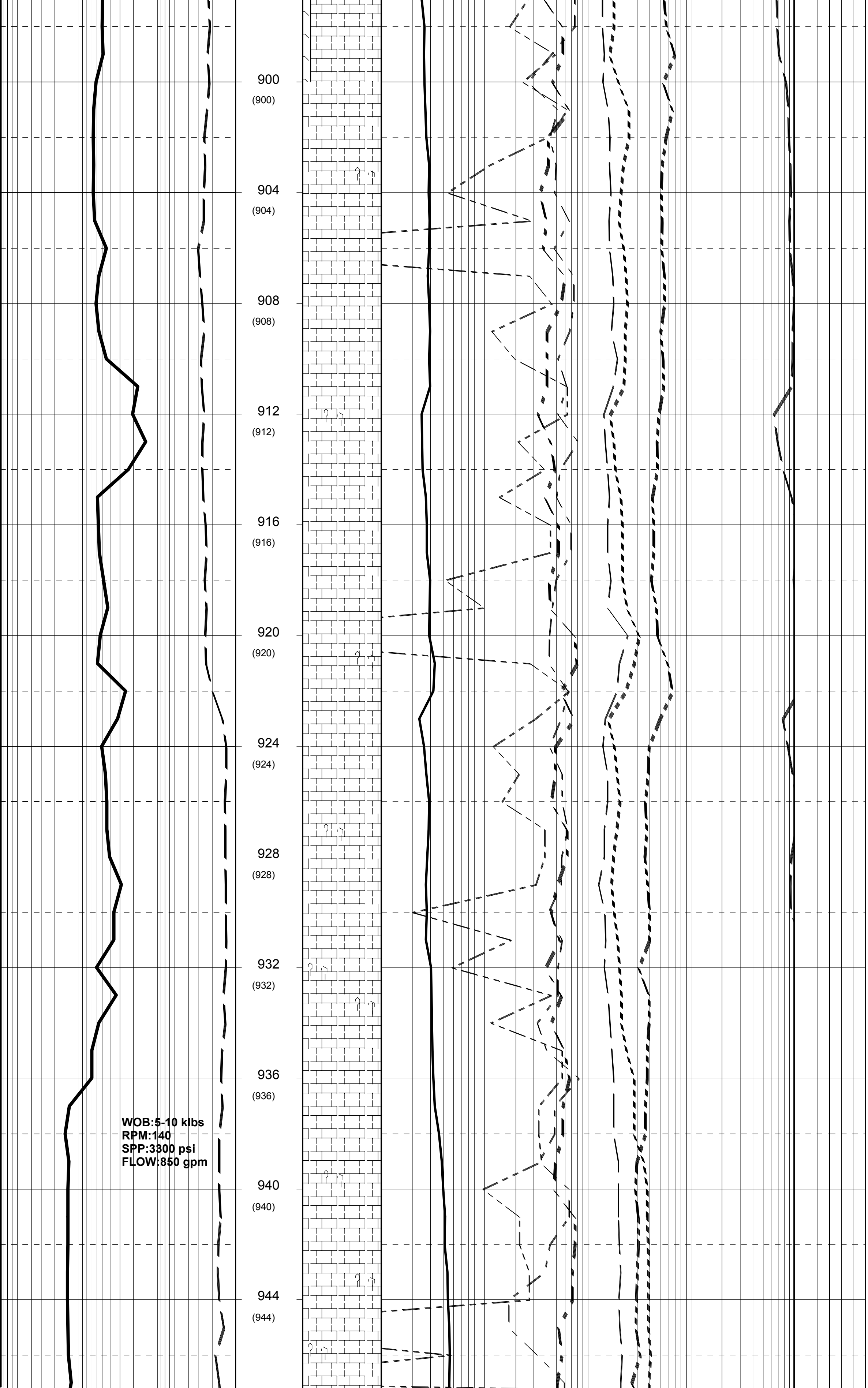


Inject test gas through degasser clear debris from suction head

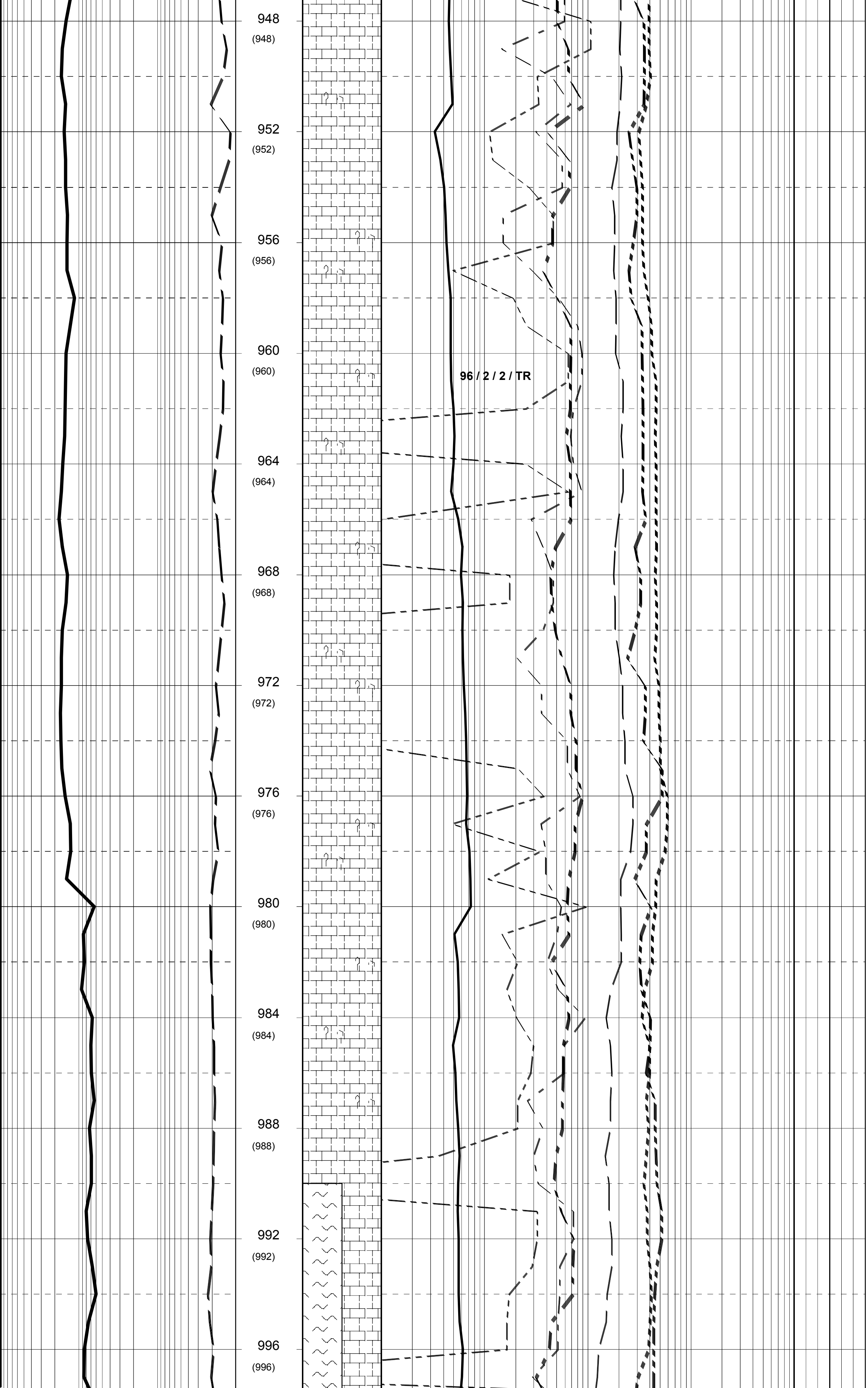
CALCISILTITE:pl gy-off wh,arg,sr, blky i/p,occ sa,frm,occ sft, occ foss frag,tr glauc.

CALCISILTITE:med gy,v arg,g/t MARL i/p,slty i/p,frm-fri,occ sft,sbblky.

79 / 2 / 2 / TR / 6

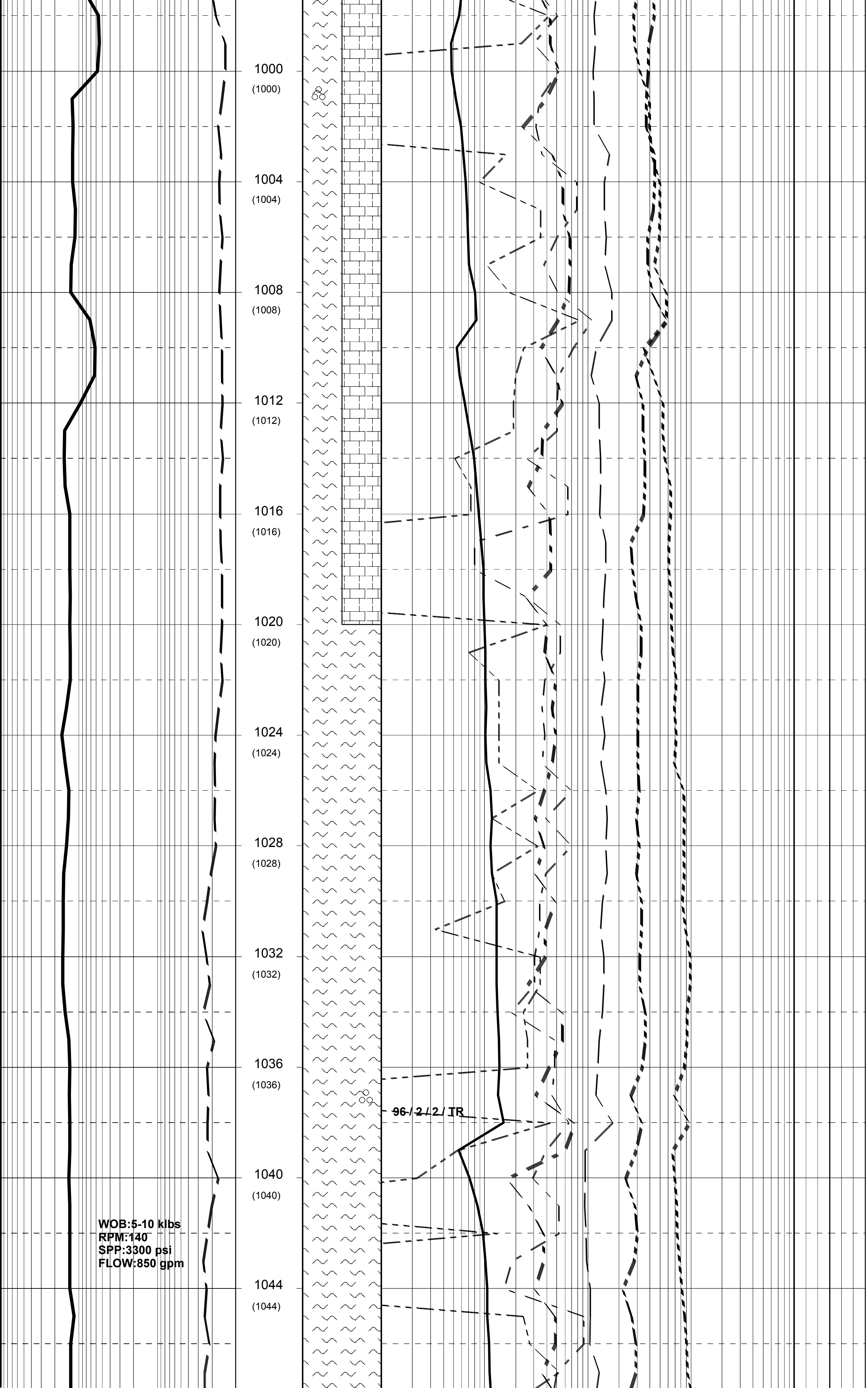


CALCISILTITE:med gy,v arg, slty i/p,frm-fri,occ sft, sbblky.



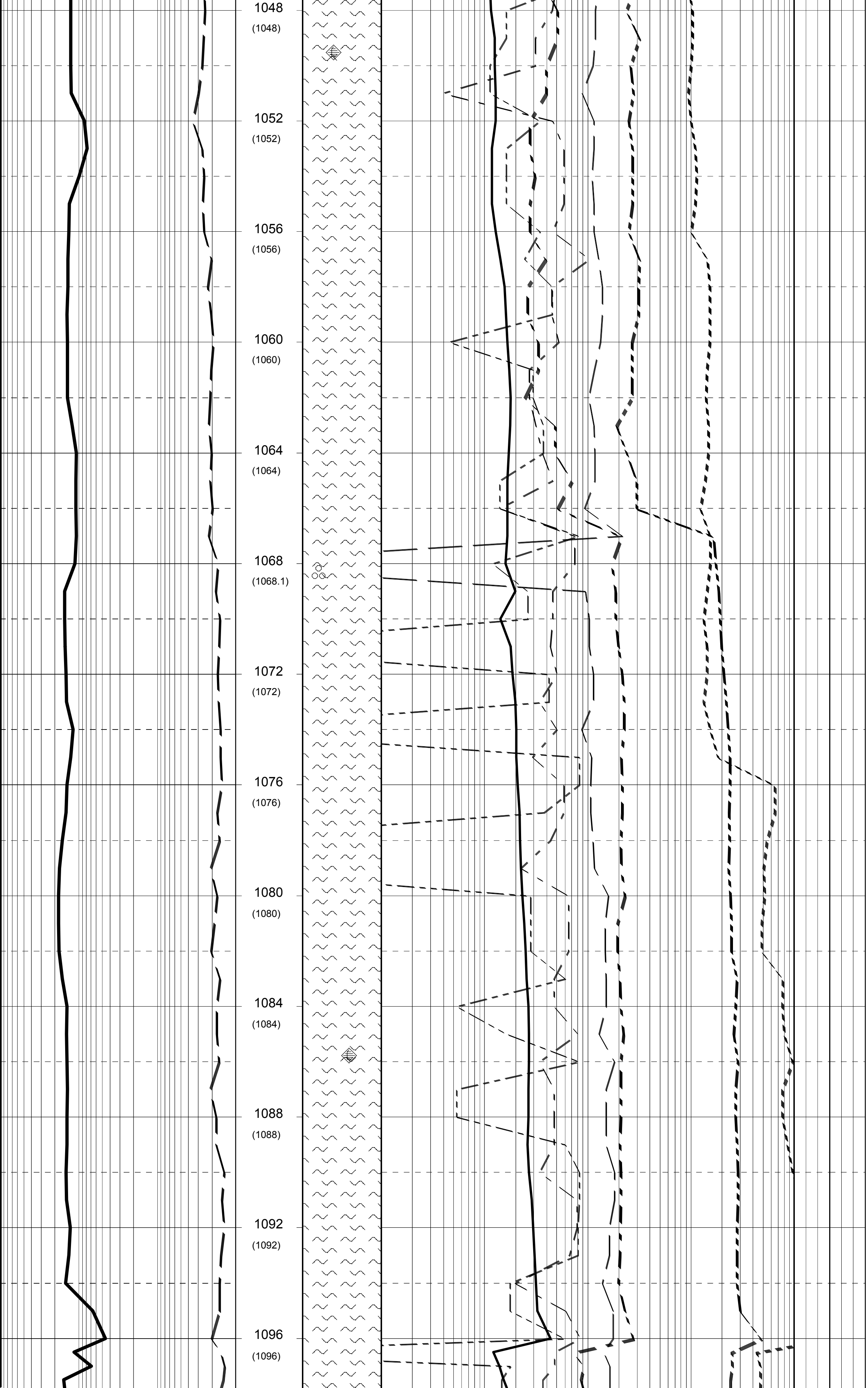
CALCISILTITE:med gy,v arg, slty i/p,frm-fri,occ sft, tr pyr,tr glauc,sbblky.

CALCISILTITE:lt-med gy,v arg, sft-frm,sbblky-blky,slty i/p, g/t arg CLSLT,tr pyr,tr glauc, tr forams.



MARL:lt-med gy-lt-med gnsh gy, arg,tr foss,tr pyr,sbblky-blky.

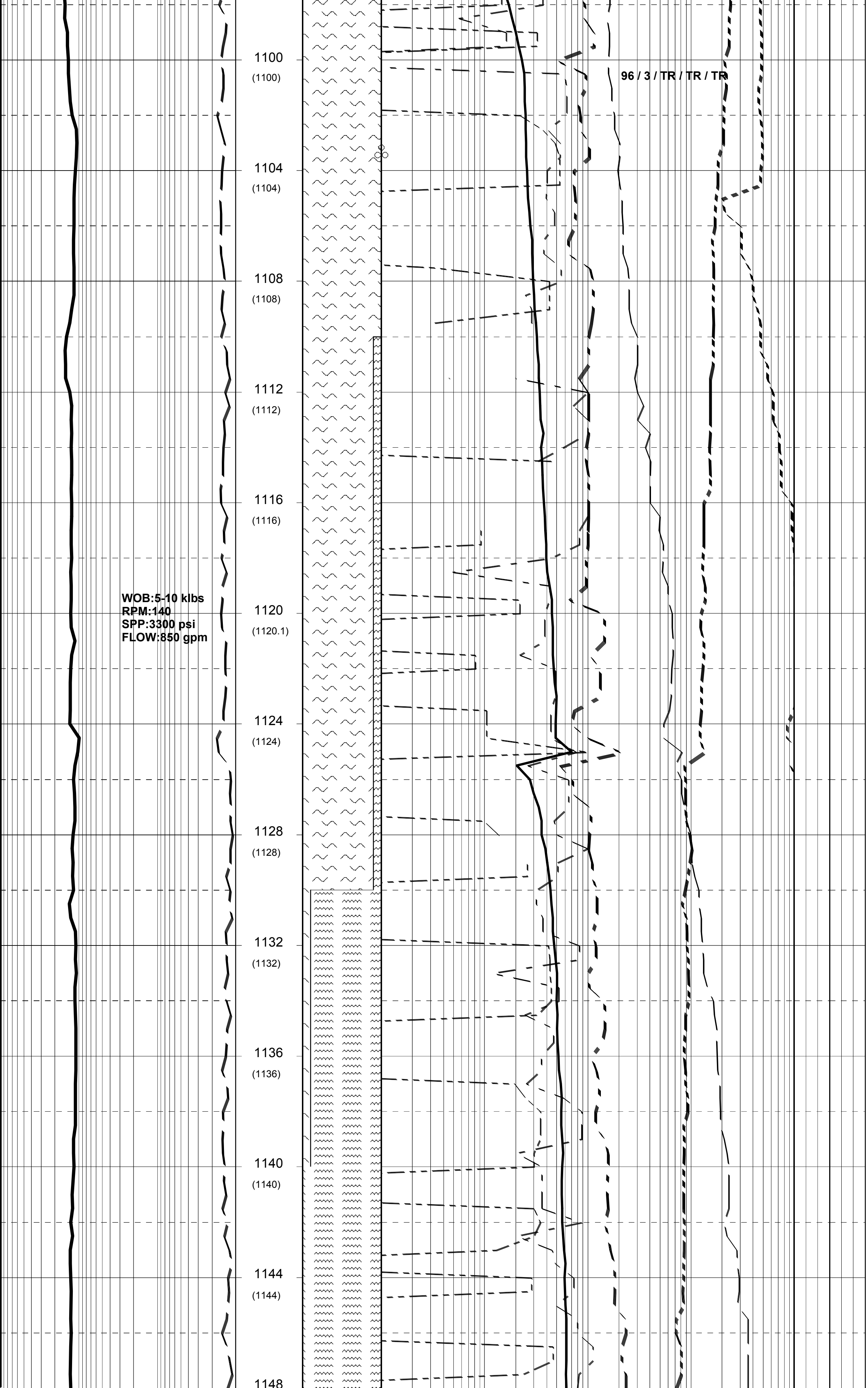
MARL:lt-med gy-V lt gnsh gy, v sft-sft rr frm,sbblky,arg,tr foss,tr nod glauc.



MARL:lt-med gy-V lt gnsh gy, v sft-sft rr frm,sbblky,arg,tr foss,tr nod glauc.

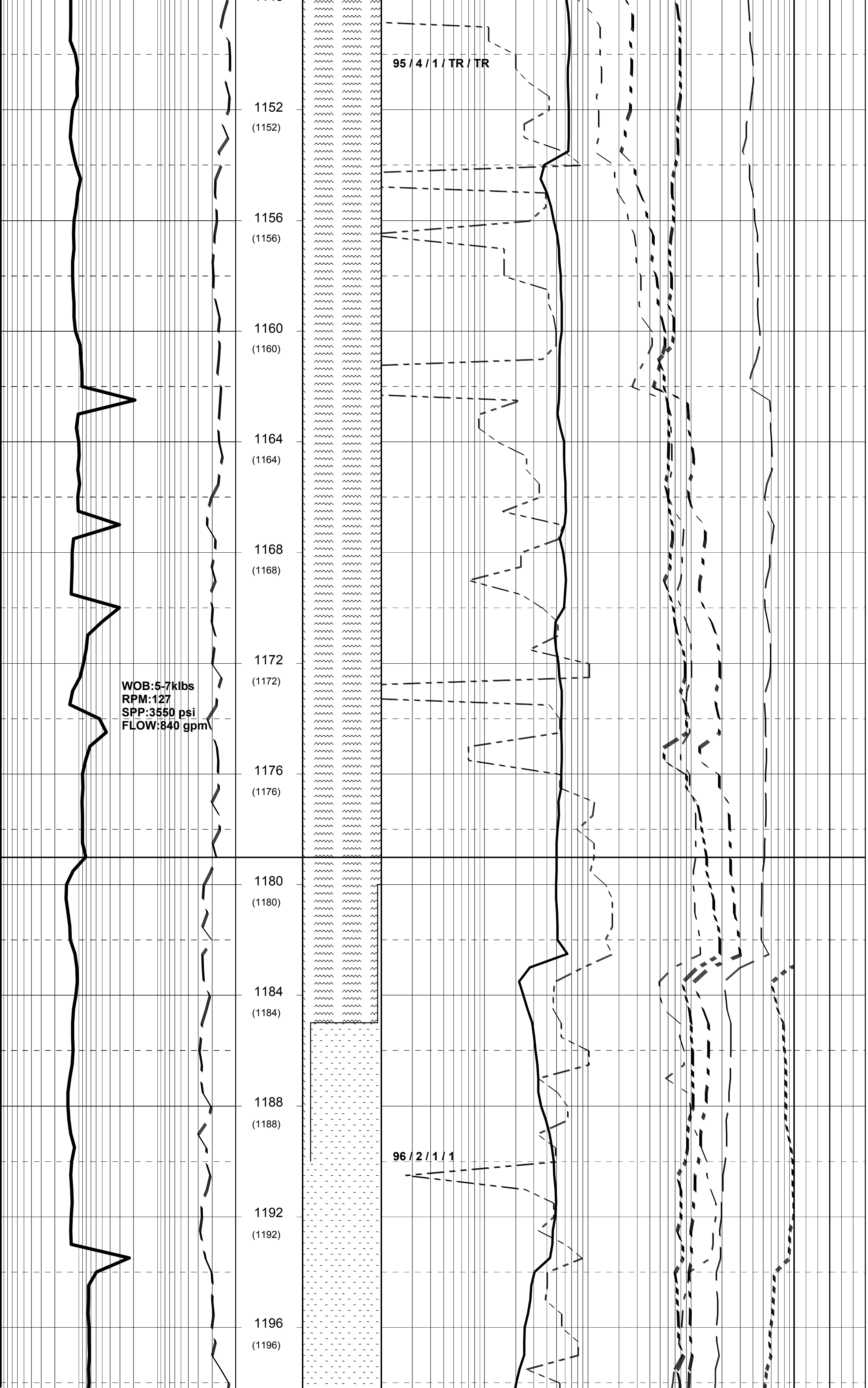
Carbide Lag Check @ 1067m

MARL:lt-med gy-v lt gnsh gy occ bnsh gy,sft-rr frm,sbblky occ blky,rr slty, tr foram,tr nod glauc,rr pyr.



MARL:lt-med gy-v lt gnsh gy occ bnsh gy bec off wh,sft-rr frm,sbblky, tr foram,tr nod glauc,rr pyr.

SILTSTONE:bnsh gy,v sft-sft,arg, calc-v calc,tr carb spks,rr diss pyr,glauc i/p.

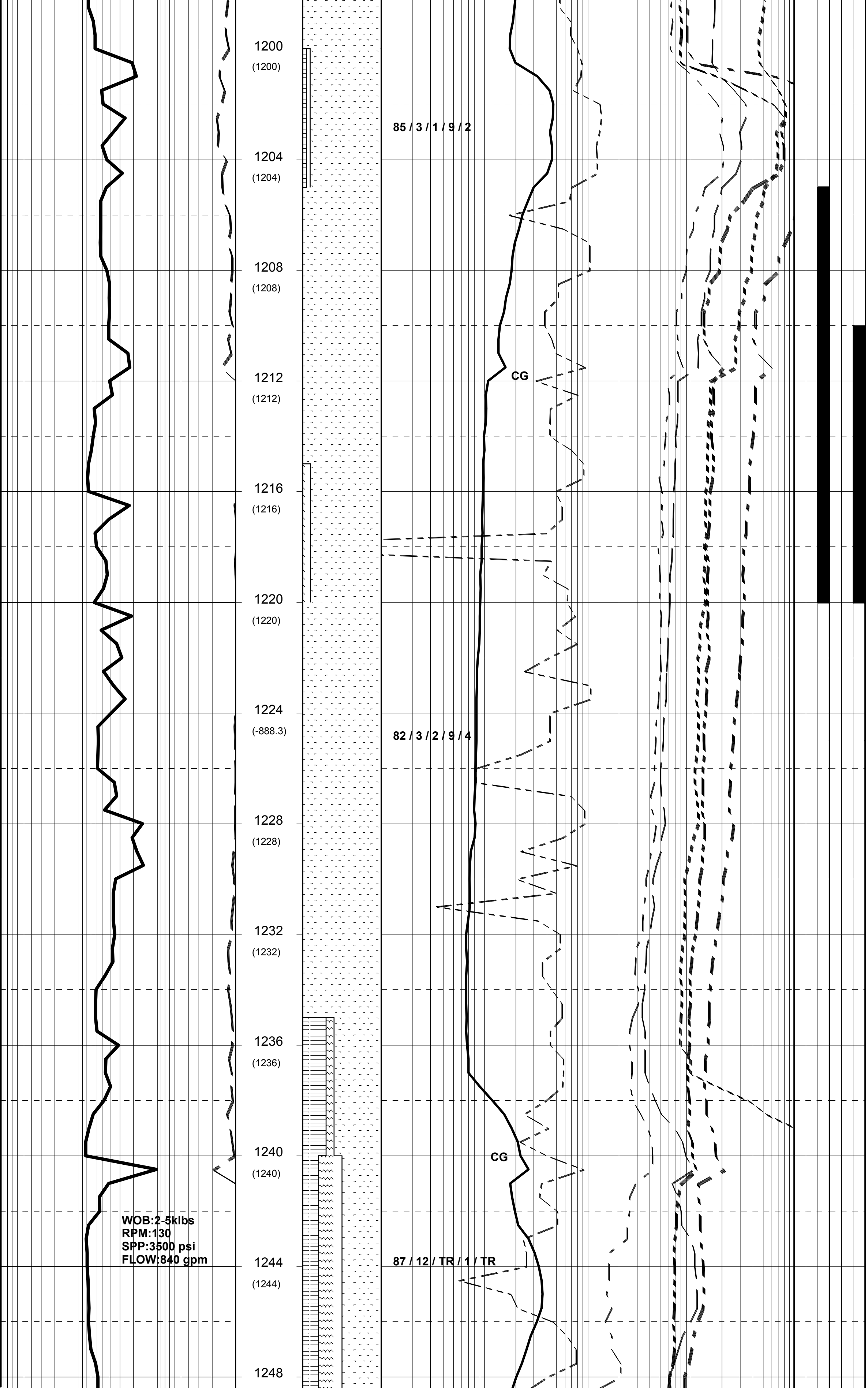


SILTSTONE:bnsh gy-dk bnsh,v sft-sft,sbblky,arg,v calc,tr carb spks, rr diss/nod pyr,v glauc i/p.

LATROBE GROUP:1179m(SS:-1140m)

SANDSTONE:lt gy,f-v crs,pr srt, sub ang-sub rnd,wk-mod sil cmt, wh arg mtx,com glauc,tr mica, fr inf por,no flour.

SANDSTONE:lt gy,f-v crs,v pr srt, sa-sr,wk-mod sil cmt,com wh arg mtx, com glauc,tr-com mic,lse clr-trnsl grn,gd inf por,no fluor.



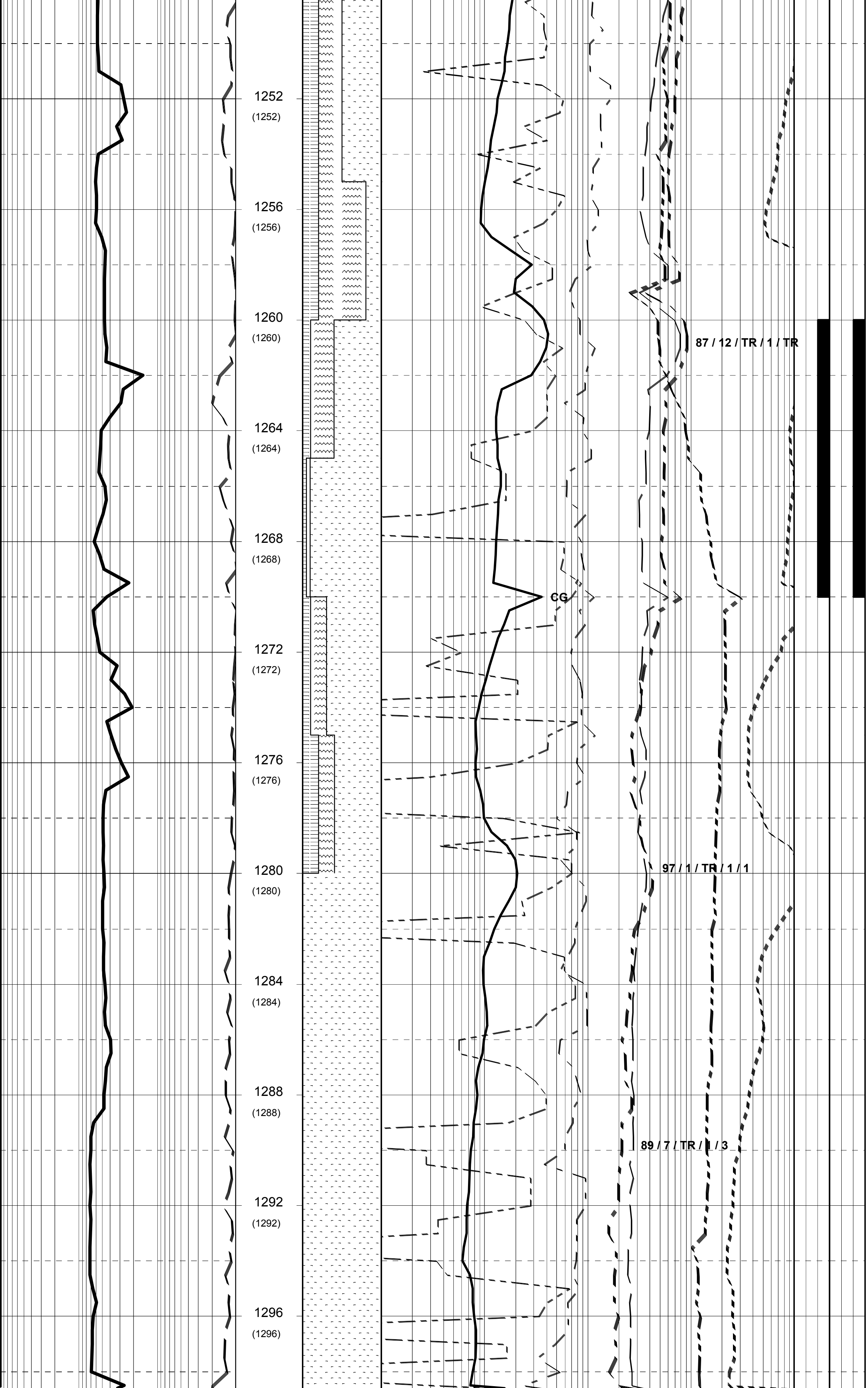
SILTSONE:pa-med gy & bn,arg,com carb lam,occ carb spks,tr mica, frm,sbblky.
COAL:blk,dull,sbconch frac.

SANDSTONE: trnsl-off wh,f-v cr,pr srt sr-sa,wk sil cmt,abdt qtz ovgth,tr wh slty mtx,fri,gd inf por
FLUOR:1205m -1220m, 5% dc tr mod bri,yel,ptchy-sol fluor.slw diff to inst yel c/c,thn r/r.

SANDSTONE:trnsl-off wh,m-v crs,pr sr sa,wk-mod sil cmt,abdt qtz ovgths,gen cln,tr wh slty mtx,rr pyr & glauc nod fri-mod hd(where cmt),gd inf por,pr vis por,
FLUOR:a/a.

(1)SILTSTONE:pl-med brn,arg,com carb,lith & glauc frag,frm-mod hd,sbblky.

SANDSTONE:trans-pa bn,fn-crs,pred fn-med,mod srt,sa-sr,wk sil cmt, com bn slty mtx,fri,gd inf por, no flour.

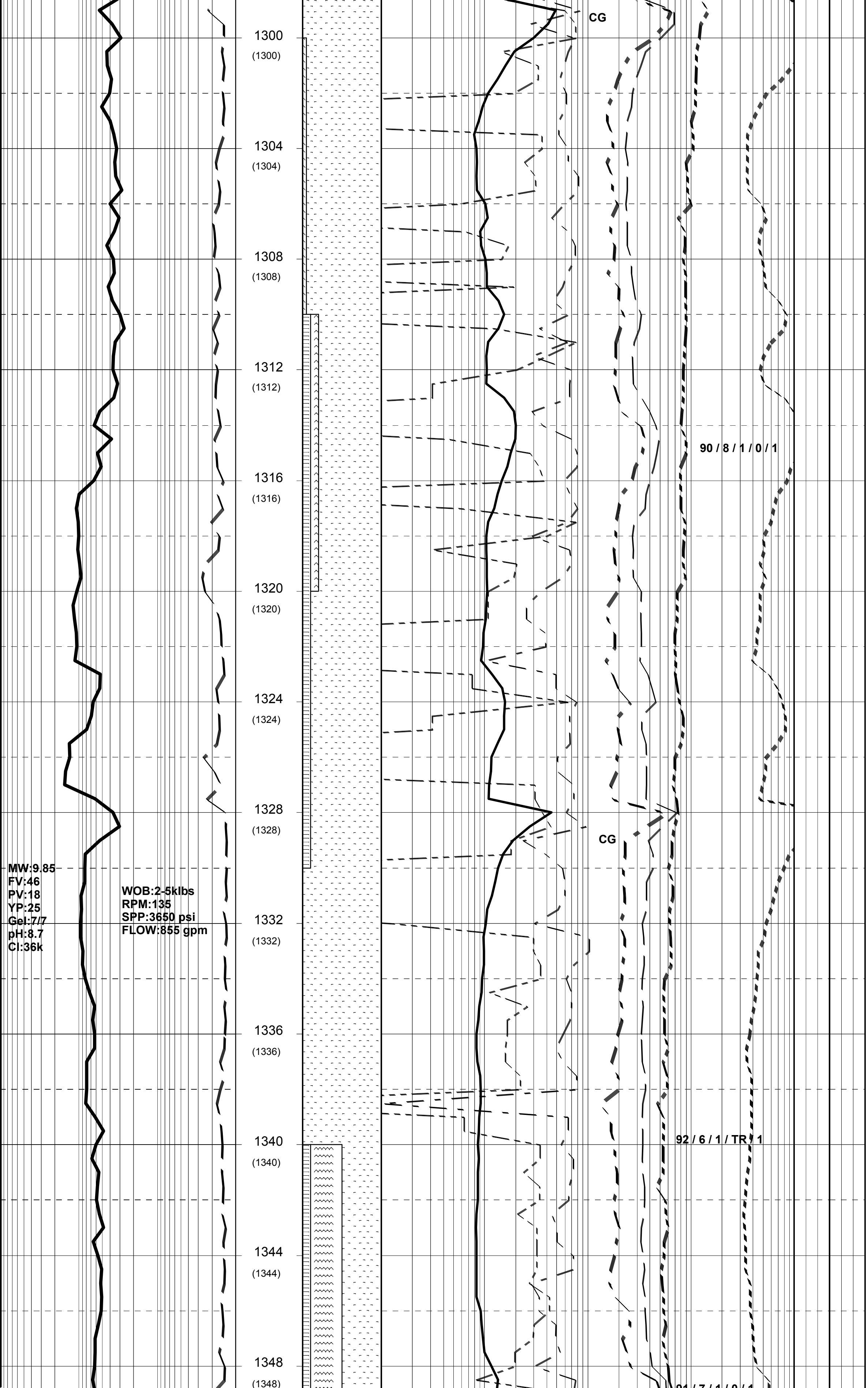


COAL:blk,dull,grd to carb sltst,britt, blky.

(2)SILTSTONE:v pa gn-gy,aren gd to vf sst,com lithic frag,mod hd, subblky.

SANDSTONE:pa gy-bn,off wh,vf-med occ crs,mod srt,sa-rnd,mod-wk sil & calc cmt,wh slty mtx,tr glauc, fri-mod hd,tr inf pr.
FLOUR:1260-1270,5%-tr,dul,sld,yel flour,slow c/c,thn yel-wh flm res.

SANDSTONE:clr-trnsl,med-v crs,pr srt,sa-ang,wk sil cmt,abdt,qtz o/g,fri,gd-v gd inf pr,no fluor.



10m SAMPLES FROM 1300m

SANDSTONE:trnsl-off wh,f-v crs,pr srt sa-sr,wk sil cmt,abd qtz ovgths,cln, fri,gd -exc inf por,no fluor

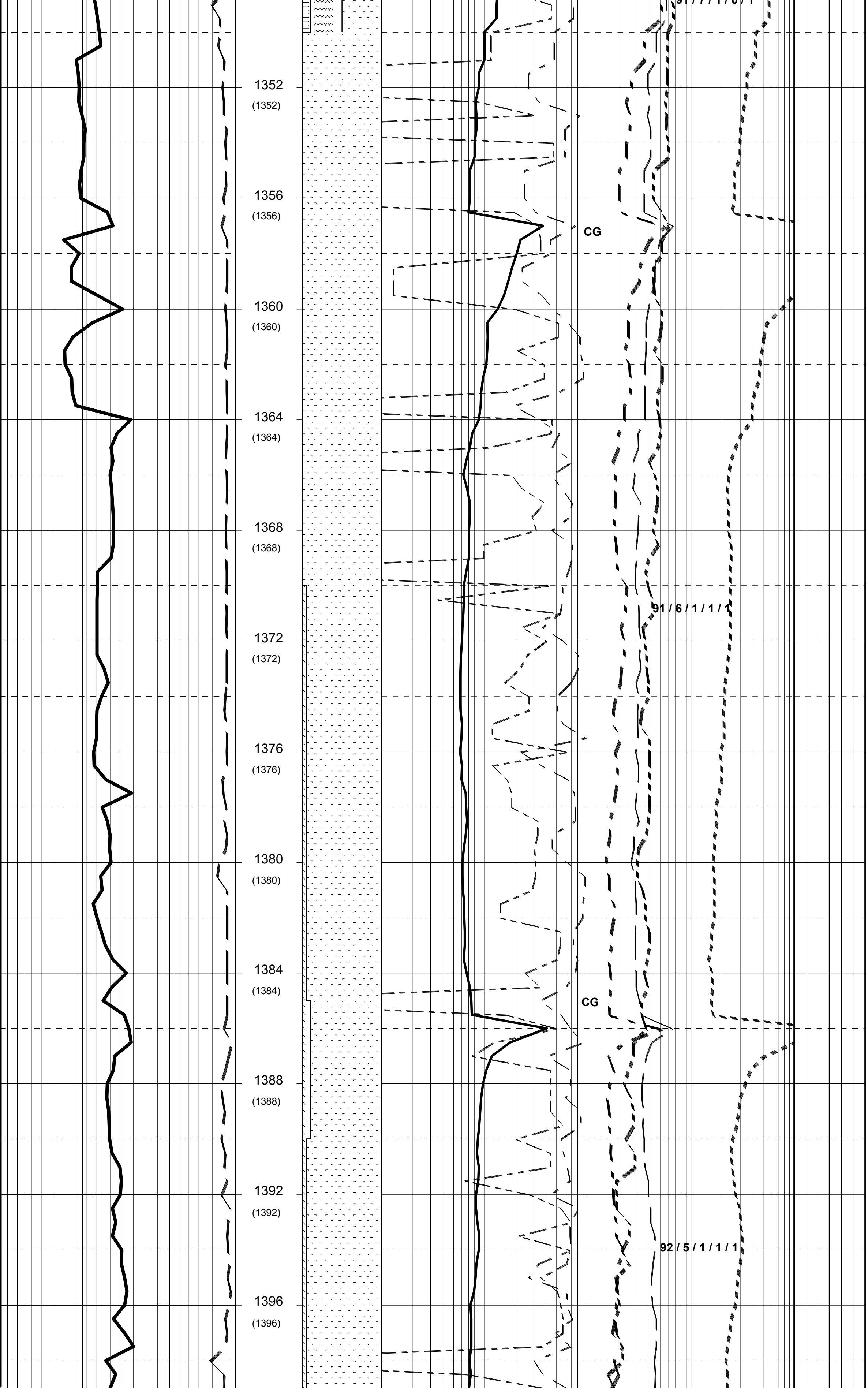
SILTSTONE:dk rd/bn,arg,abd carb lam, frm,blky.

(1)SILTSTONE:pl-m brn,arg,com carb, lith & glauc frag,frm-mod hd,sbblky.

(2)SILTSTONE:v pa gn-gy,arg,v calc, mod hd,sbblky.

SANDSTONE:trnsl,f-v crs,pred med, pr srt,ang-sr,abd qtz,fri-mod hd, tr pyr,gd inf por,no flour.

(1)SILTSTONE:pl-m brn,arg,com carb, lith & glauc frag,frm-mod hd,sbblky.



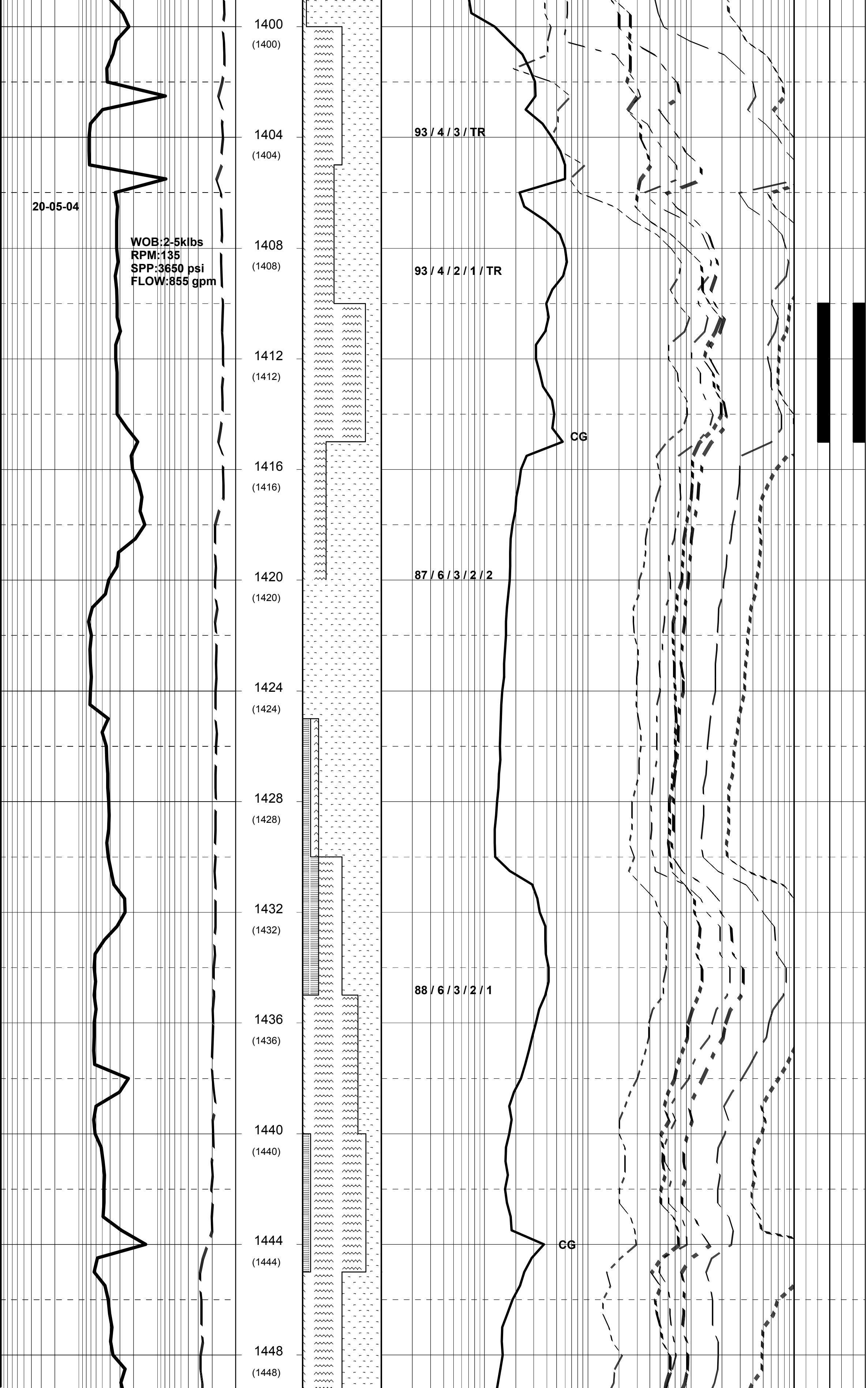
COAL:blk,dul,brt,blky,grd to carb sltst.

SANDSTONE:clr-trnsl,fn-v crs,pred med,pr srt,wk sil cmt,com crs qtz grn,cln,fri,gd-exl inf por,no flour.

5m SAMPLES FROM 1380m

SANDSTONE:trnsl,f-v crs,pred med grn,pr srt,ang-sr,abdt qtz,fri-mod hd,gd inf por,tr pyr,no flour.

SANDSTONE:clr-off wh,fn-crs,pred med-crs grn,mod srt,sub ang (crs)-sub rnd (fn),wk sil cmt,com qtz spks (crs),cln,fri,gd inf por, no flour.



(1)SILTSTONE:v dk-dk gy-med gy bn-med bn,v carb,occ cl inc,mic mic, sl calc,frm-fri,blky-sbblky.

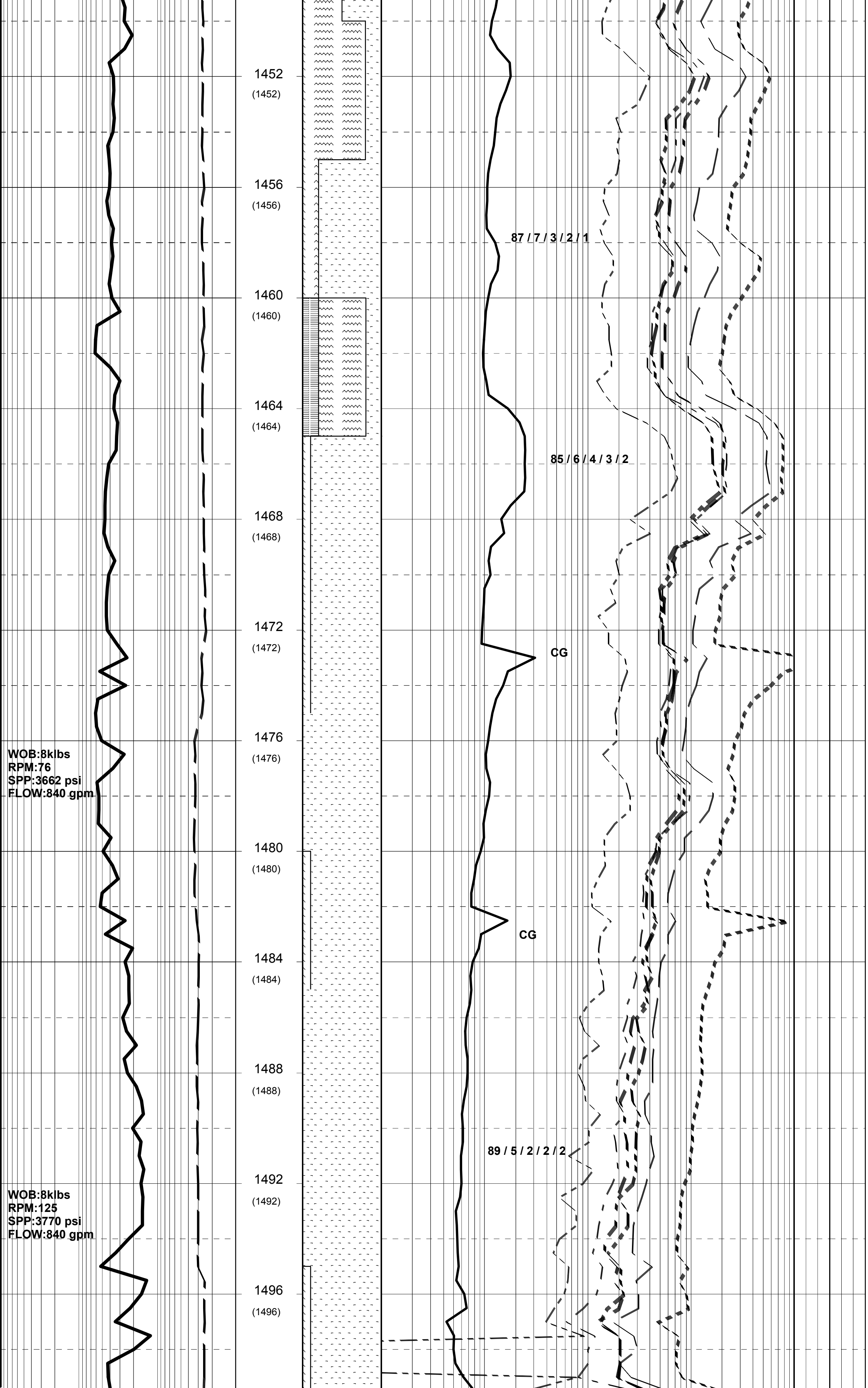
(2)SILTSTONE:pl gy gn,arg,rr carb spks,mod calc,frm-sft,sblky-blky.

SANDSTONE:clr-trnsl,f-v crs,pred crs-v crs,pr srt,ang-sr,occ ang frac grns, cln,tr wh arg mtx,gd inf por, FLUOR:tr dull yel pnpt,no dir cut,tr v slw crsh cut,tr wh res ring.

SILTSTONE:v dk-dk gy-red bn-med bn,v carb,occ cl inc,mic mic,com glauc,sl calc,frm-fri,blky-sbblky.

SANDSTONE:clr-trnsl,med-v crs com crs-v crs,sa-sr,p srt,lse,tr sil cmt,tr wh arg mtx,gd inf por,no fluor.

SILTSTONE:bn gy-bnsh blk,frm britt i/p,v carb,com carb lam,micmic,com glauc,sl calc,frm-fri,blky-fiss.



(1)SILTSTONE:(dom)lt bnsh gy occ lt b
v sft,dip i/p,occ carb lam/spks,
v sft,amor.

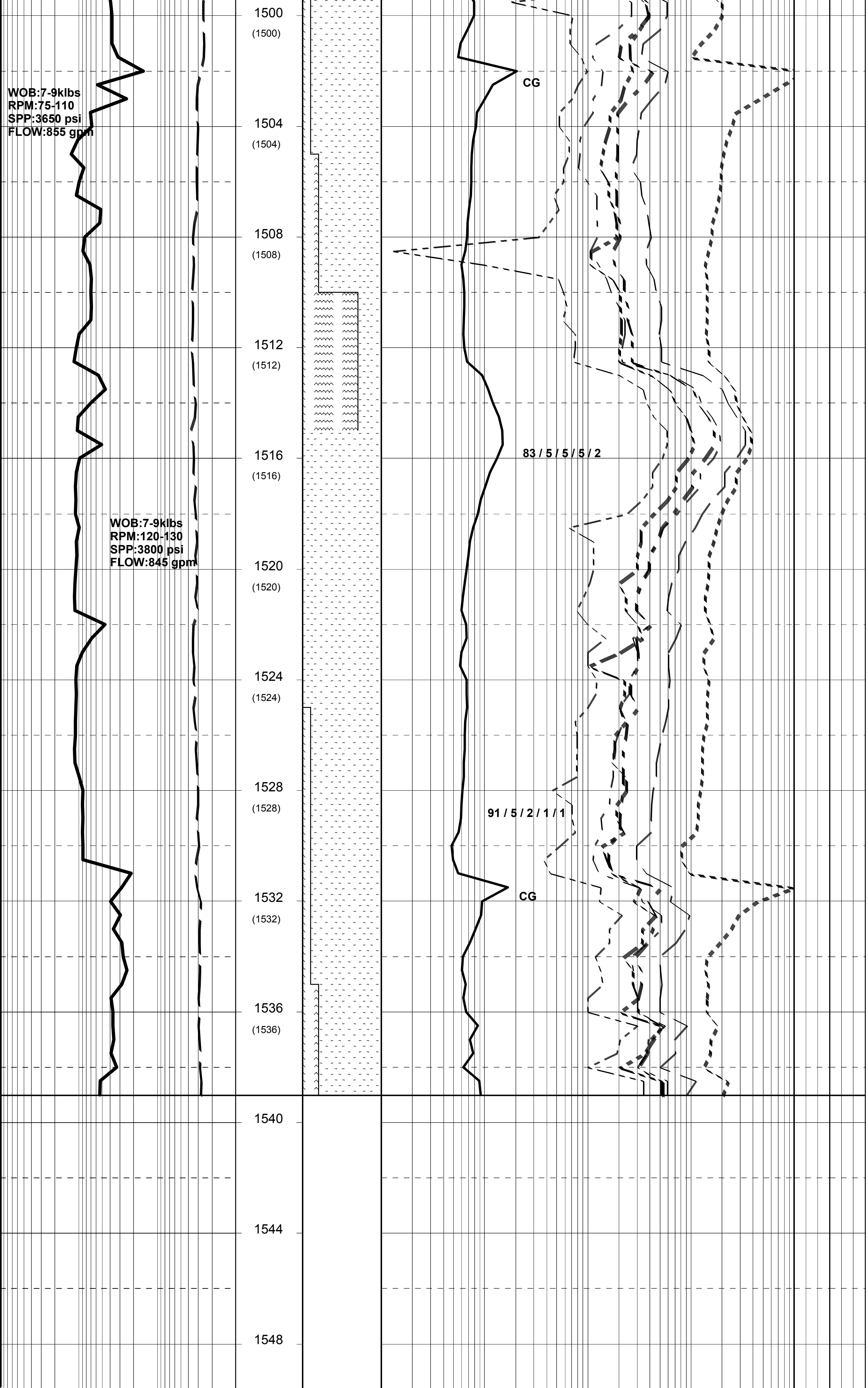
(2)SILTSTONE:gnsh gy,arg,frm,calc,
occ glauc,sbblky-blky.

SANDSTONE:clr-trnsl-mlky wh,med-
v crs com crs-v crs,sa-sr,p srt,
wk sil cmt,lse,tr strng pyr cmt,tr
wh arg mtx,gd inf por,no fluor.

COAL:blk,dull,britt,uneven frac,rr
sbconch,slty i/p,g/t inter lam w/
carb sltst.

SILTSTONE:bnsh gy-bnsh blk occ
redsh bn,v carb,g/t carb sltst,
frm,blky-britt.

SANDSTONE:clr-trnsl,vf-vc,v pr srt,sa-
sr,wk sil cmt,lse,cln w/tr wh arg mtx,
gd inf por,no fluor.



(1)SILTSTONE:med-dk bn occ lt-med gy,com carb spks,glauc,sft-frm, sbblky-sbfiss.

(2)SILTSTONE:minor comp,gnsh gy, calc,sft-frm,sbblky-amor.

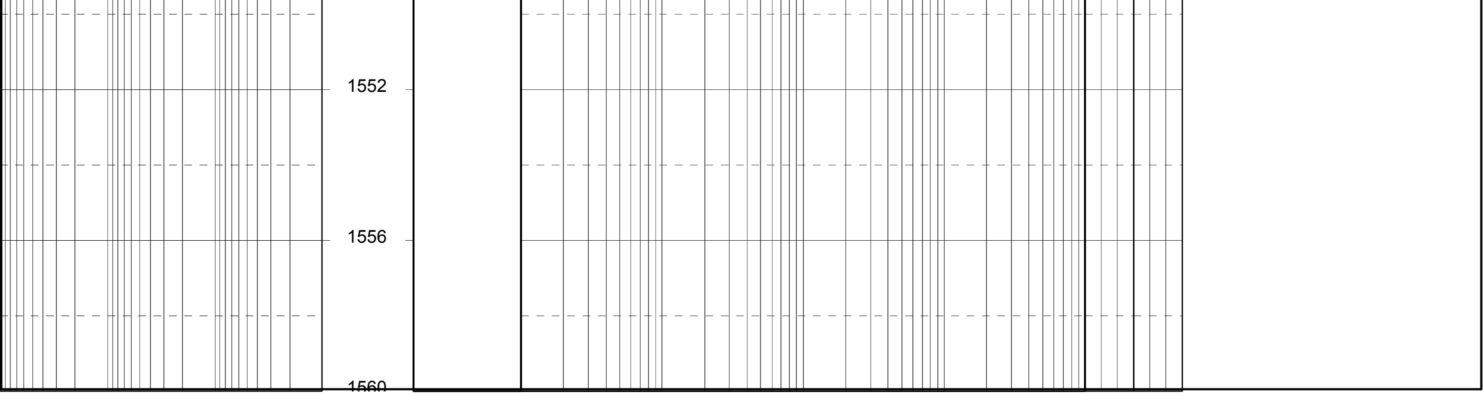
SANDSTONE:clr-trnsl,med-vc,mod srt, sr,lse,cln w/tr wh arg mtx,tr pyr cmt, gd inf por,no fluor.

SILTSTONE:med-dk bn occ lt-med gy,com carb spks,glauc,sft-frm, g/t carb sltst,sbblky-sbfiss.

SANDSTONE:clr-trnsl,med-vc,mod srt, sa-sr,lse,abdt wh arg mtx,gd inf por, no fluor.

WEST WHIPTAIL-1
REACHED TD @ 1539.0mMDRT
@ 09:00 HRS ON 20-05-2004

E-LOG RUNS
(1) PEX-HALS-HNGS-DSI
(2) MDT-GR (aborted)
(2A) MDT-GR
(3) CSAT-GR


1552
1556
1560

ENCLOSURE 3

DRILLING LOG

DRILLING LOG

FROM :(mt) 100 | TO :(mt) 1560 | SCALE : 1/ 1000

Well Name : WEST WHIPTAIL-1

Company : ESSO AUSTRALIA

Country : Australia

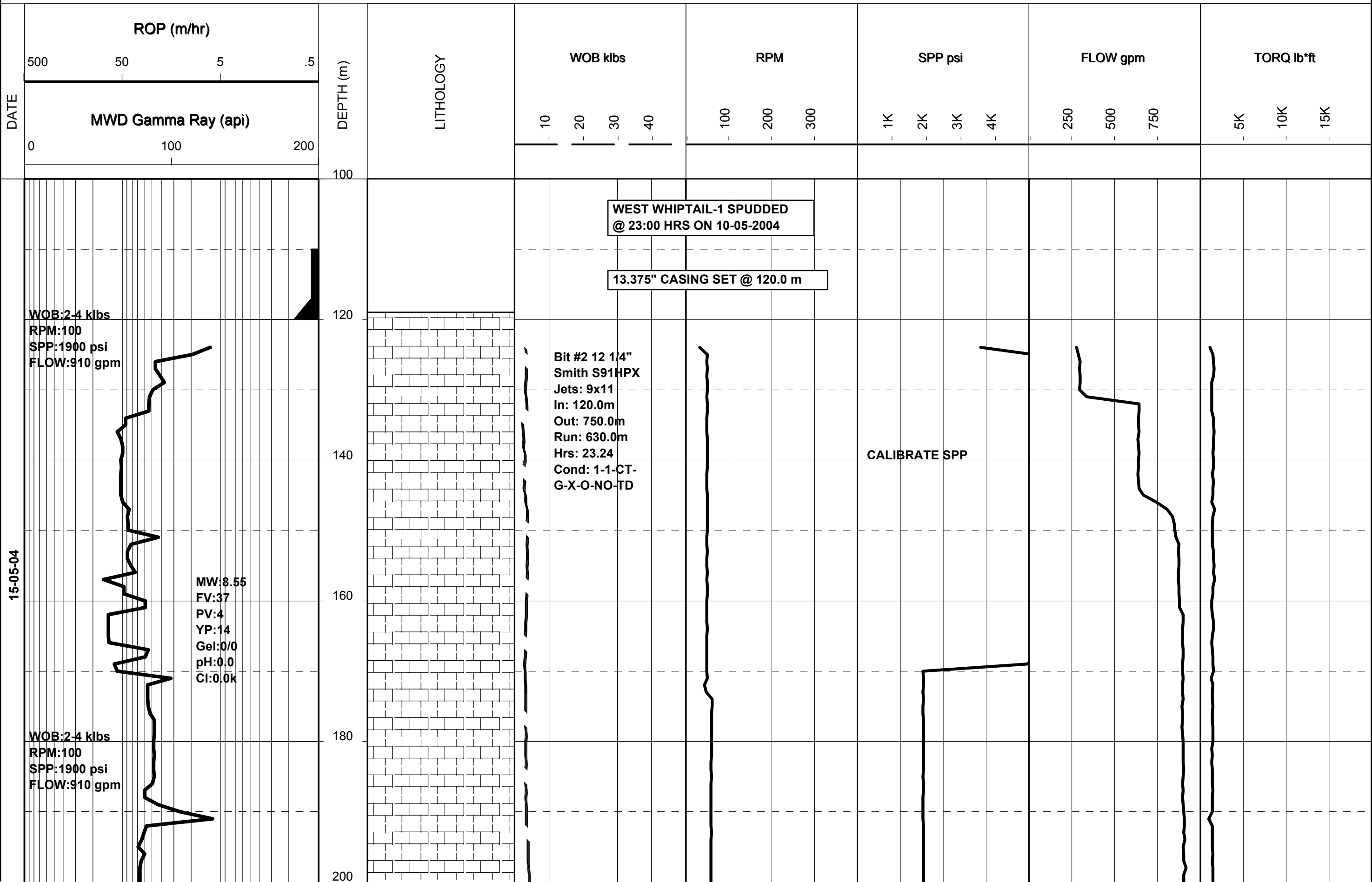
RT-MSL : 39.0m

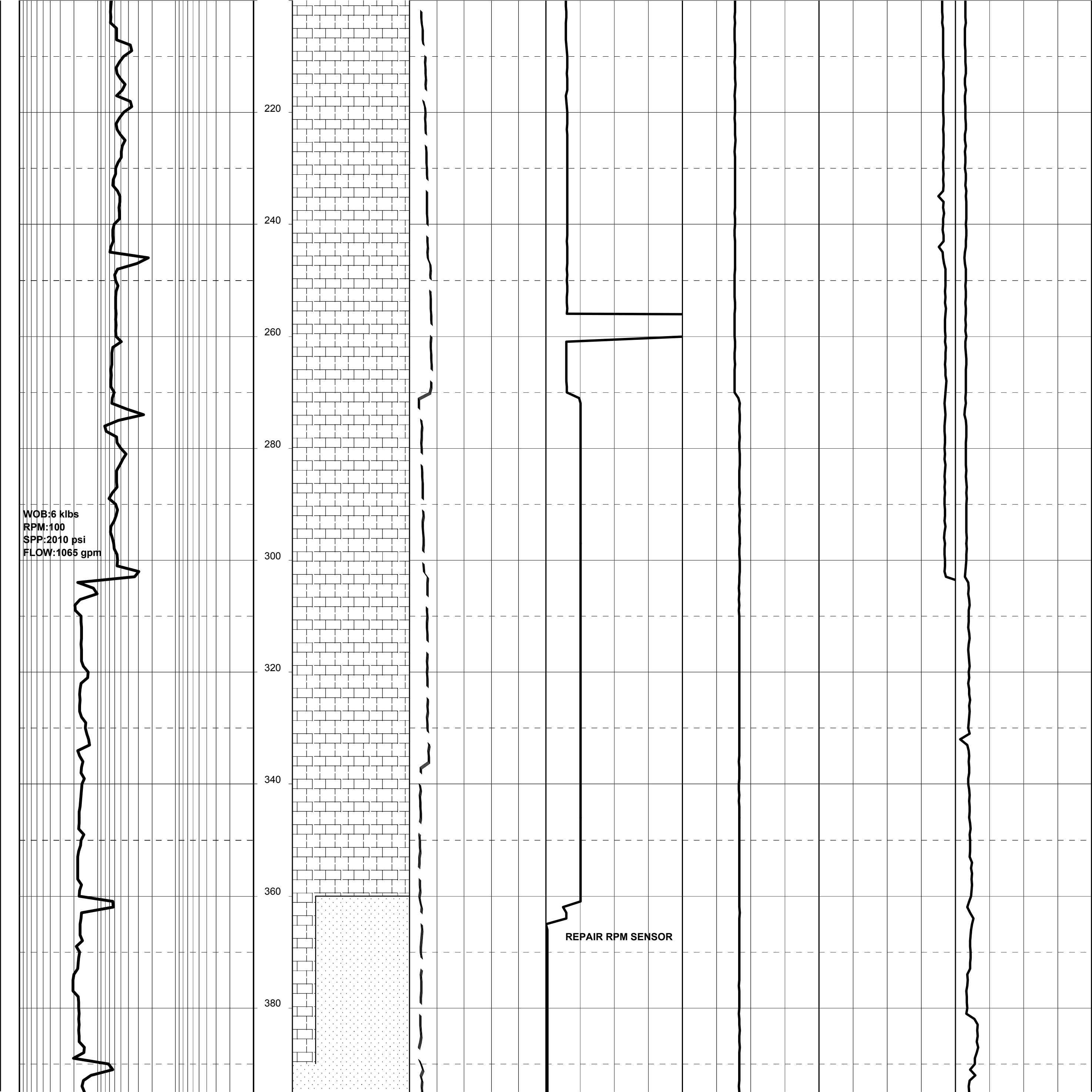
RT-SEABED : 78.0m

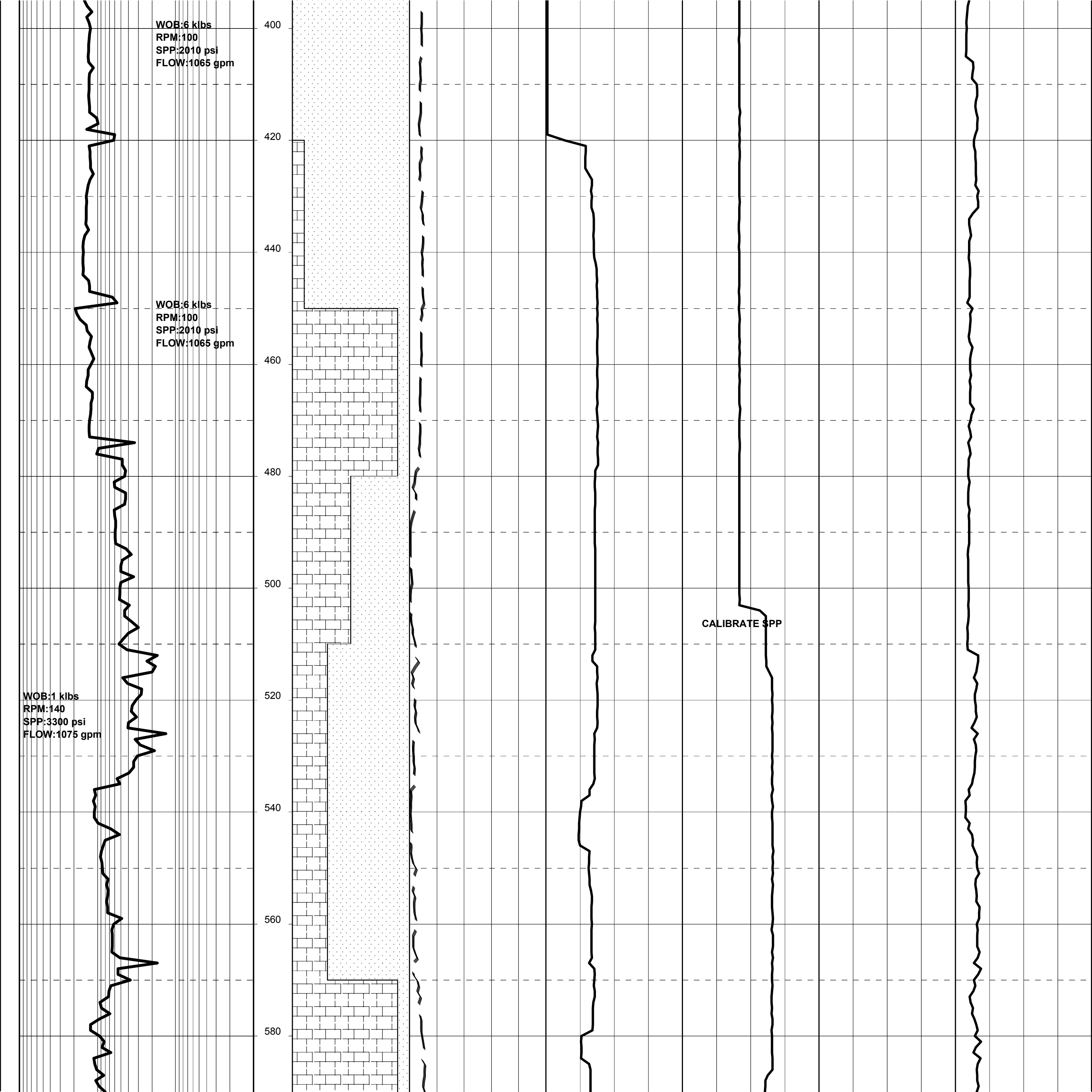
Final TD : 1539 mRT

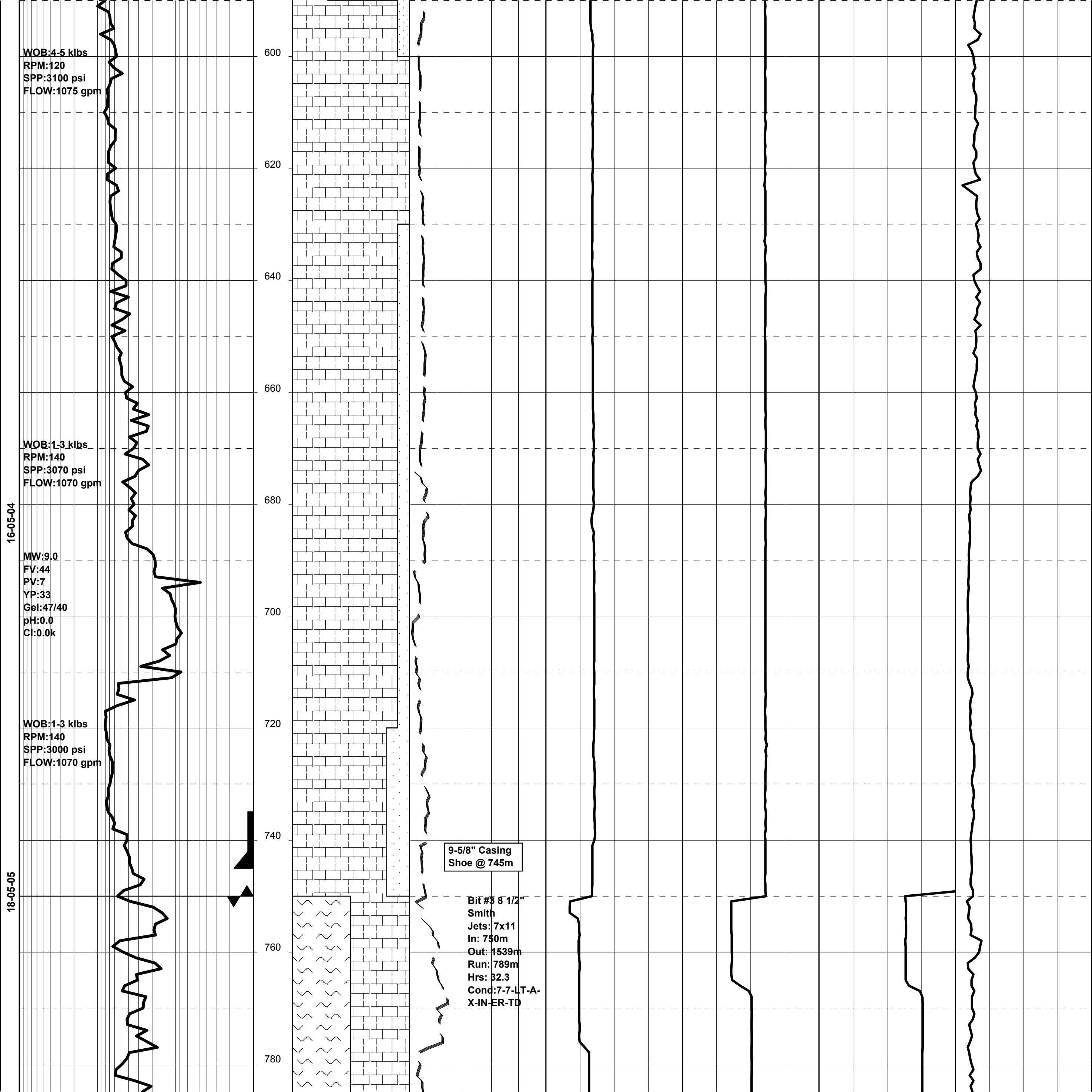
Final TVD : 1539 mRT

Generated by ALS Package



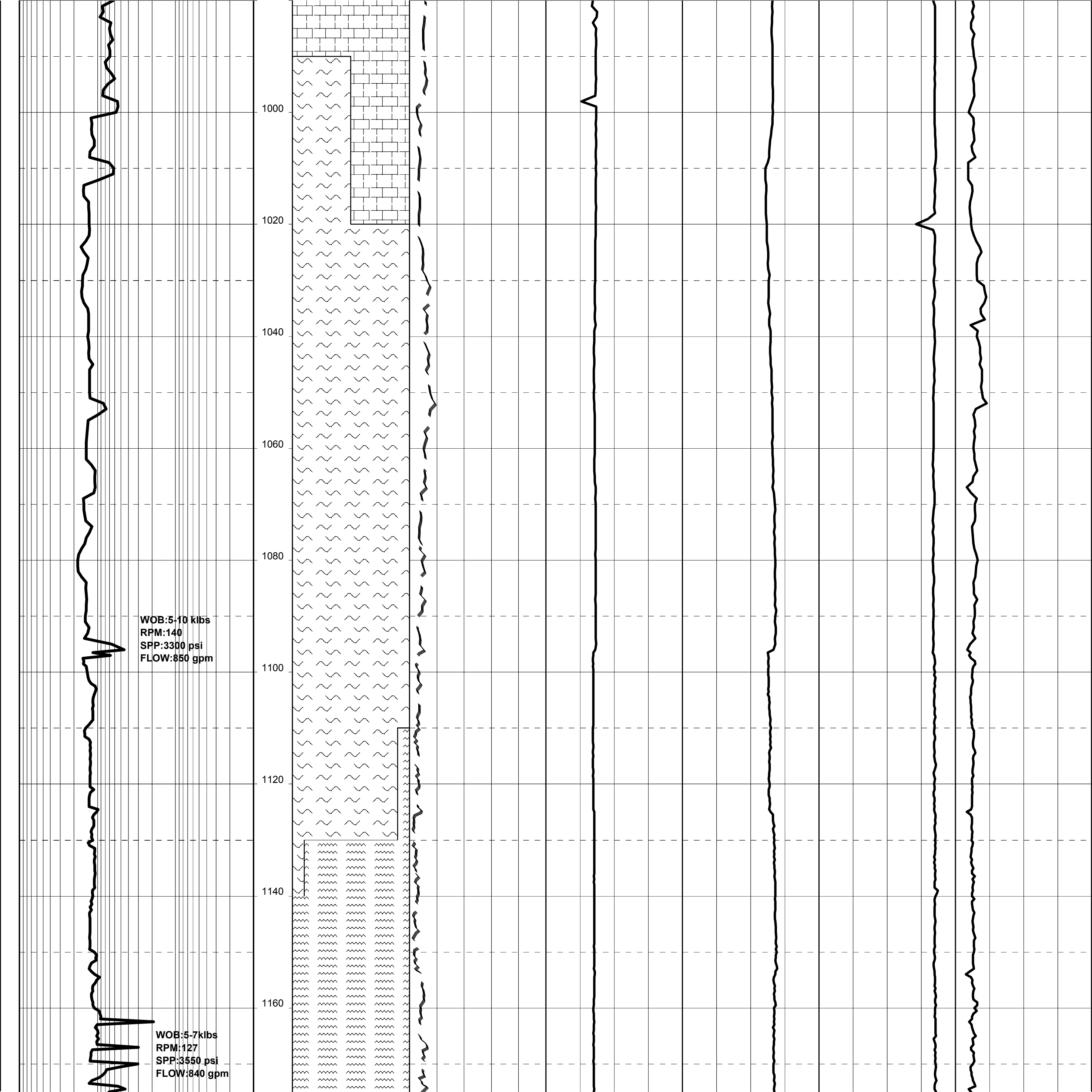

220
240
260
280
WOB:6 klbs
RPM:100
SPP:2010 psi
FLOW:1065 gpm
300
320
340
360
REPAIR RPM SENSOR
380

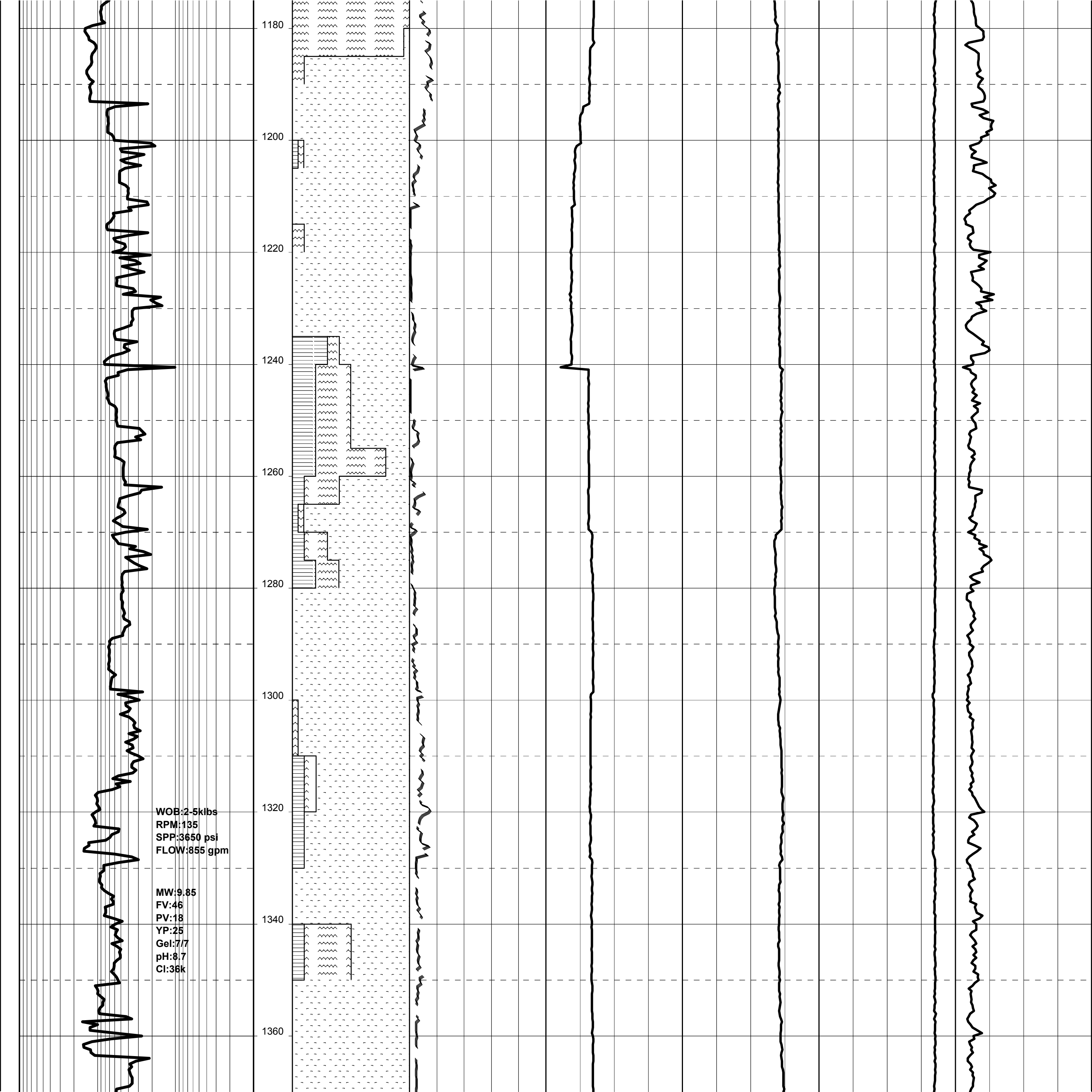

WOB:6 klbs
RPM:100
SPP:2010 psi
FLOW:1065 gpm
400
420
440
WOB:6 klbs
RPM:100
SPP:2010 psi
FLOW:1065 gpm
460
480
500
CALIBRATE SPP
WOB:1 klbs
RPM:140
SPP:3300 psi
FLOW:1075 gpm
520
540
560
580

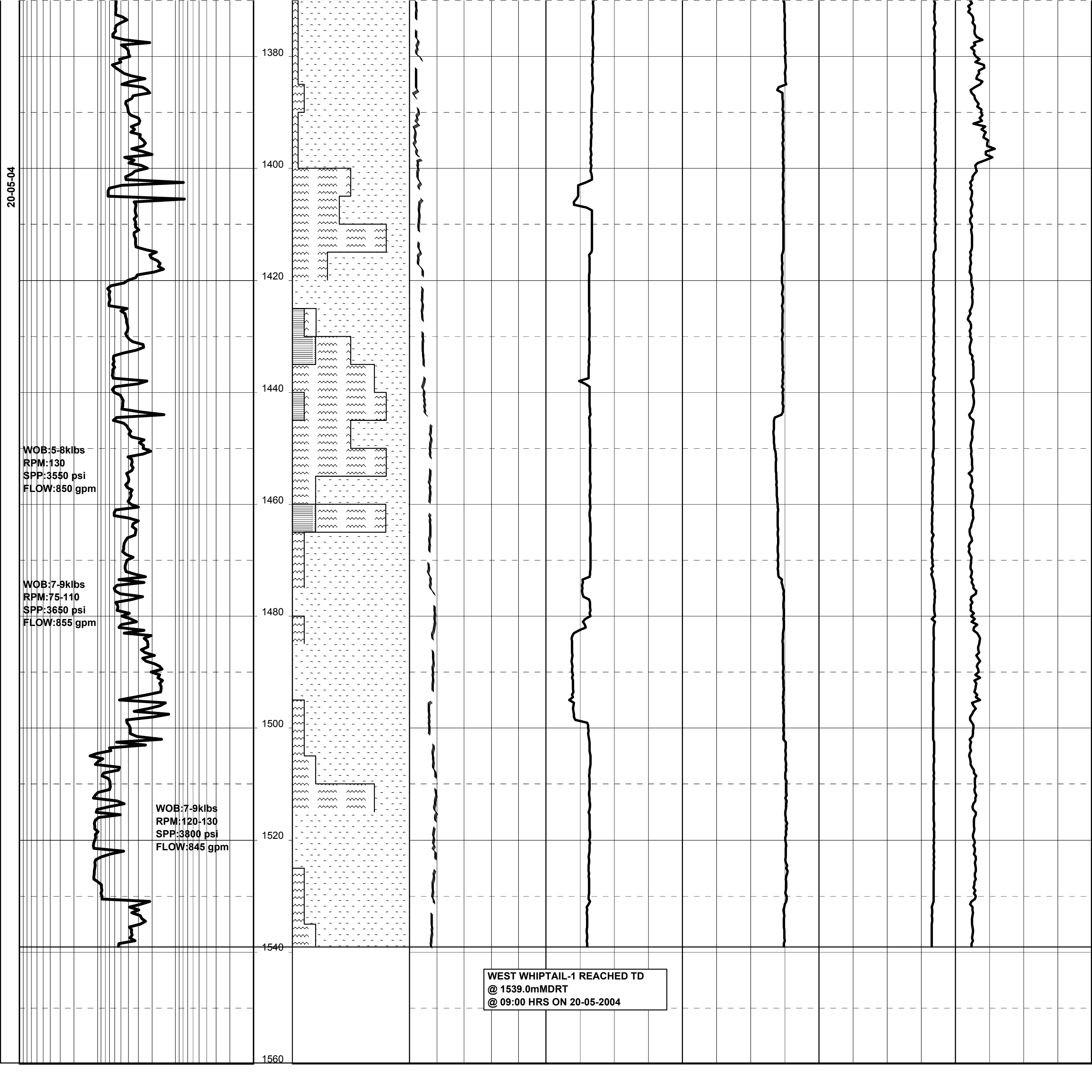


WOB:4-5 klbs
RPM:120
SPP:3100 psi
FLOW:1075 gpm
WOB:1-3 klbs
RPM:140
SPP:3070 psi
FLOW:1070 gpm
16-05-04
MW:9.0
FV:44
PV:7
YP:33
Gel:47/40
pH:0.0
Cl:0.0k
WOB:1-3 klbs
RPM:140
SPP:3000 psi
FLOW:1070 gpm
18-05-05
600
620
640
660
680
700
720
740
760
780
9-5/8" Casing
Shoe @ 745m
Bit #3 8 1/2"
Smith
Jets: 7x11
In: 750m
Out: 1539m
Run: 789m
Hrs: 32.3
Cond:7-7-LT-A-
X-IN-ER-TD


19-05-04
WOB:4-6 klbs
RPM:140
SPP:2350 psi
FLOW:745 gpm
MW:9.80
FV:44
PV:12
YP:19
Gel:6/7
pH:8.5
Cl:37k
WOB:4-6 klbs
RPM:140
SPP:2740 psi
FLOW:825 gpm
WOB:5-6 klbs
RPM:140
SPP:3270 psi
FLOW:850 gpm
800
820
840
860
880
900
920
940
960
980

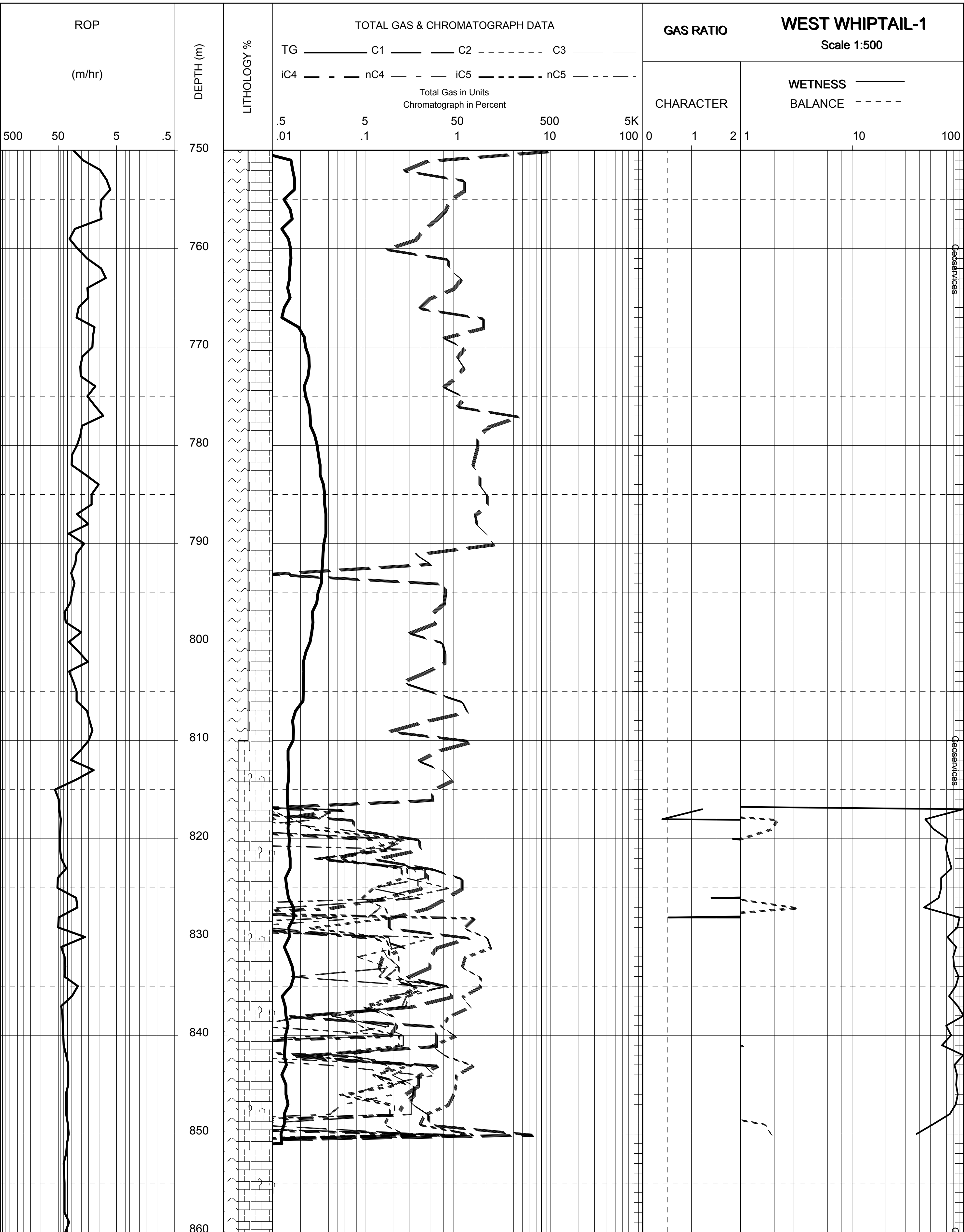

1000
1020
1040
1060
1080
WOB:5-10 klbs
RPM:140
SPP:3300 psi
FLOW:850 gpm
1100
1120
1140
1160
WOB:5-7klbs
RPM:127
SPP:3550 psi
FLOW:840 gpm


1180
1200
1220
1240
1260
1280
1300
1320
1340
1360
WOB:2-5klbs
RPM:135
SPP:3650 psi
FLOW:855 gpm
MW:9.85
FV:46
PV:18
YP:25
Gel:7/7
pH:8.7
Cl:36k

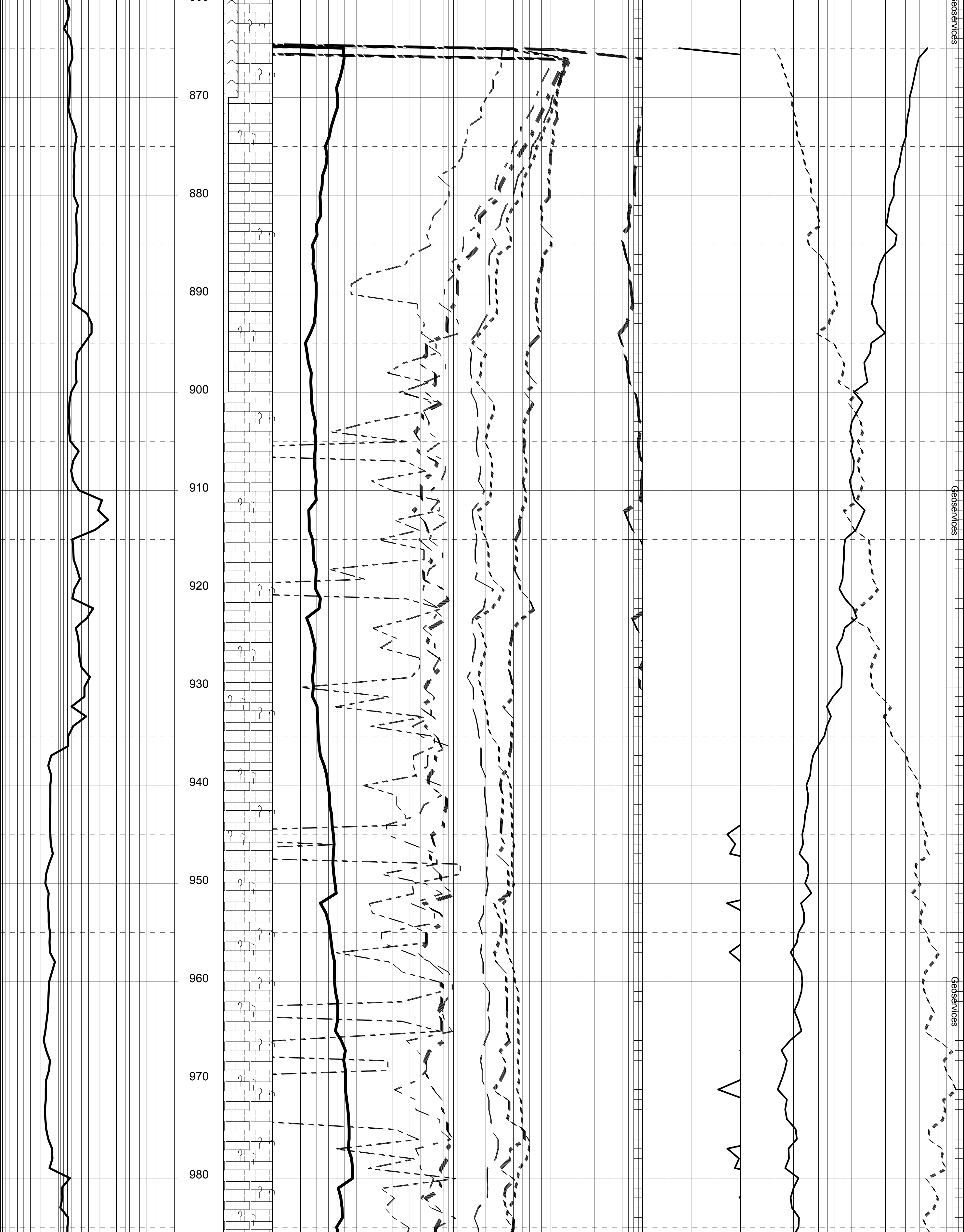

20-05-04
1380
1400
1420
1440
1460
1480
1500
1520
1540
1560
WOB:5-8klbs
RPM:130
SPP:3550 psi
FLOW:850 gpm
WOB:7-9klbs
RPM:75-110
SPP:3650 psi
FLOW:855 gpm
WOB:7-9klbs
RPM:120-130
SPP:3800 psi
FLOW:845 gpm
WEST WHIPTAIL-1 REACHED TD
@ 1539.0mMDRT
@ 09:00 HRS ON 20-05-2004

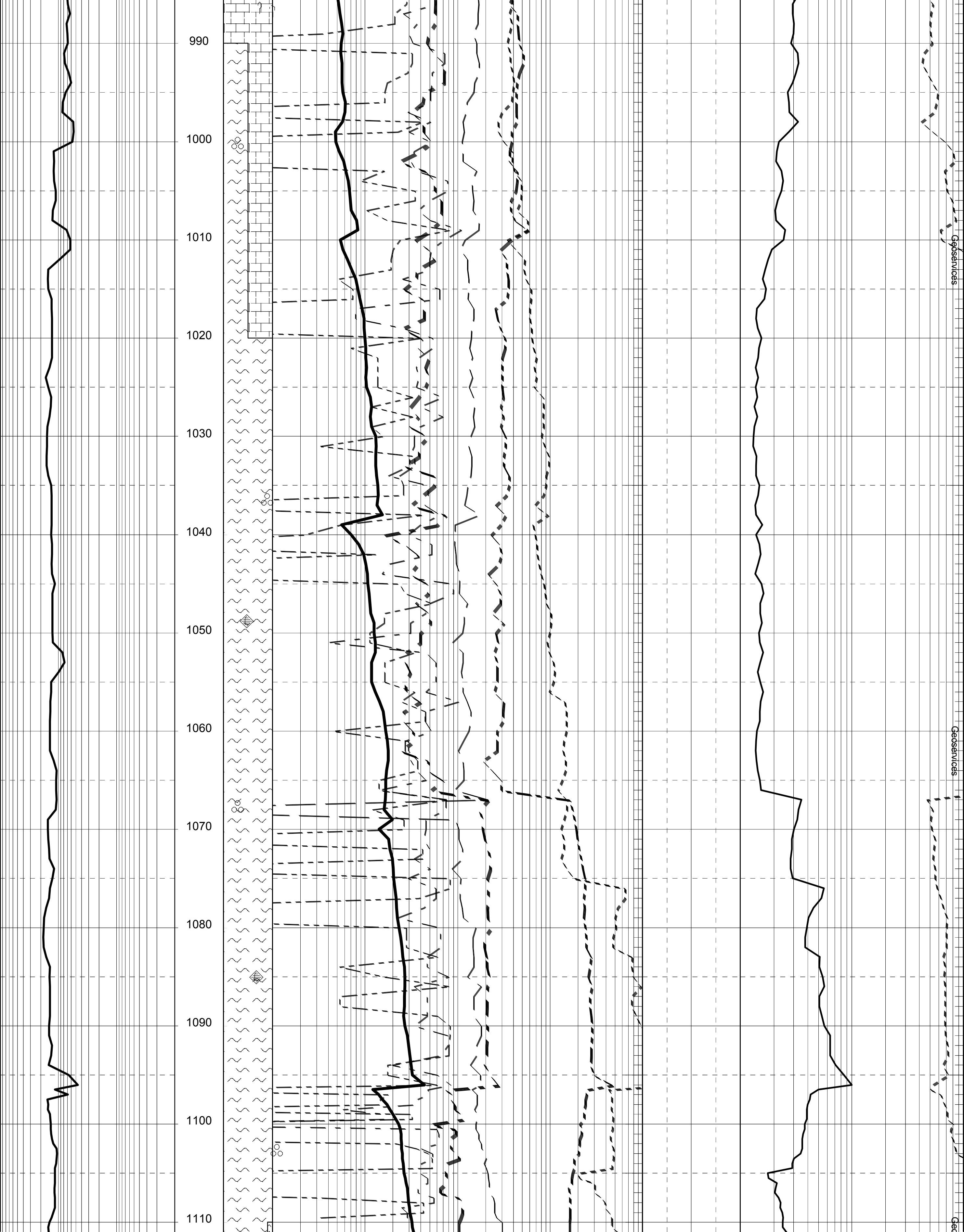
ENCLOSURE 4

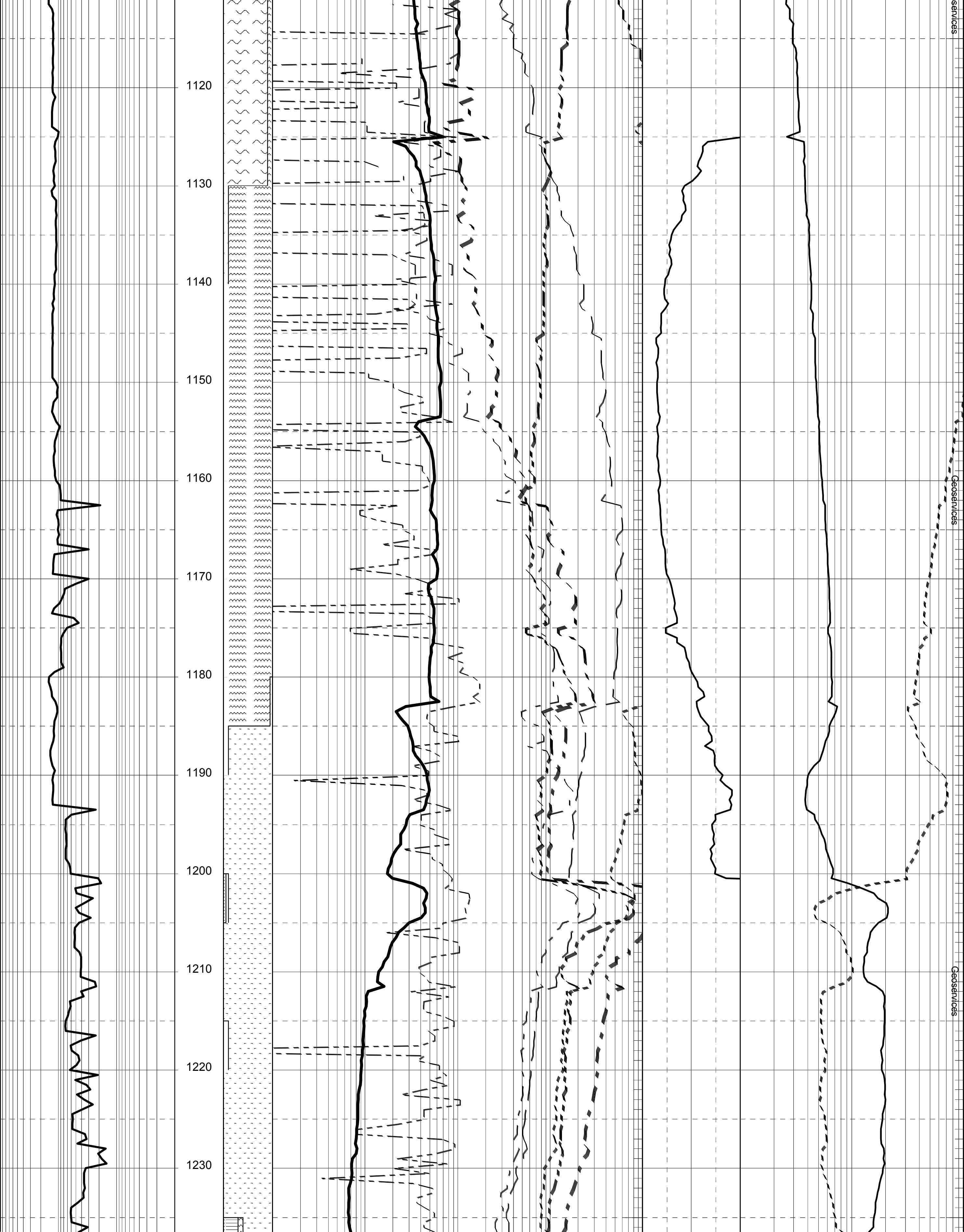
GAS RATIO LOG

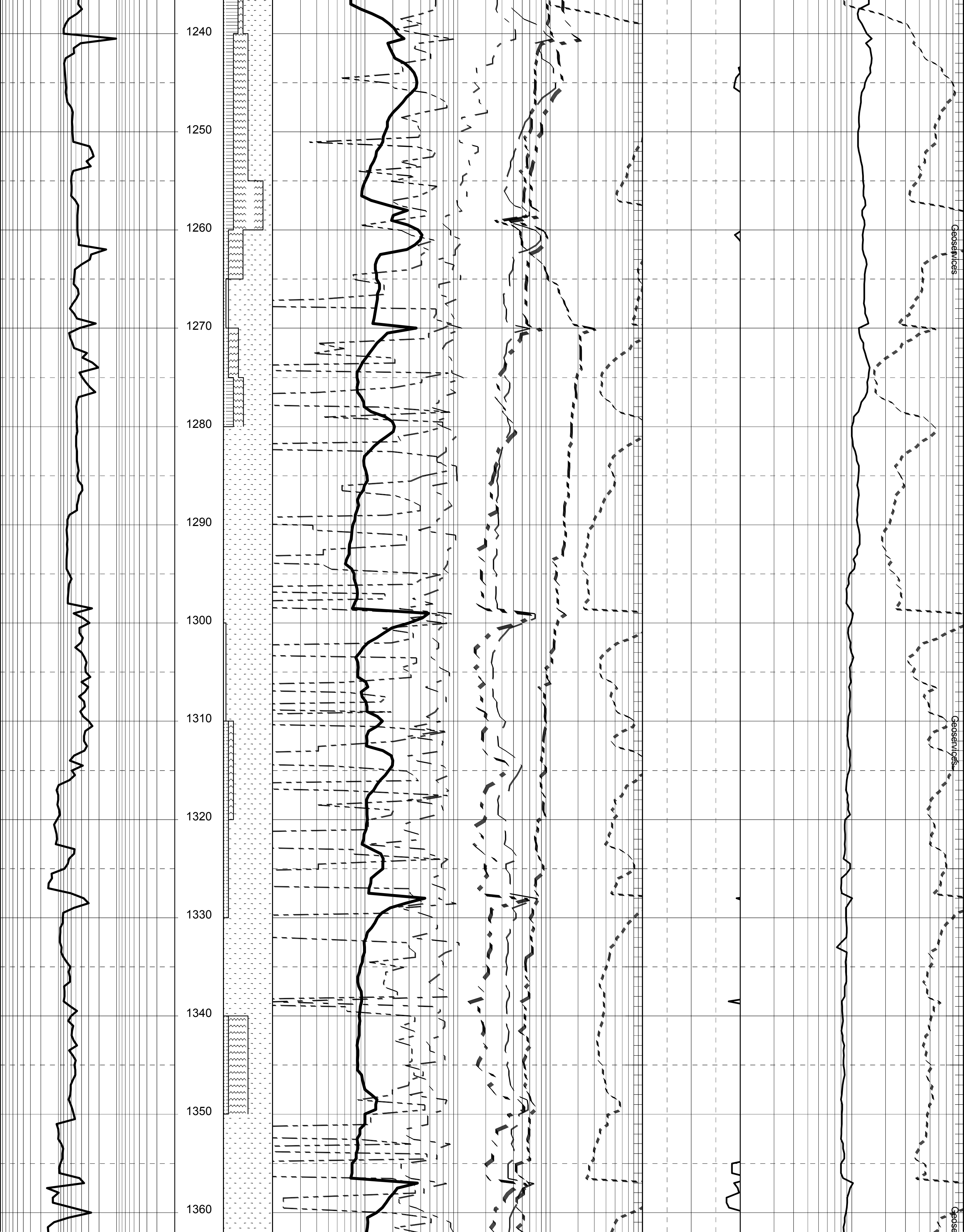


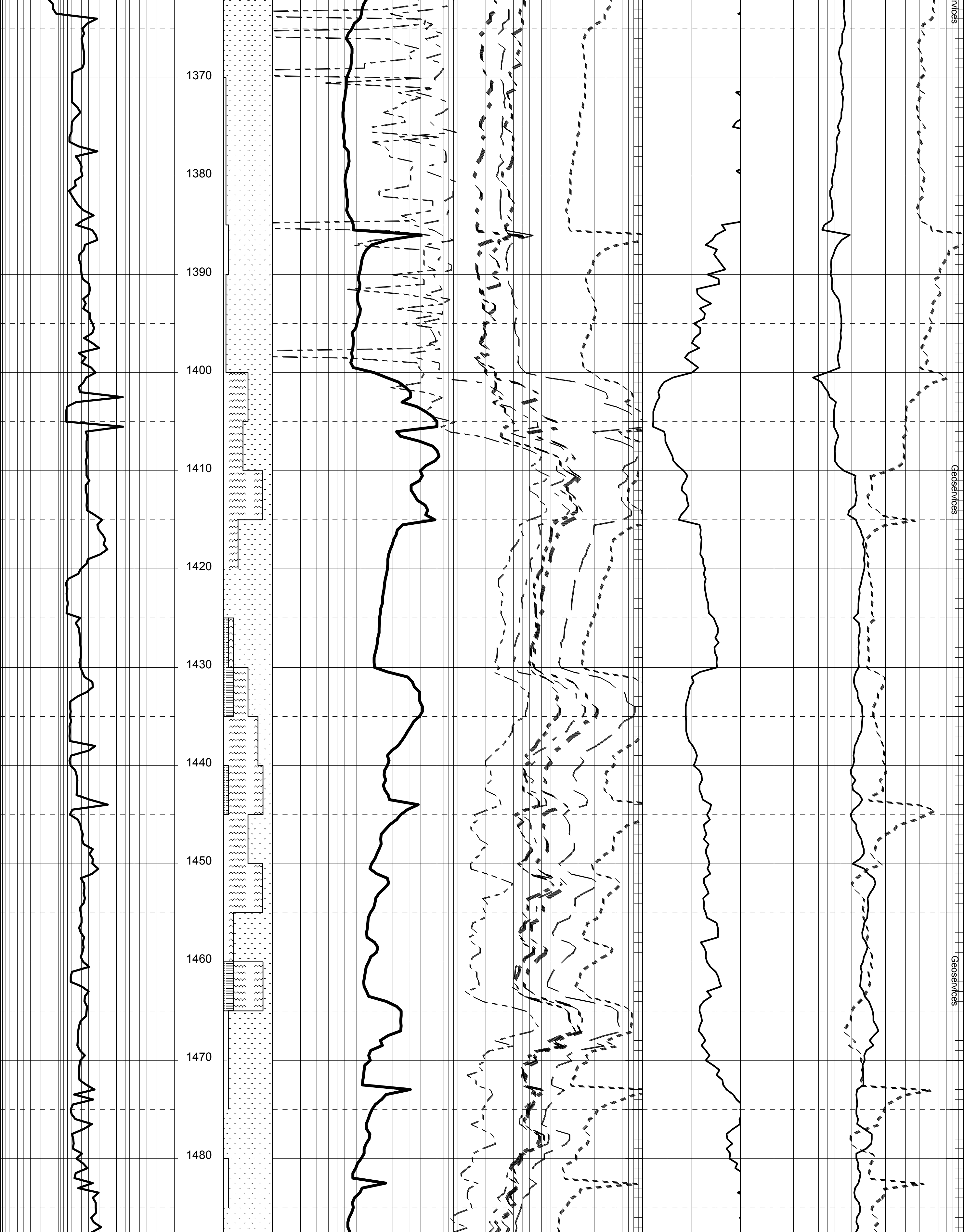
WEST WHIPTAIL-1
Scale 1:500
ROP
(m/hr)
500 50 5 .5
DEPTH (m)
LITHOLOGY %
TOTAL GAS & CHROMATOGRAPH DATA
TG C1 C2 C3
iC4 nC4 iC5 nC5
Total Gas in Units
Chromatograph in Percent
.5 5 50 500 5K
.01 .1 1 10 100
GAS RATIO
CHARACTER
0 1 2
WETNESS
BALANCE
1 10 100
750
760
770
780
790
800
810
820
830
840
850
860
Geoservices
Geoservices

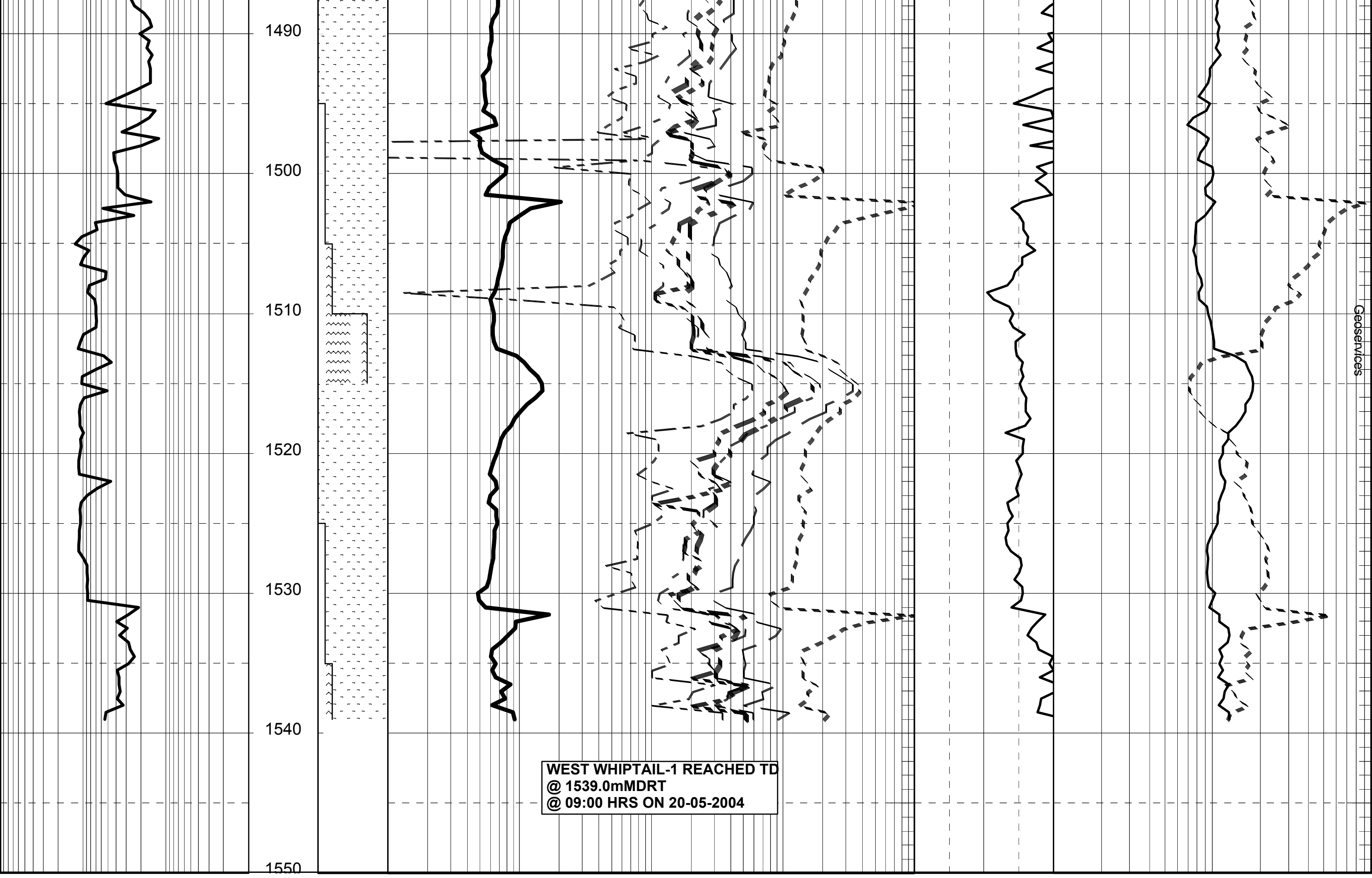

870
880
890
900
910
920
930
940
950
960
970
980
Geoservices
Geoservices


990
1000
1010
1020
1030
1040
1050
1060
1070
1080
1090
1100
1110
Geoservices
Geoservices


1120
1130
1140
1150
1160
1170
1180
1190
1200
1210
1220
1230
Geoservices
Geoservices

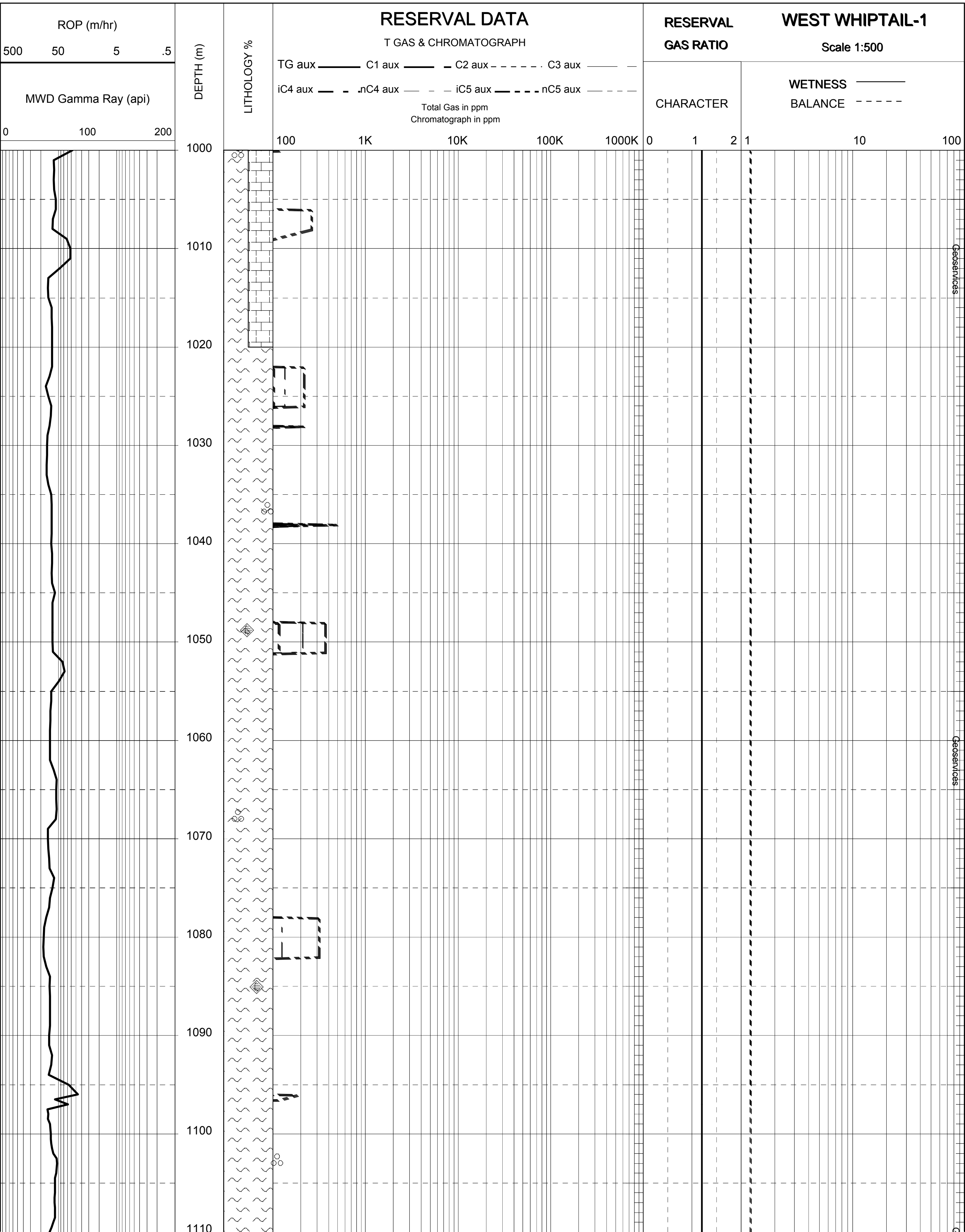

1240
1250
1260
1270
1280
1290
1300
1310
1320
1330
1340
1350
1360
Geoservices
Geoservices


1370
1380
1390
1400
1410
1420
1430
1440
1450
1460
1470
1480
Geoservices
Geoservices

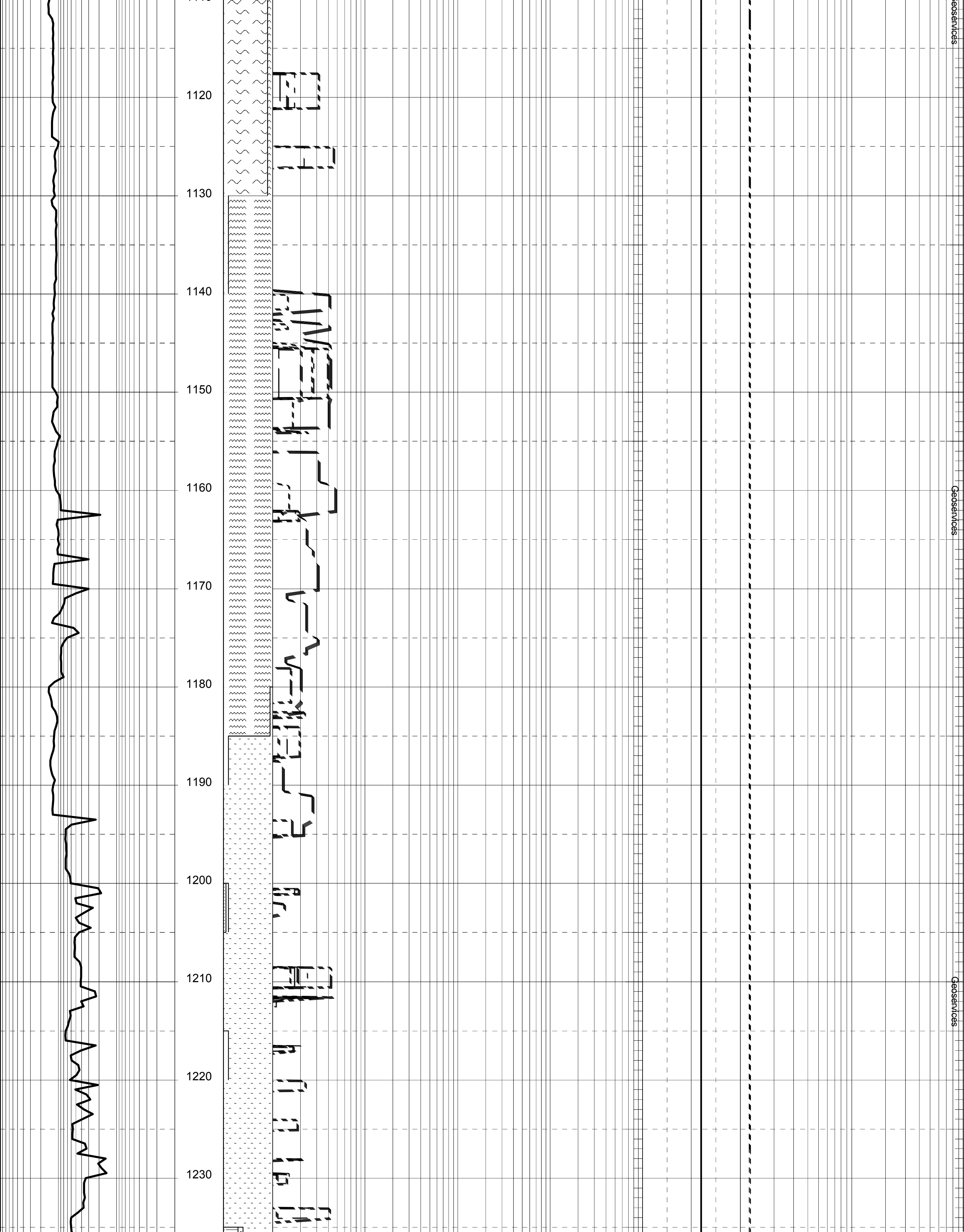

1490
1500
1510
1520
1530
1540
1550
WEST WHIPTAIL-1 REACHED TD
@ 1539.0mMDRT
@ 09:00 HRS ON 20-05-2004
Geoservices

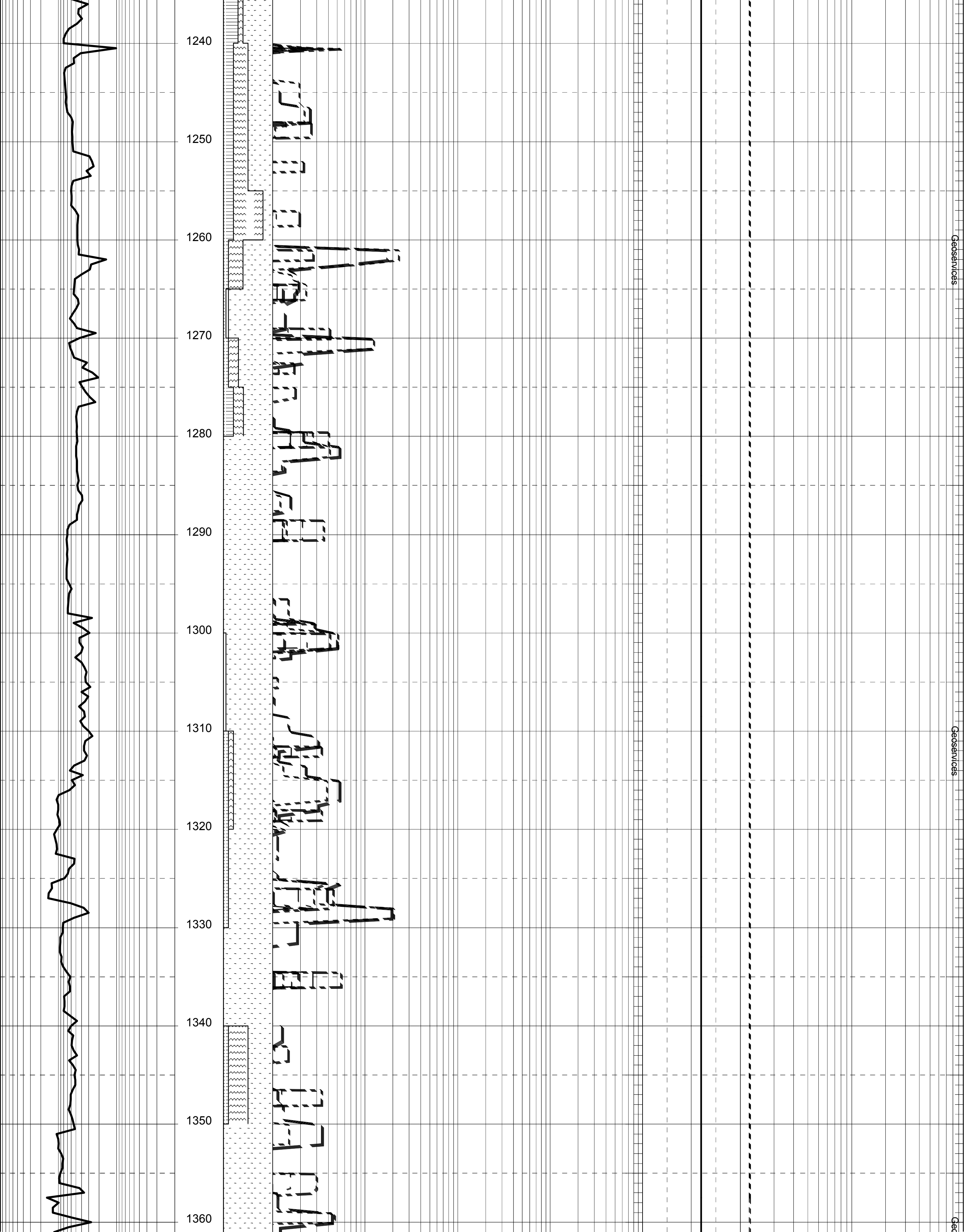
ENCLOSURE 5

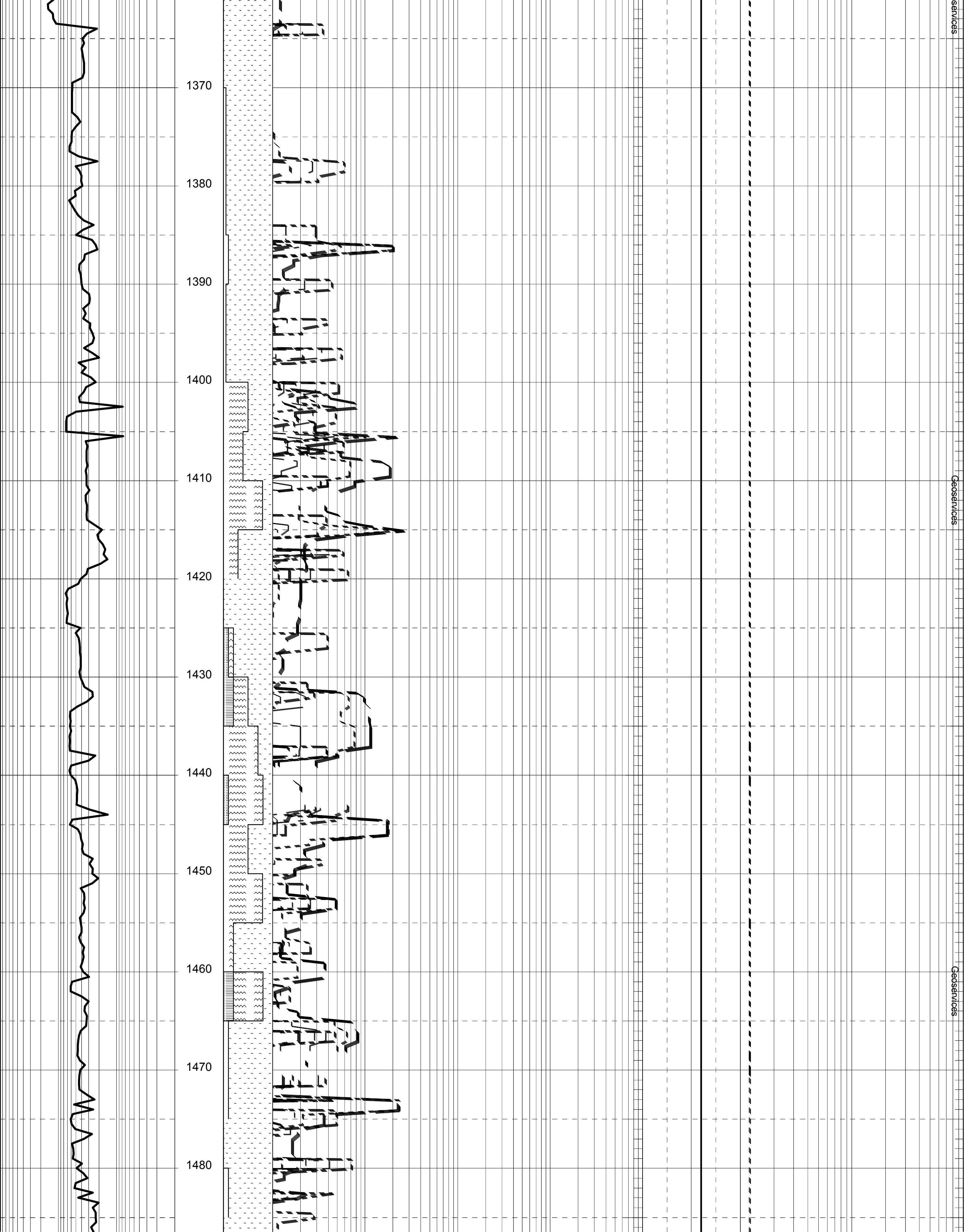
RESERVAL GAS RATIO LOG

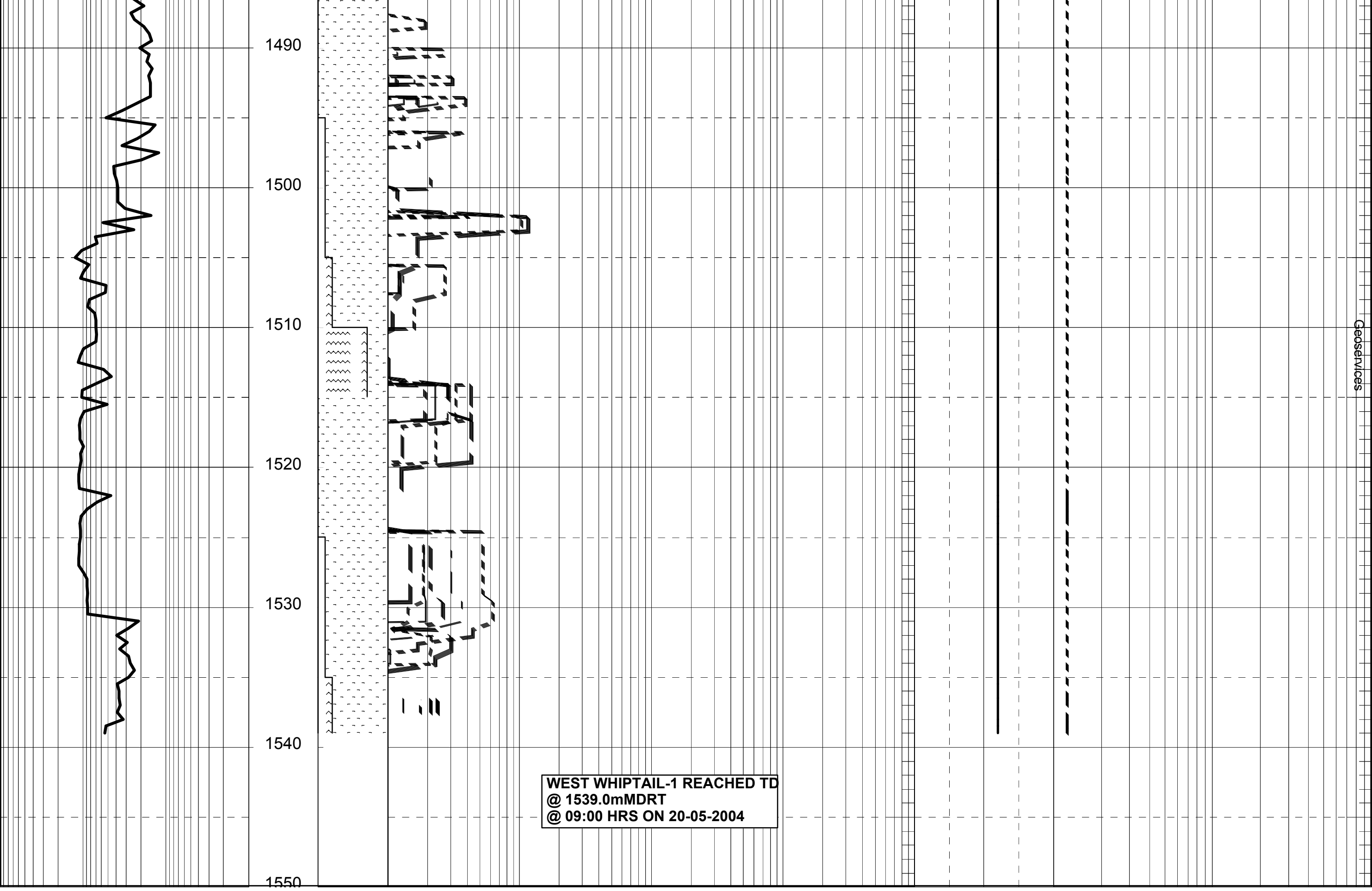


ROP (m/hr)
500 50 5 .5
MWD Gamma Ray (api)
0 100 200
DEPTH (m)
LITHOLOGY %
RESERVAL DATA
T GAS & CHROMATOGRAPH
TG aux C1 aux C2 aux C3 aux
iC4 aux nC4 aux iC5 aux nC5 aux
Total Gas in ppm
Chromatograph in ppm
100 1K 10K 100K 1000K
RESERVAL
GAS RATIO
CHARACTER
0 1 2
WEST WHIPTAIL-1
Scale 1:500
WETNESS
BALANCE
1 10 100
1000
1010
1020
1030
1040
1050
1060
1070
1080
1090
1100
1110
Geoservices
Geoservices


1120
1130
1140
1150
1160
1170
1180
1190
1200
1210
1220
1230
Geoservices
Geoservices
Geoservices


1240
1250
1260
1270
1280
1290
1300
1310
1320
1330
1340
1350
1360
Geoservices
Geoservices


1370
1380
1390
1400
1410
1420
1430
1440
1450
1460
1470
1480
Geoservices
Geoservices


1490
1500
1510
1520
1530
1540
1550
WEST WHIPTAIL-1 REACHED TD
@ 1539.0mMDRT
@ 09:00 HRS ON 20-05-2004
Geoservices