

URS Corporation Texas City, Texas

Malone Services Corporation Injection Well WDW-138

2006 Mechanical Integrity Test & Bottomhole Pressure Survey Report

> March 29, 2006 Sandia Project No. 839-URS-06



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NOTE: The interpretations and opinions present in this report use sound engineering practices and analysis, but are based on a review of the data and information provided to Sandia Technologies, LLC (Sandia). Sandia makes no warranty, express or implied, as to the source or accuracy of the data or of any calculations, interpretations, or opinions expressed herein. The client agrees that Sandia, its officers, agents and employees, or subcontractors, shall not be held responsible or liable for any loss or damage, arising out of its recommendations, or in connection with such interpretation of data, calculations, or opinions in this report.

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EXECUTIVE SUMMARY

Annual mechanical integrity and ambient pressure testing was recently conducted on WDW-138, a Class I Hazardous Waste Injection Well at the Malone Service Company, Inc. (MSC) Superfund Site in Texas City, Texas. URS Corporation (URS), the agent for the Malone Cooperating Parties, managed the testing program. The fieldwork was performed on March 13, 2006 and consisted of a static bottomhole pressure survey, an Annulus Pressure Test (APT), and a Radioactive Tracer Survey (RTS). The well is completed in the Miocene Sand Interval and is utilized to dispose of storm water and liquids collected during site investigation and remediation at the Site.

The static bottomhole pressure survey was conducted to provide a historical reference point for the Miocene Sand Interval. The formation pressure is slightly higher than the measured pressure on March 15, 2005, but has decreased eight pounds per square inch (psi) since the October 21, 1999 survey.

The mechanical integrity test consisted of an APT and a RTS. The APT demonstrated the integrity of the wellhead, well casing, injection tubing, and injection packer. The RTS demonstrated that injected fluids are entering and remaining in the permitted injection interval. The Mechanical Integrity test conducted on WDW-138 successfully fulfilled the annual testing requirements for the well.

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1.0 INTRODUCTION

The MSC Superfund Site is located south of Texas City, Texas, near the southwest shore of Swan Lake in Galveston County, Texas. Aqueous wastes have been disposed of on site by deep well injection into the Miocene Formation, as authorized by the United States Environmental Protection Agency (USEPA). The facility currently collects storm water from selected units on site. The waters are managed in separate above ground areas and disposed of, as needed, into WDW-138 (Plant Well No. 2). WDW-73 (Plant Well No. 1) is maintained in a mandatory shut in status. Both wells are permitted for injection into the Miocene Sand Formation. Please refer to Figure 1 for a map of the MSC disposal wells.

This report presents the results of the recent bottomhole pressure (BHP) survey and mechanical integrity testing operations on WDW-138. The tests were performed in accordance with the Code of Federal Regulations (CFR) Title 40, \$146.68(d)(1), (d)(2), and (e)(1). The tests are also compliant with Texas Commission on Environmental Quality (TCEQ) Rule 31 TAC 331.64 (d) and (g)(2). This report includes a work summary, test data, and analysis.

On behalf of the Malone Cooperating Parties and at the request of URS Corporation (URS), Sandia Technologies, LLC (Sandia) planned the work, contracted necessary vendors, and supervised the required well tests on WDW-138. Field operations were performed on March 13, 2006.

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Sandia Technologies, LLC

1.1 Facility Information

Facility: Address:

Authorized Agent:

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2.0 OPERATIONS SUMMARY

A bottomhole pressure (BHP) survey and a mechanical integrity test (MIT) were conducted through WDW-138 to satisfy annual testing requirements for the well. The testing operations were conducted on March 13, 2006. Appendix A contains a log of the daily operations during the testing period. The current completion schematic for WDW-138 is presented in Figure 2.

Gulf Coast Well Analysis, Pearland, Texas (GCWA), provided wireline, pressure gauges, and pressure control services for the BHP survey and RTS. A memory pressure probe and RTS tools were lowered into the wellbore. Appendix B contains pressure data collected by GCWA during the BHP survey. The RTS was completed by GCWA after recording the BHP survey. Roywell Services, Baytown, Texas (Roywell), provided pumping services and K-Mac Vacuum Services, Alvin, Texas (K-Mac), provided fluid (KCl alternative in water) for the RTS.

The reference depth for this, and subsequent sections of this report, is the kelly bushing (KB) reference, which is 8.0 feet above the lowermost wellhead flange in WDW-138. Table 2-1 presents the current well completion data.

WDW-138 Well Completion Data					
Completion Data	Depth (feet KB)				
Injection Tubing, 2-7/8" O.D.	Surface to 3,552'				
Production Packer Depth	3,552' to 3,560'				
Protection Casing, 7", 20.0-ppf	3,560' to 3,854'				
Abandoned Packer Assembly	3,840' to 3,891'				
2-7/8" Stub	3,840' to 3,854'				
Packer	3,854' to 3,860'				
Tail Pipe	3,860' to 3,891'				
	4,162' to 4,237'				
Perforated Interval	4,242' to 4,260'				
(7" Protective Casing)	4,272' to 4,306'				
-	4,318' to 4,323'				
Top of Fill	4,271				

Table 2-1 W-138 Well Completion Da

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A high-resolution pressure transducer was connected to the tubing-casing annulus of WDW-138, and an annulus pressure test was conducted with a differential pressure in excess of 1,000 pounds per square inch (psi). Details of the test are included in Section 3.1.

The wireline unit was mobilized to the site and rigged up on the well. A Spartek Systems memory pressure probe and RTS tools were lowered into the wellbore on the wireline. Centralizers were run on the top and bottom of the tool assembly to insure the tool string would enter the cutoff tubing above the lower packer. Pressure gradient stops were made at surface, 1,000 feet, 2,000 feet, 3,000 feet, and 4,000 feet. The pressure probe was set at a depth of 4,142 feet. The BHP and temperature were monitored and recorded for 66 minutes. Details of the BHP survey are included in Section 3.2.

A fluid pump was mobilized to the MSC site and rigged up to WDW-138. A vacuum transport loaded with fresh water was mobilized to the location. A potassium chloride substitute was then added to the fresh water and mixed to obtain a 3% equivalent solution. The vacuum transport was then rigged up to the fluid pump truck.

A RTS was then performed. Details of the RTS are included in Section 3.3. The RTS tools were retrieved from the wellbore and all equipment was rigged down and released. The location was cleaned and crews exited the location.

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3.0 MECHANICAL INTEGRITY TEST

3.1 Annulus Pressure Test (APT)

Sandia conducted the APT on the morning of March 13, 2006. A Well Test Solutions SDS 3000 pressure probe (see Appendix C for pressure gauge documentation) was connected to the tubing-casing annulus of WDW-138, and the annular pressure was recorded for 55 minutes. An initial test pressure reading of 1,168.56 psia at 8:45 a.m. was recorded. During the thirty-minute APT, the annulus pressure dropped 6.14 pounds per square inch (psi) to an ending pressure of 1,162.42 psia at 9:15 a.m. The injection tubing was static throughout the test with an observed pressure of 76 psig. The 0.53 percent pressure change was within allowable limits for TCEQ approval (five-percent increase or decrease over the 30-minute the test duration). A record of the test data is included in Appendix D.

3.2 Bottomhole Pressure Survey

The well has been periodically used for fluid disposal since the last test on March 16, 2005. The well was shut in on March 6, 2006, at 5:10 P.M., and remained shut in until the testing operations were started. On the morning of March 13, 2006, a memory pressure probe (see Table 3-1 and Appendix C), RTS tools with casing collar locator, and two bow-spring centralizers were lowered into the well. As the tools were lowered into the wellbore, pressure gradient stops were conducted at surface and at 1,000-foot intervals. Following the 4,000-foot gradient stop, the pressure probe was positioned at 4,142 feet and allowed to stabilize for 66 minutes. Table 3-2 illustrates the hydrostatic measurements recorded during the survey. A graphic representation, printed data, and digital data disk are presented in Appendix B.

A review of the recorded memory gauge BHP data after removing the gauge from the wellbore indicated anomalous readings from the downhole gauge after 26 minutes of stabilized readings. It appears either the valve to the pump truck or the wing valve on the MSC flowline was momentarily opened and then immediately shut at 11:05:28 A.M. and at 11:35:58 A.M. This caused a minor pressure drawdown followed by a pressure buildup to be recorded. The total pressure drop was 17 psi and 16 psi at each respective occurrence. The pressure buildup returned to near the previous readings each time. The

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recorded pressure at 11:04:58 A.M. of 1,870.56 psig at 4,142 feet is considered the static reservoir pressure.

Pressure Gauge Information								
Pressure Gauge	Property	Value						
Gulf Coast Well Analysis								
Spartek Memory Gauge	Range	0 – 6,000 psia						
Serial No. 76390	Accuracy	±(0.025% of full scale + 0.01% of reading)						
	Manufacturer's Recommended Calibration Frequency	Annual						
Gauge Depth: 4,142 feet KB	Calibration Date	November 25, 2005						

Table 3-1Pressure Gauge Information

	Table	3-2	
WDW-138	Gradient	Survey	Summary

Depth (feet)	Measur ed Pr essure (psig)	Density Gradient (psi/ft)
4,142	1,870.56	0.4119
4,000	1,812.07	0.4371
3,000	1,374.95	0.4327
2,000	942.28	0.4343
1,000	508.02	0.4324
Surface	90.30	. N/A
	Average	0.4290

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3.3 Radioactive Tracer Survey (RTS)

The RTS was conducted on March 13, 2006, by GCWA under the supervision of Sandia. A copy of the survey and an interpretation letter from Mr. Stoney Johnson of GCWA are included in Appendix E. Table 2-1 and Figure 2 present well completion data for the test.

The wireline tools were lowered to the bottom of the well, and a depth correlation was made referencing the GCWA Radioactive Tracer Survey, dated March 15, 2005. The top of fill was located at 4,271 feet (same depth as 2005 RTS), indicating that the lowermost 40 feet of the 134 feet of total perforated interval is covered with solids and/or sand.

After an initial baseline gamma ray logging run, statistical time drive checks were performed with the lower gamma detector positioned at 3,830 feet and at 4,142 feet. Two moving flow profile surveys were performed next while injection was held constant at 42 gpm. The tracer material was monitored between 3,350 feet and 4,265 feet, with the radioactive slugs exiting the wellbore through the perforations, into the injection interval. Two stationary time-drive surveys were performed at an injection rate of 63 gpm, both with the tool positioned at 4,142 feet. The surveys showed no evidence of upward fluid movement. A summary of the logging runs is included in Table 3-3.

RUN NO.	RATE (gal/min)	P RESSURE (psig)	OPERATION
1	0	76	Ran initial baseline gamma ray log from 4,265 feet to 3,350 feet.
2-3	0	100	Statistical background checks at 3,830 feet and 4,142 feet.
4-8	42	300	Ejected Slug 1 at 3,350 feet. Monitored flow profile with five passes
9-14	42	400	Ejected Slug 2 at 3,350 feet. Monitored flow profile with six passes
15	63	450	Ejected Slug 3 at 4,142 feet. Ran 16-minute time drive at 4,142 feet.
16	63	450	Ejected Slug 4 at 4,142 feet. Ran 16-minute time drive at 4,142 feet.
17	0	300	Ran final baseline gamma ray log from 4,265 feet to 3,350 feet.

Table 3-3							
WDW-138 Radioactive Tracer Survey Logging Summary							

Note: Upper detector is located 3.0 feet above radioactive source and lower detector is 5.0 feet below source.

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The results of the moving and stationary surveys demonstrate that:

- All wellbore fluid is exiting through the perforated completion into the injection sand interval, and
- No fluid is flowing vertically out of the injection sand interval behind the casing.

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4.0 BOTTOMHOLE PRESSURE COMPARISON

A comparison of static bottomhole pressures measured in the Miocene Sand Injection Interval is included in this section.

4.1 Static Bottomhole Pressure

A static BHP of 1,870.56 psig was measured in WDW-138, at a gauge depth of 4,142 feet. The measured pressure is adjusted to a reference depth in order to compare historical pressures. The reference datum used for historical static BHP comparisons is 4,162 feet, the top of the perforated injection interval. The average density gradient of the fluid in the wellbore, as calculated from gradient stops, is 0.4290 psi/foot. The pressure adjustment value is calculated in Equation 4-1, below.

$$P_{adj} = (P_{meas}) + \left[\left(D_{ref} - D_{gauge} \right) \times DG_{fluid} \right]$$
(4-1)

where,

 $P_{adj} = Depth adjusted pressure, psig$ $P_{meas} = Measured pressure, psig$ $D_{ref} = Reference depth, feet$ $D_{gauge} = Gauge depth, feet$ $DG_{fluid} = Density gradient of test fluid, psi/ft$ $P_{adj} = (1870.56) + [(4162 - 4142) \times 0.4290]$

$$P_{adj} = 1879.14 \ psig$$

Substituting the required data into Equation 4-1 (above) yields a static BHP of 1,879.14 psig at the reference depth of 4,162 feet. Table 4-1 below compares the current data to historical reservoir test data in the Miocene Sand Injection Interval, with the final bottomhole pressure corrected to the reference depth. The year 2006 test pressure value is approximately 8 psi lower than value presented in 1999.

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Year	Static Pressure (psig)*
2006	1,879
2005	1,876
2004	1,877
2001	1,918
1999	1,887

Table 4-1 WDW-138 Historical Bottomhole Pressure Survey Comparison

* Corrected to the reference depth of 4,162 feet

Comparison is based on available test data.

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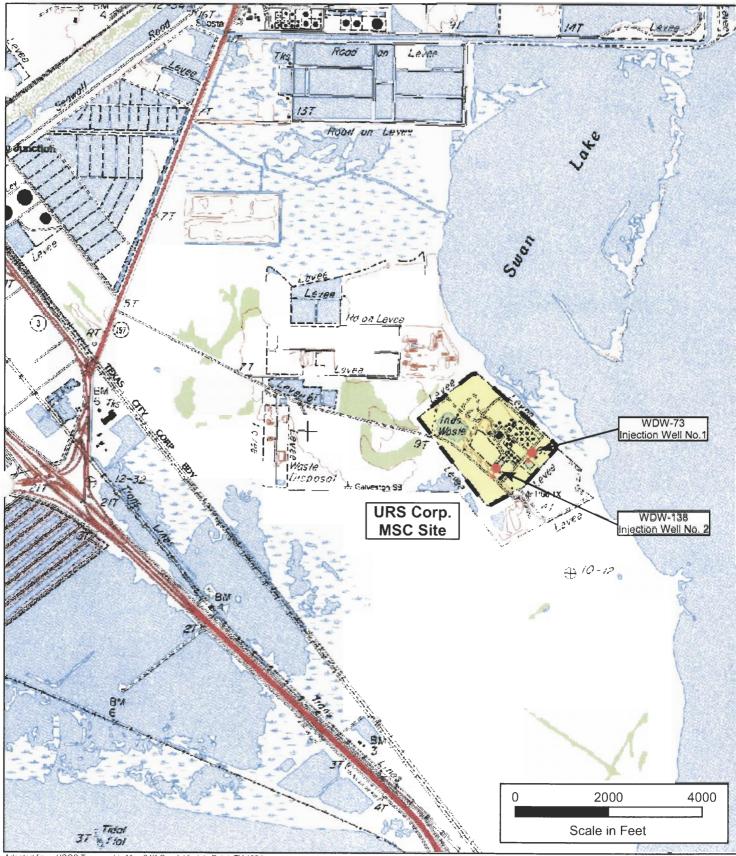
5.0 CONCLUSIONS

The static pressure recorded in WDW-138 was 1,870.56 psig at a depth of 4,142 feet. The measured bottomhole pressure is similar to 1999 historical measurements.

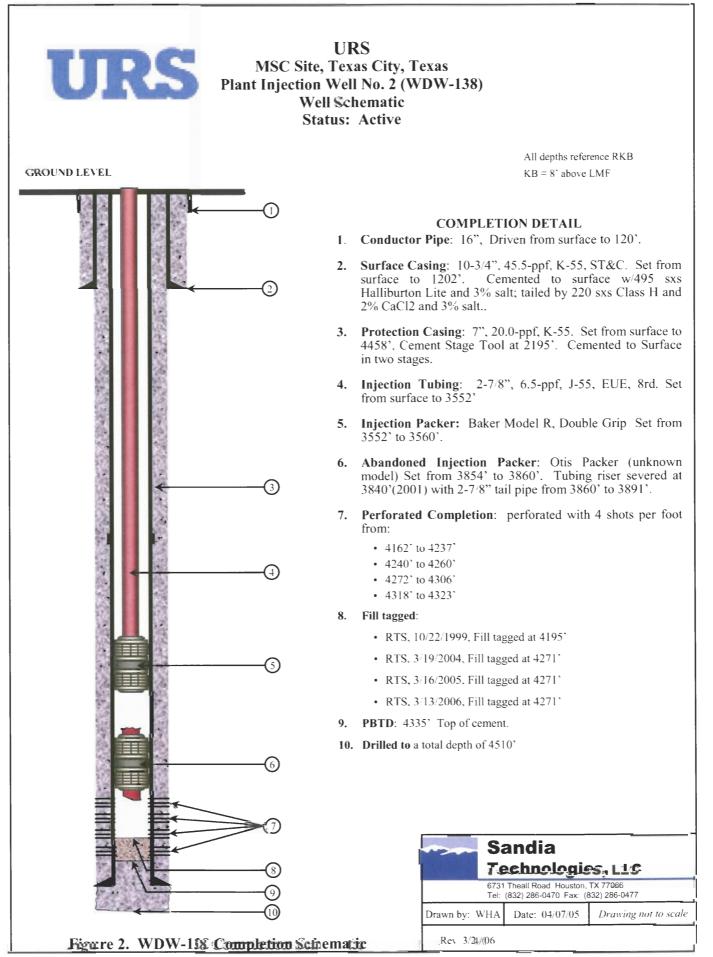
The Mechanical Integrity test conducted on WDW-138 successfully fulfilled the annual testing requirements for the well. The test, consisting of an Annulus Pressure Test and a Radioactive Tracer Survey, demonstrated the integrity of the materials used for well construction.

The Annulus Pressure Test on the well demonstrated that no leaks exist in the injection tubing, protection casing, packer, seal assembly, and wellhead systems. The Radioactive Tracer Survey on WDW-138 demonstrated that all injected fluids enter and remain confined within the subsurface sand structures below 4,142 feet.

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Adapted from. USGS Topographic Map 24K Quad; Virginia Point, TX 1994 Created by: ESSJ Sandia 4/19/04



			URS M	SC SIT	E, WDW-	138		S	Sandia Proj. N	lo: 839-	URS-06	Report Date	
	Site Su	pv. 1:	Grant		RKB-LMF:	8'	MD:	4,465	i' Casing	Size:	7"	Da Rig:	iy:: 1
	Site Su	pv. 2:			RKB-GL:		TVD:		Casing	Depth:	4,456 ft	BOP Tes	t:
	Current Operati		W-138 Annual		ents: None Rej ting	ported							
St	art Tim	ē				DA	ILY OPEF	ATIONS					
	7:00	Arrive	at Main Gate	and check	c in with Raaj F	Patel with L	JRS. Sandia	and GCWA	A proceeded	to well.	Conduct	tailgate safety	meeting.
	7:45	GCW.	A rigging up to	run botto	mhole pressur	e (BHP) an	nd radioactive	e tracer surv	/ey (RTS) ol	WDW-	138		0
	8:00				76 psig. Prepar	ing to run a	annulus pres	sure test (A	PT); URS i	ncreased	d pressure	e on	
	8:45		IS USING ANNU		re pump. e of 1,168.56 p	aia					1		
	0.40	-			ell with Spartek		auge and R	ES tools ima	akina pressi	uré aradia	ent stone		
	9:15		est pressure o			i i i i i i i i i i i i i i i i i i i	Joogo ana it		aning presse	ne gradit	sint atopa		
		Press	ure gradient da	ata - surfac	ce - 75.6 psig,								
		4,000	ft - 1812.07 ps	ig. Tool s	tring included	RTS tools	and memory	gauge with	centralizers	and top			
	10:04				y survey from 4			t checks at	3830 & 4142	2 ft.			
	10:38	•		-	bing below aba	•							
					essure of 1,874 Vacuum truck								
					gged fill at a w				naceoe the	nuah sha	andoned -	nacker	-
			cutoff tubing			nomic dep		. 1110 10013	passes the	bugii abe	andoneu j	Jacker	
			-	-									
		Condu	t 2 moving flo	w profile s	surveys from 4	265-3350 f	t while inject	ing at 42 gp	m @ 300 ps	si.			
	13:17	Condu	t 2 stationary	time-drive	surveys at 41	42 ft while	injecting at 6			si.			
	13:17 14:03	Conduc Conduc	t 2 stationary t final baseline	time-drive e gamma	surveys at 41 ray survey fror	42 ft while n 4265 to 3	injecting at 6 3350 ft.	3 gpm @ 4	50 psi.	sí.			
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	13:17 14:03 14:30 14:45 15:15	Conduc Conduc Remov Rig dou Install	t 2 stationary t final baseline e logging tools vn GCWA and	time-drive e gamma s from well l release w plug and ga	surveys at 41 ray survey fror Ibore. Rig dow vireline. auge.	42 ft while n 4265 to 3	injecting at 6 3350 ft.	3 gpm @ 4	50 psi.	si.			
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Na PRO C	13:17 14:03 14:30 14:45 15:15 15:30 otes: Fluid R	Conduc Conduc Remov Rig dor Install Secure ecord:	t 2 stationary t final baseline e logging tools vn GCWA and wellhead bull p location. Field Fime: DH: CSG1 Size: CSG2 Size: CSG3 Size:	time-drive e gamma s from well i release w blug and g d operation Dep Filt:	e surveys at 41. ray survey fror Ibore. Rig dow vireline. auge. ns complete. 	42 ft while n 4265 to 3 vn and rele MW: C e: K-55 e: e: e: e:	injecting at 6 3350 ft. ase Roywell FV: CI: CSG1 Wt. CSG2 Wt. CSG3 Wt. Liner Wt.:	3 gpm @ 4 and K-Mac. PV: Ca: 20-ppf	50 psi. 50 psi. YP: Day's C CSG1 Cor CSG2 Cor CSG3 Cor Liner Cor	Gel (1) pst: nn.: nn.: nn.: nn.:		Cumulative: CSG1 TD: CSG2 TD: CSG3 TD: Liner Depth:	
	13:17 14:03 14:30 14:45 15:15 15:30 otes: Fluid R DUCTIC	Conduc Conduc Remov Rig dor Install Secure ecord:	t 2 stationary t final baseline e logging tools vn GCWA and wellhead bull p location. Field Fime: DH: CSG1 Size: CSG2 Size: CSG3 Size: Liner Size: TBG1 Size: TBG2 Size:	time-drive e gamma s from wells l release w olug and g d operation Dep Filt: 7"	e surveys at 41. ray survey fror Ibore. Rig dow vireline. auge. ns complete. th: Alk: CSG1 Grade CSG2 Grade CSG3 Grade	42 ft while n 4265 to 3 vn and rele MW: C e: K-55 e: e: Unknowr	injecting at 6 3350 ft. ase Roywell FV: CI: CSG1 Wt. CSG2 Wt. CSG3 Wt. Liner Wt.:	3 gpm @ 4 and K-Mac. PV: Ca: 20-ppf Unknown	50 psi. 50 psi. YP: Day's C CSG1 Cor CSG2 Cor CSG3 Cor Liner Cor	Gel (1 ost: nn.: nn.: nr.: n.: EUI		Cumulative: CSG1 TD: CSG2 TD: CSG3 TD:	4456' 3552'
	13:17 14:03 14:30 14:45 15:15 15:30 otes: Fluid R Fluid R DUCTIC	Conduc Conduc Remov Rig dor Install Secure ecord:	t 2 stationary t final baseline e logging tools vn GCWA and wellhead buil p location. Field Fime: DH: CSG1 Size: CSG2 Size: CSG3 Size: Liner Size: TBG1 Size:	time-drive e gamma s from wells l release w olug and g d operation Dep Filt: 7"	e surveys at 41. ray survey fror Ibore. Rig dow vireline. auge. ns complete. 	42 ft while n 4265 to 3 wn and rele www. MW: C www. C c c c c c c c c c c c c c c c c c c	injecting at 6 3350 ft. ase Roywell FV: Cl: CSG1 Wt. CSG2 Wt. CSG3 Wt. Liner Wt.: n TBG1 Wt.:	3 gpm @ 4 and K-Mac. PV: Ca: 20-ppf Unknown	50 psi. 50 psi. YP: Day's Co CSG1 Cor CSG2 Cor CSG3 Cor Liner Cor TBG1 Con	Gel (1) pst: nn.: nn.: nr.: n.: EUI n.:		Cumulative: CSG1 TD: CSG2 TD: CSG3 TD: Liner Depth: TBG1 TD:	
	13:17 14:03 14:30 14:45 15:15 15:30 otes: Fluid R DUCTIO ASING	Conduc Conduc Remov Rig don Install Secure ecord:	t 2 stationary t final baseline e logging tools wn GCWA and wellhead bull p location. Field Time: oH: CSG1 Size: CSG2 Size: CSG3 Size: Liner Size: TBG1 Size: TBG2 Size: TBG3 Size:	time-drive e gamma s from wells release w olug and g d operation Dep Filt: 7" 2-7/8"	e surveys at 41. ray survey fror Ibore. Rig dow vireline. auge. ns complete. 	42 ft while n 4265 to 3 wn and rele MW: C E E E E E E E E E E E E E E E E E E	injecting at 6 3350 ft. ase Roywell FV: CSG1 Wt. CSG2 Wt. CSG3 Wt. Liner Wt.: TBG1 Wt.: TBG2 Wt.: TBG3 Wt.:	3 gpm @ 4 and K-Mac. PV: Ca: 20-ppf Unknown	50 psi. 50 psi. YP: Day's Cl CSG1 Cor CSG2 Cor CSG3 Cor Liner Cor TBG1 Con TBG2 Con TBG3 Con	Gel (1) pst: nn.: nn.: nr.: n.: EUI n.:	E-8rd	Cumulative: CSG1 TD: CSG2 TD: CSG3 TD: Liner Depth: TBG1 TD: TBG2 TD:	3552
	13:17 14:03 14:30 14:45 15:15 15:30 otes: Fluid R DUCTIO ASING	Conduc Conduc Remov Rig don Install Secure ecord:	t 2 stationary t final baseline e logging tools wn GCWA and wellhead bull p location. Field Time: oH: CSG1 Size: CSG2 Size: CSG3 Size: Liner Size: TBG1 Size: TBG2 Size: TBG3 Size:	time-drive e gamma s from wells release w olug and g d operation Dep Filt: 7" 2-7/8"	surveys at 41 ray survey fror lbore. Rig dow vireline. auge. ns complete. 	42 ft while n 4265 to 3 wn and rele MW: C e: K-55 e: e: Unknowr e: S g & Mod: B	Injecting at 6 3350 ft. ase Roywell FV: CSG1 Wt. CSG2 Wt. CSG3 Wt. Liner Wt.: TBG1 Wt.: TBG3 Wt.: Baker Model	3 gpm @ 4 and K-Mac. PV: Ca: 20-ppf Unknown	50 psi. 50 psi. YP: Day's Con CSG1 Con CSG2 Con CSG3 Con Liner Cor TBG1 Con TBG2 Con TBG3 Con Jon Pkr: 3	Gel (1) post: nn.: nn.: n.: n.: EUI n.:	E-8rd 1' Perfo	Cumulative: CSG1 TD: CSG2 TD: CSG3 TD: Liner Depth: TBG1 TD: TBG2 TD: TBG3 TD:	3552
	13:17 14:03 14:30 14:45 15:15 15:30 otes: Fluid R Fluid R DUCTIC ASING	Conduc Conduc Remov Rig dou Install Secure ecord: ON	t 2 stationary t final baseline e logging tools wn GCWA and wellhead bull p location. Field Time: oH: CSG1 Size: CSG2 Size: CSG3 Size: Liner Size: TBG1 Size: TBG3 Size: TBG3 Size: TBG3 Size: TBG3 Size:	time-drive e gamma s from wells release w olug and g d operation Dep Filt: 7" 2-7/8"	e surveys at 41. ray survey fror lbore. Rig dow vireline. auge. ns complete. 	42 ft while n 4265 to 3 wn and rele MW: C E: K-55 e: C E: K-55 e: C E: C nknowr e: C E: C E: C E: C E: C E: C E: C E: C E	Injecting at 6 3350 ft. ase Roywell FV: CSG1 Wt. CSG2 Wt. CSG3 Wt. Liner Wt.: TBG1 Wt.: TBG3 Wt.: Baker Model	3 gpm @ 4 and K-Mac. PV: Ca: 20-ppf Unknown ₹ Aband 4,272' to 4,3	50 psi. YP: Day's C CSG1 Cor CSG2 Cor CSG3 Cor Liner Cor TBG1 Con TBG2 Con TBG3 Con Jon Pkr: 3 305' Pei	Gel (1) ost: nn.: nn.: n.: n.: 840'-389 forations	E-8rd 1' Perfo	Cumulative: CSG1 TD: CSG2 TD: CSG3 TD: Liner Depth: TBG1 TD: TBG2 TD: TBG3 TD: orations 1: 4,16 4,316 to 4,323'	3552' 2' to 4,237
	13:17 14:03 14:30 14:45 15:15 15:30 otes: Fluid R PDUCTIC ASING	Conduc Conduc Remov Rig dou Install Secure ecord: ON	t 2 stationary t final baseline e logging tools wn GCWA and wellhead bull p location. Field Time: oH: CSG1 Size: CSG3 Size: CSG3 Size: CSG3 Size: CSG3 Size: TBG1 Size: TBG3 Size: TBG3 Size: T: Packer De Perforati	time-drive e gamma s from wells release w olug and g d operation Dep Filt: 7" 2-7/8"	e surveys at 41 ray survey fror Ibore. Rig dow vireline. auge. ns complete. th: Alk: CSG1 Grade CSG2 Grade CSG3 Grade CSG3 Grade TBG1 Grade TBG2 Grade TBG3 Grade -3560' Pkr Mfg 4,249' to 4,260'	42 ft while n 4265 to 3 wn and rele wn and rele MW: C C C C C C C C C C C C C C C C C C C	Injecting at 6 3350 ft. ase Roywell FV: CSG1 Wt. CSG2 Wt. CSG3 Wt. CSG3 Wt. TBG1 Wt. TBG1 Wt. TBG2 Wt. Baker Model ations 3:	3 gpm @ 4 and K-Mac. PV: Ca: 20-ppf Unknown ₹ Aband 4,272' to 4,3	50 psi. 50 psi. YP: Day's Con CSG1 Con CSG2 Con CSG3 Con Liner Cor TBG1 Con TBG2 Con TBG3 Con Jon Pkr: 3	Gel (1) ost: nn.: nn.: n.: EUI n.: 840'-389 forations	E-8rd 1' Perfo	Cumulative: CSG1 TD: CSG2 TD: CSG3 TD: Liner Depth: TBG1 TD: TBG2 TD: TBG3 TD: orations 1: 4,16	3552' 2' to 4,237 h:
	13:17 14:03 14:30 14:45 15:15 15:30 otes: Fluid R Fluid R DUCTIC ASING	Conduc Conduc Remov Rig dou Install Secure ecord: ON	t 2 stationary t final baseline e logging tools wn GCWA and wellhead bull p location. Field Time: oH: CSG1 Size: CSG2 Size: CSG3 Size: CSG3 Size: Liner Size: TBG1 Size: TBG3 Size: TBG3 Size: T: Packer Dep Perforati Pipe1 Size: Pipe2 Size: DC1 Size:	time-drive e gamma s from wells release w olug and g d operation Dep Filt: 7" 2-7/8"	e surveys at 41. ray survey fror ibore. Rig dow vireline. auge. ns complete. 	42 ft while n 4265 to 3 wn and rele wn and rele MW: C C C C C C C C C C C C C C C C C C C	Injecting at 6 3350 ft. ase Roywell FV: CSG1 Wt. CSG2 Wt. CSG3 Wt. CSG3 Wt. TBG1 Wt. TBG2 Wt. TBG3 Wt. Baker Model ations 3: Pipe1 V	3 gpm @ 4 and K-Mac. PV: Ca: 20-ppf Unknown R Aband 4,272' to 4,3 Vt.: Vt.:	50 psi. 50 psi. YP: Day's Cr CSG1 Cor CSG2 Cor CSG3 Cor Liner Cor TBG1 Con TBG2 Con TBG3 Con TBG3 Con don Pkr: 3: 305' Per Pipe1 To	Gel (1) pst: nn.: nn.: n.: EUI n.: 840'-389 forations forations pol Jt.: pol Jt.:	E-8rd 1' Perfo	Cumulative: CSG1 TD: CSG2 TD: CSG3 TD: Liner Depth: TBG1 TD: TBG2 TD: TBG3 TD: orations 1: 4,16 4,316 to 4,323' Pipe1 Lengt	3552' 2' to 4,237 h: h:
	13:17 14:03 14:30 14:45 15:15 15:30 otes: Fluid R PDUCTIC ASING	Conduc Conduc Remov Rig dou Install Secure ecord: ON	t 2 stationary t final baseline e logging tools wn GCWA and wellhead bull p location. Field Time: oH: CSG1 Size: CSG2 Size: CSG3 Size: Liner Size: TBG3 Size: TBG3 Size: TBG3 Size: TBG3 Size: Perforati	time-drive e gamma s from wells release w olug and g d operation Dep Filt: 7" 2-7/8"	e surveys at 41. ray survey fror ibore. Rig dow vireline. auge. ns complete. 	42 ft while n 4265 to 3 wn and rele wn and rele MW: C C C C C C C C C C C C C C C C C C C	Injecting at 6 3350 ft. ase Roywell FV: CSG1 Wt. CSG2 Wt. CSG3 Wt. Liner Wt.: TBG1 Wt.: TBG2 Wt.: TBG3 Wt.: Baker Model I ations 3: Pipe1 V Pipe2 V	3 gpm @ 4 and K-Mac. PV: Ca: 20-ppf Unknown R Aband 4.272' to 4,3 Vt.: Vt.: ts:	50 psi. 50 psi. YP: Day's Co CSG1 Cor CSG2 Cor CSG3 Cor Liner Cor TBG1 Con TBG2 Con TBG3 Con TBG3 Con TBG3 Con Con Pkr: 3 305' Per Pipe1 To Pipe2 To	Gel (1) post: in.: in.: in.: in.: in.: forations forations pool Jt.: pool Jt.: pool Jt.:	E-8rd 1' Perfo	Cumulative: CSG1 TD: CSG2 TD: CSG3 TD: Liner Depth: TBG1 TD: TBG2 TD: TBG3 TD: orations 1: 4,16 4,316 to 4,323' Pipe1 Lengt Pipe2 Lengt	3552' 2' to 4,237 h: h:
	13:17 14:03 14:30 14:45 15:15 15:30 otes: Fluid R DUCTIO ASING IECTION UBING IPLETIC RKSTRI	Conduc Conduc Remov Rig don Install Secure ecord: ON ON	t 2 stationary t final baseline e logging tools wn GCWA and wellhead bull p location. Field Time: oH: CSG1 Size: CSG2 Size: CSG3 Size: CSG3 Size: Liner Size: TBG1 Size: TBG3 Size: TBG3 Size: T: Packer Dep Perforati Pipe1 Size: Pipe2 Size: DC1 Size:	time-drive e gamma s from wells release w blug and g d operation Dep Filt: 7" 2-7/8" pth: 3552'- ons 2: 4	e surveys at 41. ray survey fror ibore. Rig dow vireline. auge. ns complete. 	42 ft while n 4265 to 3 wn and rele wn and rele MW: C C C C C C C C C C C C C C C C C C C	Injecting at 6 3350 ft. ase Roywell FV: CSG1 Wt. CSG2 Wt. CSG3 Wt. Liner Wt.: TBG1 Wt.: TBG2 Wt.: TBG3 Wt.: Baker Model I ations 3: Pipe1 V Pipe2 V DC1 #J	3 gpm @ 4 and K-Mac. PV: Ca: 20-ppf Unknown R Aband 4.272' to 4,3 Vt.: Vt.: ts:	50 psi. 50 psi. YP: Day's Cl CSG1 Cor CSG2 Cor CSG3 Cor Liner Cor TBG1 Con TBG2 Con TBG3 Con TBG3 Con don Pkr: 3 305' Per Pipe1 To Pipe2 To DC1 To DC2 To	Gel (1) ost: nn.: nn.: n.: n.: 840'-389 forations ool Jt.: pool Jt.: pool Jt.:	E-8rd 1' Perfc 3 4: 4	Cumulative: CSG1 TD: CSG2 TD: CSG3 TD: Liner Depth: TBG1 TD: TBG2 TD: TBG3 TD: TBG3 TD: orations 1: 4,16 4,316 to 4,323' Pipe1 Lengt Pipe2 Lengt DC1 Length	3552' 2' to 4,237 h: h:
	13:17 14:03 14:30 14:45 15:15 15:30 otes: Fluid R Fluid R DUCTIC ASING IECTION UBING IPLETIC RKSTRIM	Conduc Conduc Remov Rig dou Install Secure ecord: ON ON ON ON CON EQF	t 2 stationary t final baseline e logging tools vn GCWA and wellhead bull p location. Field Fime: DH: CSG1 Size: CSG3 Size: CSG3 Size: CSG3 Size: TBG1 Size: TBG1 Size: TBG3 Size: T: Packer De Perforati Pipe1 Size: DC1 Size: DC2 Size:	time-drive e gamma s from wells release w blug and g d operation Dep Filt: 7" 2-7/8" pth: 3552'- ons 2: 4	e surveys at 41. ray survey fror ibore. Rig dow vireline. auge. ns complete. 	42 ft while n 4265 to 3 wn and rele wn and rele MW: C C C C C C C C C C C C C C C C C C C	Injecting at 6 3350 ft. ase Roywell FV: CSG1 Wt. CSG2 Wt. CSG3 Wt. Liner Wt.: TBG1 Wt.: TBG2 Wt.: TBG3 Wt.: Baker Model I ations 3: Pipe1 V Pipe2 V DC1 #J	3 gpm @ 4 and K-Mac. PV: Ca: 20-ppf Unknown R Aband 4.272' to 4,3 Vt.: Vt.: ts:	50 psi. 50 psi. YP: Day's Cl CSG1 Cor CSG2 Cor CSG3 Cor Liner Cor TBG1 Con TBG2 Con TBG3 Con TBG3 Con don Pkr: 3 305' Per Pipe1 To Pipe2 To DC1 To DC2 To	Gel (1) ost: nn.: nn.: n.: n.: 840'-389 forations ool Jt.: pool Jt.: pool Jt.:	E-8rd 1' Perfc 5 4: 4	Cumulative: CSG1 TD: CSG2 TD: CSG3 TD: Liner Depth: TBG1 TD: TBG2 TD: TBG3 TD: orations 1: 4,16 4,316 to 4,323' Pipe1 Length Pipe2 Length DC1 Length DC2 Length	3552' 2' to 4,237 h: h:
	13:17 14:03 14:30 14:45 15:15 15:30 otes: Fluid R DUCTIO ASING IECTION UBING IPLETIC RKSTRI	Conduc Conduc Remov Rig dou Install Secure ecord: ON ON ON ON CON EQF	t 2 stationary t final baseline e logging tools vn GCWA and wellhead bull p location. Field Fime: DH: CSG1 Size: CSG3 Size: CSG3 Size: CSG3 Size: TBG1 Size: TBG1 Size: TBG3 Size: T: Packer De Perforati Pipe1 Size: DC1 Size: DC2 Size:	time-drive e gamma s from wells release w olug and g d operation Dep Filt: 2-7/8" 2-7/8" ons 2: 4	e surveys at 41. ray survey fror ibore. Rig dow vireline. auge. ns complete. 	42 ft while n 4265 to 3 yn and rele wn and rele MWV: C e: K-55 e: e: Unknowr e: S g & Mod: B g & Mod: B g & Mod: B g & Perfora	Injecting at 6 3350 ft. ase Roywell FV: CSG1 Wt. CSG2 Wt. CSG3 Wt. Liner Wt.: TBG2 Wt.: TBG3 Wt.: Baker Model I ations 3: Pipe1 V Pipe2 V DC1 #J DC2 #J	3 gpm @ 4 and K-Mac. PV: Ca: 20-ppf Unknown R Aband 4.272' to 4,3 Vt.: Vt.: ts:	50 psi. 50 psi. YP: Day's Cr CSG1 Cor CSG2 Cor CSG3 Cor Liner Cor TBG1 Con TBG2 Con TBG3 Con TGG3 Con TG	Gel (1) ost: nn.: nn.: n.: n.: 840'-389 forations ool Jt.: pool Jt.: pool Jt.:	E-8rd 1' Perfc 5 4: 4 International	Cumulative: CSG1 TD: CSG2 TD: CSG3 TD: Liner Depth: TBG1 TD: TBG2 TD: TBG3 TD: orations 1: 4,16 4,316 to 4,323' Pipe1 Length Pipe2 Length DC1 Length DC2 Length	3552' 2' to 4,237 h: h:
	13:17 14:03 14:30 14:45 15:15 15:30 otes: Fluid R Fluid R DUCTIC ASING IECTION UBING IPLETIC RKSTRIM	Conduc Conduc Remov Rig dou Install Secure ecord: ON ON ON ON CON EQF	t 2 stationary t final baseline e logging tools vn GCWA and wellhead bull p location. Field Fime: DH: CSG1 Size: CSG3 Size: CSG3 Size: CSG3 Size: TBG1 Size: TBG1 Size: TBG3 Size: T: Packer De Perforati Pipe1 Size: DC1 Size: DC2 Size:	time-drive e gamma s from wells release w blug and g d operation Dep Filt: 7" 2-7/8" pth: 3552'- ons 2: 4	e surveys at 41. ray survey fror ibore. Rig dow vireline. auge. ns complete. 	42 ft while n 4265 to 3 wn and rele wn and rele MW: C C C C C C C C C C C C C C C C C C C	Injecting at 6 3350 ft. ase Roywell FV: CSG1 Wt. CSG2 Wt. CSG3 Wt. Liner Wt.: TBG1 Wt.: TBG2 Wt.: TBG3 Wt. Baker Model I ations 3: Pipe1 V Pipe2 V DC1 #J DC2 #J	3 gpm @ 4 and K-Mac. PV: Ca: 20-ppf Unknown R Aband 4.272' to 4,3 Vt.: Vt.: ts:	50 psi. 50 psi. YP: Day's Cr CSG1 Cor CSG2 Cor CSG3 Cor Liner Cor TBG1 Con TBG1 Con TBG2 Con TBG3 Con TBG3 Con On Pkr: 3: 305' Per Pipe1 Tr Pipe2 Tr DC1 Tr DC2 Tr DC2 Tr ROT WT:	Gel (1) ost: nn.: nn.: n.: n.: 840'-389 forations ool Jt.: pool Jt.: pool Jt.:	E-8rd 1' Perfc 5 4: 4 International	Cumulative: CSG1 TD: CSG2 TD: CSG3 TD: Liner Depth: TBG1 TD: TBG2 TD: TBG3 TD: orations 1: 4,16 4,316 to 4,323' Pipe1 Length Pipe2 Length DC1 Length DC2 Length	3552' 2' to 4,237 h: h:

APPENDIX B

Gulf Coast Well Analysis Pressure Survey – WDW-138

Company:	URS Corp	oration			Gauge Manufacturer: Spartek Systems			Survey Da	ate(s)	March 13	2006
Well:	WDW-138				Gauge Serial No.: 76390			Burvey De	no (3).	Intaroll 15	,2000
Field:	Swan Lake		ity Tevas		Calibration Date: 11/25/05						
Record #	T					<u></u>					
Kecora #	Actual	Elapsed	BHP	BHT	Comments	Record #	Actual	Elapsed	BHP	BHT	
	Time	Time	(PSIG)	<u>(°F)</u>			Time	Time	(PSIG)	(°F)	
1	8:37:00	0	3.114		Zero Time Reading	51	8:57:28	0.34111	75.082	72.9	
2 3	8:37:05	0.00139	2.673	73.3		52	8:57:58	0.34944	75,232	72.8	
4	8:37:10 8:37:15	0.00278	2.716	73.4		53	8:58:28	0.35778	75.603		Wellhead Pressure
5	8:37:20	0.00417 0.00556	2.676	73.4		54	8:58:58	0.36611	84.651	72.6	
6	8:37:25	0.00558	2.676 2.651	73.4 73.4		55	8:59;28	0.37444	98.772	73.0	
7	8:37:30	0.00833	2.606	73.4		56 57	8:59:58	0.38278	120.364	73.1	
8	8:37:35	0.00972	2.610	73.5		57 58	9:00:28	0.39111	147.645	73.0	
9	8:37:40	0.01111	2.609	73.5		59	9:00:58	0.39944 0.40778	174.851	73.2	
10	8:37:45	0.01250	2.609	73.5		60	9:01:28 9:01:58	0.40778	202.418 230.972	73.7 74.3	
11	8:37:50	0.01389	2.609	73.5		61	9:02:28	0.42444	259.076	74.3	
12	8:37:55	0.01528	2.589	73,5		62	9:02:58	0.42444	287.491	75.0	
13	8:38:28	0.02444	2,578	73.5		63	9:03:28	0.43270	315,616	76.5	
14	8:38:58	0.03278	2.585	73,6		64	9:03:58	0.44944	343.860	73.3	
15	8:39:28	0.04111	2.664	73.7		65	9:04:28	0.45778	371.776	78.2	
16	8:39:58	0.04944	2.661	73.8		66	9:04:58	0.46611	400.114	79.0	
- 17	8:40:28	0.05778	2.662	73.9		67	9:05:28	0.47444	427.791	79.7	
18	8:40:58	0.06611	2.663	74.0	1	68	9:05:58	0.48278	455.546	80,6	
19	8:41:28	0.07444	2.710	74.2		69	9:06:28	0.49111	483,300	81,3	
20	8:41:58	0.08278	2.733	74.5		70	9:06:58	0.49944		82,1	
21	8:42:28	0.09111	2.729	74.6		71	9:07:28	0.50778		82.5	
22	8:42:58	0.09944	2.731	74.7		72	9:07:58	0.51611		82,6	
23	8:43:28	0.10778	2.728	74.8		73 74	9:08:28	0.52444	508.637	82.6	
24	8:43:58	0.11611	2.748	74.8		74	9:08:58	0.53278	508,483	82,6	i
25	8:44:28	0.12444	2.779	74.9		75 76 77	9:09:28	0.54111	508.404	82,6	
26 27	8:44:58	0.13278	2.752	75.0		76	9:09:58	0.54944	508.305	82.7	
27	8:45:28 8:45:58	0.14111	2.756	75.0		77	9:10:28	0.55778	508,239	82.7	
29	8:46:28	0.14944 0.15778	2.736	75.0		78	9:10:58	0.56611	508,175		
30	8:46:58	0.15778	2.750 2.735	75.0		79	9:11:28	0.57444	508,133	82.7	
31	8:47:28	0.17444	2.735	75.0 75.1		80	9:11:58	0.58278			
32	8:47:58	0.18278	2.890	75.1		81	9:12:28	0.59111	508.015		End Gradient Stop 1,000' (depth uncorrected)
33	8:48:28	0.19111	87.031	74.2		82	9:12:58	0.59944	528.887	82.5	
34	8:48:58	0.19944	69.127	73.2		83	9:13:28	0.60778			
35	8:49:28	0.20778	67.821	73.1		84 85	9:13:58	0.61611			
36	8:49:58	0.21611	68.666	73.1		86	9:14:28 9:14:58	0.62444 0.63278			
37	8:50:28	0.22444	69.633	73.1		87	9:15:28	0.63278			
38	8:50:58	0.23278		73.1		88	9:15:58	0.64944		86.6	
39	8:51:28	0.24111	70,850	73,2		89	9:16:28	0.65778	744,484	87.4	
40	8:51:58	0.24944	71.276			90	9:16:58	0.66611		88.2	
41	8:52:28	0.25778				91	9:17:28	0.67444			
42	8:52:58	0.26611	71.948			92	9:17:58	0.68278			
43	8:53:28	0,27444	72.236			93	9:18:28	0.69111			
44	8:53:58	0.28278	72.448			94	9:18:58	0.69944			
45	8:54:28	0.29111	72.663	73.3		95	9:19:28	0.70778			
46	8:54:58	0.29944				96	9:19:58	0.71611			
47	8:55:28	0.30778				97	9:20:28	0.72444			
48	8:55:58	0.31611	73.179	73.4	4	98	9:20:58	0.73278			
49 50	8:56:28 8:56:58	0.32444 0.33278			4	99 100	9:21:28	0.74111		92.9	

Appendix B

Gauge Manufacturer:	Spartek Systems
Gauge Serial No.:	76390

Company.	URS Corp	oration			Gauge Manufacturer: Spartek Systems			0 D	4.7.5	14 1 10	2 007
Well:	WDW-13							Survey Da	tte(s):	March 13,	,2006
Field:			·		Gauge Serial No.: 76390						
		e, <u>Texas</u> C	ity, rexas		Calibration Date: 11/25/05						
Record #	Actual	Elapsed	BHP	BHT	Comments	Record #	Actual	Elapsed	BHP	BHT	
	Time	Time	(PSIG)	_(°F)_			Time	Time	(PSIG)	(°F)	
101	9:22:28	0.75778	943.006	92.9	······································	151	9:47:28	1.17444	1596.227	109.9	
102	9:22:58	0.76611	942.860	92.9		152	9:47:58	1.18278	1615,726	110.6	
103 104	9:23:28	0.77444	942.720	92.9		153	9:48:28	1.19111	1635.424	111.2	
104	9:23:58 9:24:28	0.78278 0.79111	942.600 942.483	92.9		154	9:48:58	1.19944	1654.938	111.6	
106	9:24:58	0.79944	942.465	92.9 92.9		155	9:49:28	1.20778	1674.471	112.2	
107	9:25:28		942.283		End Gradient Stop 2,000	156 157	9:49:58 9:50:28	1.21611 1.22444	1694.024 1713.436	112.7	
108	9:25:58	0.81611	954.925	93.1	isila Gradient Stop 2,000	157	9:50:28	1.23278	1732.876	113.2 113.7	
109	9:26:28	0.82444	974.944	93.4		159	9:51:28	1,24111		113.8	
110	9:26:58	0.83278	999.131	93.9		160	9:51:58	1.24944	1771.382	112.9	
111	9:27:28	0.84111	1022.883	94.3		161	9:52:28	1.25778	1790,732	109.6	
112	9:27:58	0.84944	1046.659	94.9		162	9:52:58	1,26611		105.4	
113	9:28:28	0.85778	1070.526	95.4		163	9:53:28	1.27444	1813.572	101.7	
114	9:28:58	0.86611		96.1		164	9:53:58	1.28278			
115	9:29:28			96.7		165	9:54:28	1.29111	1813.239	100.8	
116	9:29:58		1141.223	97.3		166	9:54:58	1.29944	1813.054	100.6	
117	9:30:28	0.89111	1164.666	97.9		167	9:55:28	1.30778		100.5	
118 119	9:30:58 9:31:28		1196.255			168	9:55:58	1.31611			
120	9:31:28		1229.045 1261.538			169	9:56:28	1.32444	1812.623	100.3	
120	9:32:28					170	9:56:58	1,33278	1812.511	100.2	
122	9:32:58	0.93278	1326.599			171	9:57:28	1.34111	1812,400	100.1	
123	9:33:28	0.94111				172 173	9:57:58 9:58:28	1,34944 1.35778	1812.318 1812.229	100.1	
124	9:33:58		1377.818			174	9:58:58	1.36611	1812.142	100.0 100.0	
125	9:34:28					175	9:59:28	1.37444	1812.068	100.0	End Gradient Stop 4,000
126	9:34:58		1376.848			176	9:59:58	1.38278	1825,208	99.3	
127	9:35:28					177	10:00:28	1.39111	1842,304	96.0	
128	9:35:58					178	10:00:58	1.39944	1859.539	90,9	1
129	9:36:28		1376.123			179	10:01:28	1.40778	1876,988	87.6	
130	9:36:58		1375.940			180	10:01:58	1.41611		86.7	
131 132	9:37:28					181	10:02:28	1.42444	1912.329	88.2	
132	9:37:58 9:38:28	1.01611	1375.625 1375.495	104.4		182	10:02:58	1.43278		91.0	
133	9:38:58					183	10:03:28	1.44111	1929,703		
135	9:39:28					184	10:03:58	1.44944			
136	9:39:58		1375.178			185 186	10:04:28	1.45778		93.6	
137	9:40:28					187	10:04:58 10:05:28	1.46611 1.47444		93.1	
138	9:40:58					188	10:05:58	1.4/444			
139	9:41:28				End Gradient Stop 3,000	189	10:06:28	1.40270			
140	9:41:58					190	10:06:58	1.49944			
141	9:42:28	1.09111				191	10:07:28	1.50778) 88.6	
142	9:42:58			105.2		192	10:07:58	1.51611			
143	9:43:28					193	10:08:28	1.52444	1862.578	8 87.0	
144	9:43:58					194	10:08:58		1856.455	5 86.7	
145	9:44:28					195	10:09:28	1.54111	1850,282	2 86.8	
146	9:44:58					196	10:09:58				
147 148	9:45:28					197	10:10:28				
148	9:45:58 9:46:28					198	10:10:58	1.56611			
149	9:46:58		1557.066 1576.693			199	10:11:28	1.57444			
,	0.40.00		1010.093	, 10a.	•	200	10:11:58	1.58278	1804.847	7 94.4	1

2006 BHP Data WDW-138

Appendix B

Company:	URS Corp	oration			Gauge Manufacturer: Spartek Systems			Survey Da	ate(s)	March 13	2006
Well:	WDW-138				Gauge Serial No.: 76390			Burvey De	no (3).	Intaroll 15	,2000
Field:	Swan Lake		ity Tevas		Calibration Date: 11/25/05						
Record #	T					<u></u>					
Kecora #	Actual	Elapsed	BHP	BHT	Comments	Record #	Actual	Elapsed	BHP	BHT	
	Time	Time	(PSIG)	<u>(°F)</u>			Time	Time	(PSIG)	(°F)	
1	8:37:00	0	3.114		Zero Time Reading	51	8:57:28	0.34111	75.082	72.9	
2 3	8:37:05	0.00139	2.673	73.3		52	8:57:58	0.34944	75,232	72.8	
4	8:37:10 8:37:15	0.00278	2.716	73.4		53	8:58:28	0.35778	75.603		Wellhead Pressure
5	8:37:20	0.00417 0.00556	2.676	73.4		54	8:58:58	0.36611	84.651	72.6	
6	8:37:25	0.00558	2.676 2.651	73.4 73.4		55	8:59;28	0.37444	98.772	73.0	
7	8:37:30	0.00833	2.606	73.4		56 57	8:59:58	0.38278	120.364	73.1	
8	8:37:35	0.00972	2.610	73.5		57 58	9:00:28	0.39111	147.645	73.0	
9	8:37:40	0.01111	2.609	73.5		59	9:00:58	0.39944 0.40778	174.851	73.2	
10	8:37:45	0.01250	2.609	73.5		60	9:01:28 9:01:58	0.40778	202.418 230.972	73.7 74.3	
11	8:37:50	0.01389	2.609	73.5		61	9:02:28	0.42444	259.076	74.3	
12	8:37:55	0.01528	2.589	73,5		62	9:02:58	0.42444	287.491	75.0	
13	8:38:28	0.02444	2,578	73.5		63	9:03:28	0.43270	315,616	76.5	
14	8:38:58	0.03278	2.585	73,6		64	9:03:58	0.44944	343.860	73.3	
15	8:39:28	0.04111	2.664	73.7		65	9:04:28	0.45778	371.776	78.2	
16	8:39:58	0.04944	2.661	73.8		66	9:04:58	0.46611	400.114	79.0	
- 17	8:40:28	0.05778	2.662	73.9		67	9:05:28	0.47444	427.791	79.7	
18	8:40:58	0.06611	2.663	74.0	1	68	9:05:58	0.48278	455.546	80,6	
19	8:41:28	0.07444	2.710	74.2		69	9:06:28	0.49111	483,300	81,3	
20	8:41:58	0.08278	2.733	74.5		70	9:06:58	0.49944		82,1	
21	8:42:28	0.09111	2.729	74.6		71	9:07:28	0.50778		82.5	
22	8:42:58	0.09944	2.731	74.7		72	9:07:58	0.51611		82,6	
23	8:43:28	0.10778	2.728	74.8		73 74	9:08:28	0.52444	508.637	82.6	
24	8:43:58	0.11611	2.748	74.8		74	9:08:58	0.53278	508,483	82,6	i
25	8:44:28	0.12444	2.779	74.9		75 76 77	9:09:28	0.54111	508.404	82,6	
26 27	8:44:58	0.13278	2.752	75.0		76	9:09:58	0.54944	508.305	82.7	
27	8:45:28 8:45:58	0.14111	2.756	75.0		77	9:10:28	0.55778	508,239	82.7	
29	8:46:28	0.14944 0.15778	2.736	75.0		78	9:10:58	0.56611	508,175		
30	8:46:58	0.15778	2.750 2.735	75.0		79	9:11:28	0.57444	508,133	82.7	
31	8:47:28	0.17444	2.735	75.0 75.1		80	9:11:58	0.58278			
32	8:47:58	0.18278	2.890	75.1		81	9:12:28	0.59111	508.015		End Gradient Stop 1,000' (depth uncorrected)
33	8:48:28	0.19111	87.031	74.2		82	9:12:58	0.59944	528.887	82.5	
34	8:48:58	0.19944	69.127	73.2		83	9:13:28	0.60778			
35	8:49:28	0.20778	67.821	73.1		84 85	9:13:58	0.61611			
36	8:49:58	0.21611	68.666	73.1		86	9:14:28 9:14:58	0.62444 0.63278			
37	8:50:28	0.22444	69.633	73.1		87	9:15:28	0.63278			
38	8:50:58	0.23278		73.1		88	9:15:58	0.64944		86.6	
39	8:51:28	0.24111	70,850	73,2		89	9:16:28	0.65778	744,484	87.4	
40	8:51:58	0.24944	71.276			90	9:16:58	0.66611		88.2	
41	8:52:28	0.25778				91	9:17:28	0.67444			
42	8:52:58	0.26611	71.948			92	9:17:58	0.68278			
43	8:53:28	0,27444	72.236			93	9:18:28	0.69111			
44	8:53:58	0.28278	72.448			94	9:18:58	0.69944			
45	8:54:28	0.29111	72.663	73.3		95	9:19:28	0.70778			
46	8:54:58	0.29944				96	9:19:58	0.71611			
47	8:55:28	0.30778				97	9:20:28	0.72444			
48	8:55:58	0.31611	73.179	73.4	4	98	9:20:58	0.73278			
49 50	8:56:28 8:56:58	0.32444 0.33278			4	99 100	9:21:28	0.74111		92.9	

Appendix B

Company:	URS Corp	oration			Gauge Manu	facturer: Spartek Systems			Survey Da	te(s):	March 13	2006
Well:	WDW-138	3			Gauge Serial				2			,2000
Field:	Swan Lak		ity Texas		Calibration D							
Record #	Actual	Elapsed	BHP	BHT		Comments	Record #	Actual	Elapsed	BHP	BHT	
	Time	Time	(PSIG)	(°F)			Accord //	Time	Time	(PSIG)	(°F)	
301	11:02:28	2.42444	1870.578	85.1		<u> </u>	351	11:27:28	2.84111	1867.629	85.1	
302	11:02:58	2.43278	1870,575	85.1			352	11:27:58	2.84944	1867.667	85.1	
303	11:03:28	2.44111		85.1			353	11:28:28	2.85778	1867.735	85.1	
304	11:03:58	2.44944	1870.567	85.1			354	11:28:58	2.86611	1867.769	85.1	
305	11:04:28	2.45778	1870,567	85.1			355	11:29:28	2.87444		85.1	
306	11:04:58		1870,557		BHP at 4,142		356	11:29:58	2.88278	1867.848	85.1	
307	11:05:28	2.47444		85.1			357	11:30:28	2.89111		85.1	
308	11:05:58	2.48278		85.1			358	11:30:58	2.89944	1867.956	85.1	
309	11:06:28	2.49111		85.1			359	11:31:28	2.90778	1868.003	85.1	
310 311	11:06:58	2.49944		85.1			360	11:31:58	2.91611	1868.048	85.1	
312	11:07:28 11:07:58	2.50778		85.1			361	11:32:28	2.92444	1868.071	85.1	
312	11:08:28	2.51611 2.52444		85.1			362	11:32:58	2.93278	1868.117	85.1	
314	11:08:58	2.53278	1862.734	85.1 85.1			363	11:33:28	2.94111	1868.150	85.1	
315	11:09:28	2.54111		85.1			364	11:33:58	2.94944	1868.183	85.1	
316	11:09:58	2.54944		85.1			365 366	11:34:28 11:34:58	2.95778	1868.213 1868.248	85.1	
317	11:10:28	2.55778		85.1			367	11:34:56	2.96611 2.97444	1868.269	85.1 85.1	
318	11:10:58	2.56611		85.1			368	11:35:58	2.98278		85.1	
319	11:11:28	2.57444	1864,289	85,1			369	11:36:28	2.99111	1856.445		
320	11:11:58	2.58278	1864,529	85.1			370	11:36:58	2.99944		85.1	
321	11:12:28	2.59111	1864.714	85,1			371	11:37:28	3.00778	1859.484	85.1	
322	11:12:58	2.59944	1864.871	85.1	1		372	11:37:58	3.01611		85.1	
323	11:13:28	2.60778		85.1	1		373	11:38:28	3.02444	1860,994	85.1	
324	11:13:58	2.61611		85.1	1		374	11:38:58	3.03278	1861.502		
325	11:14:28	2.62444		85.1			375	11:39:28	3.04111	1861,924		
326	11:14:58	2.63278		85.1			376	11:39:58	3.04944		85.1	
327	11:15:28	2.64111		85.1			377	11:40:28	3.05778		85.1	
328	11:15:58	2.64944	1865.512	85.1			378	11:40:58	3.06611	1862.877	85.1	
329 330	11:16:28	2.65778					379	11:41:28	3.07444			
330	11:16:58 11:17:28	2.66611					380	11:41:58	3.08278			
332	11:17:58	2.67444 2.68278	1865,891 1866,054	85,1			381	11:42:28	3.09111	1863.464	85.1	
333	11:18:28	2.69111		85.1 85.1			382	11:42:58	3.09944	1863.629		
334	11:18:58	2.69944					383	11:43:28	3.10778			
335	11:19:28	2.70778					384 385	11:43:58	3.11611	1863,897 1863,993	85.1	
336	11:19:58	2.71611		85,1			386	11:44:28 11:44:58	3.12444 3.13278	1836,181	85.1 85.5	
337	11:20:28	2.72444					387	11:45:28	3.14111	1800.637	90.2	,)
338	11:20:58	2.73278					388	11:45:58	3.14944			
339	11:21:28	2.74111	1866.818	85.1			389	11:46:28	3.15778	1727.373	107.3	
340	11:21:58	2.74944		85,	1		390	11:46:58	3.16611			
341	11:22:28	2.75778		85.1			391	11:47:28	3.17444			
342	11:22:58	2.76611					392	11:47:58	3.18278			
343	11:23:28						393	11:48:28	3.19111	1566.817		
344	11:23:58	2.78278					394	11:48:58	3.19944			
345	11:24:28	2.79111					395	11:49:28	3.20778	1525,052	109.4	
346	11:24:58						396	11:49:58	3.21611			
347	11:25:28						397	11:50:28	3.22444			
348 349	11:25:58 11:26:28	2.81611					398	11:50:58	3.23278			
349	11:26:28	2.82444 2.83278		85.			399	11:51:28	3.24111			
000	11.20.30	2.032/0	1867.591	85.			400	11:51:58	3.24944	1716.142	106.6	វ

Company: Well:	URS Corp WDW-138				Gauge Manufacturer Gauge Serial No.:	Spartek Systems 76390			Survey Da	te(s):	March 13,	2006
ield:	Swan Lake	e, Texas Ci	ty, Texas		Calibration Date:	11/25/05						
Record #	Actual	Elapsed	BHP	BHT	Com	nents	Record #	Actual	Elapsed	BHP	BHT	
	Tíme	Time	(PSIG)	(°F)		.'		Time	Time	(PSIG)	(°F)	
401	11:52:28	3.25778	1712.277	106.8			451	12:17:28	3.67444	2186.564	103.5	
402	11:52:58	3.26611	1702.000	106.0			452	12:17:58	3.68278		106.4	
403	11:53:28	3.27444	1693,860	105.0			453	12:18:28	3.69111	2158.270	106.9	
404	11:53:58	3.28278	1766.893	104.9			454	12:18:58	3.69944	2144.391	106.8	
405	11:54:28	3.29111	1838.011	106.1			455	12:19:28	3.70778	2130.798	106.6	
406	11:54:58	3.29944	1867.856	109.6			456	12:19:58		2114.933	106.2	
407	11:55:28	3.30778	1860.571	110.2			457	12:20:28	3.72444	2101.820	105.7	
408 409	11:55:58	3.31611	1852.006	108.9			458	12:20:58	3.73278		105.2	
409	11:56:28 11:56:58	3.32444	1842.140	107.3			459	12:21:28	3.74111	2072.985	104.6	
410	11:57:28	3.33278	1832.376	105.8			460	12:21:58	3.74944	2060.781	104.1	
412	11:57:58	3.34111 3.34944	1823.674 1812.756	104.8 104.1			461	12:22:28	3.75778		104.0	
413	11:58:28	3.35778	1803,488	104.1			462	12:22:58	3.76611		104.3	
414	11:58:58	3.36611	1791.877	103.4			463	12:23:28	3.77444		104.8	
415	11:59:28	3.37444	1805.323	102.3			464 465	12:23:58 12:24:28	3.78278 3.79111	2163.480 2188.874	105.2	
416	11:59:58	3.38278	1842.520	102.6			465	12:24:28	3.79944	2214.195	105.5 105.0	
417	12:00:28	3.39111	1879.205	103.2			467	12:25:28	3.80778		94.9	
418	12:00:58	3.39944	1915.665	104.1			468	12:25:58	3.81611		94.9	
419	12:01:28	3.40778	1952.526	105.5			469	12:26:28	3.82444		94.5	
420	12:01:58	3.41611	1988.602				470	12:26:58	3.83278	2204.277	93.4	
421	12:02:28	3.42444	2016.299	109.5			471	12:27:28	3.84111	2191.523	97.3	
422	12:02:58	3.43278	2040,225	110.5			472	12:27:58	3.84944	2178.895	100.4	
423	12:03:28	3.44111	2065,232				473	12:28:28	3.85778	2166.365	100.4	
424	12:03:58	3.44944	2093.176				474	12:28:58	3.86611		103.3	
425	12:04:28	3.45778	2085,685				475	12:29:28	3.87444		103.8	
426	12:04:58	3.46611	2077.424	111.	7		476	12:29:58	3.88278		103.5	
427	12:05:28	3.47444		111.3	3		477	12:30:28	3.89111	2030,593	102.3	
428	12:05:58	3.48278		110.3	7		478	12:30:58	3.89944	1983.198	100.7	
429	12:06:28	3.49111	2053,518	109,9	9		479	12:31:28	3.90778	1929,679	99.0	
430	12:06:58	3.49944		109.0	0		480	12:31:58	3.91611	1880,084	97.4	
431	12:07:28	3.50778	2037,751	108,4			481	12:32:28	3.92444	1854.211	96.1	
432	12:07:58	3.51611	2028.844				482	12:32:58	3.93278	1903.248	95.8	
433	12:08:28	3.52444					483	12:33:28	3.94111	1896.004	96,3	
434	12:08:58	3.53278					484	12:33:58	3.94944	1878.190	96.1	
435	12:09:28	3.54111	1996.166				485	12:34:28	3.95778	1862.691 1868.870	95.6	
436	12:09:58	3.54944	1982.308				486	12:34:58	3.96611	1868.870	95.1	
437 438	12:10:28	3.55778	1973.656				487	12:35:28	3.97444	1917.192	95.5	
438	12:10:58	3.56611					488	12:35:58	3.98278	1964.691	96.4	
439	12:11:28 12:11:58	3.57444	1953,549				489	12:36:28	3.99111	2008.271	97.7	
440	12:11:58	3.58278					490	12:36:58	3.99944	1996.353		
442	12:12:58	3.59111 3.59944	1936.321				491	12:37:28	4.00778		98.3	
443	12:12:38	3.60778	1940.241				492	12:37:58	4.01611	1972.409	97.9	
443	12:13:28	3.61611					493	12:38:28	4.02444			
445	12:13:58	3.62444	2013.445				494	12:38:58	4.03278			
446	12:14:58	3.63278		104. 105.			495	12:39:28	4.04111	1933.062	96.5	
447	12:15:28	3.64111		105.			496	12:39:58	4.04944			
448	12:15:58	3.64944					497 498	12:40:28	4.05778			
449	12:16:28	3.65778			7		498 499	12:40:58 12:41:28	4.06611 4.07444			

Well: WDW-138 Gauge Serial No: 7 6390 Field: Swan Lake, Texas City, Texas Calibration Dut: 11/2505 Field: Swan Lake, Texas City, Texas Calibration Dut: 11/2505 Field: Swan Lake, Texas City, Texas Calibration Dut: 11/2505 State 12:4228 Addrift 1887 Comments 1877.6 State 12:4228 44071 1885 1307.98 4511 1207.94 451 1207.94 451 1207.94 4511 1222.926.82 97.6 State 12:4228 44111 127.94 451 1302.98 4531 1302.98 4531 1302.98 4532 State 12:428 12:428 12:428 12:428 12:428 4561 12:228.20 851 State 12:428 12:428 12:428 12:428 12:428 12:428 12:428 12:428 12:428 12:428 12:428 12:428 12:428 12:428 12:428 12:428 12:428 12	Company:	URS Corp	oration			Gauge Manufacturer:	Spartek Systems			Survey Da	te(s);	March 13,	2006
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Well:	WDW-13	8			Gauge Serial No.:	76390			-	.,	,	
Tume Tume Prime Prim Prime Prime Pr	Field:	Swan Lak	e, <u>Texas C</u>	ity, Texas			11/25/05		_				
TuneTuneTuneTuneTuneTune(*F)50112:42:840:93:4203:41:497.256:113:07:2845:107223:7197.550212:42:840:93:4207:586.655:313:02:2845:24225:32:895.350312:42:841:10121:10:7098.655:413:02:2845:27224:0,18893.950612:44:841:1121:51:7110:1055:513:02:2845:1112:28:895.350612:45:841:44441:09.855:613:02:2845:6713:05:845:6713:05:845:6750712:46:2841:444120:13:7799.855:013:15:6845:6713:05:845:67	Record #	Actual	Elapsed	BHP	BHT	Comm	ents	Record #	Actual	Elapsed	BHP	BHT	
501 12-22.8 4.0911 198.500 95.5 551 1307.88 4.50778 222.7173 99.5 502 12-42.8 4.0071 207.500 98.6 553 1307.88 4.50778 223.928 95.3 504 12-42.8 4.1077 207.500 98.6 554 130.828 4.5247 223.928 95.3 505 12-42.8 4.1077 207.500 98.6 554 130.828 4.5277 223.928 95.3 506 12-42.8 4.1077 205.500 95.6 130.828 4.5277 220.828 95.5 507 12-42.8 4.107.7 208.600 555 131.028 4.5611 128.288 98.2 500 12-47.53 4.101.77 98.8 96.0 551 131.128 4.5677 220.828 98.2 511 12-47.28 4.101.77 98.8 98.5 553 131.128 4.5677 127.84 98.2 511 12-48.28 4.191.1 208.53.8 98.0 553 131.128 4.5677 127.84 98.4 512 12-47.58 4.191.402.0 98.1 553 131.128 4.5677 127.84 98.4		Time	Time	(PSIG)	(°F)								
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538 13:00:58 4.39944 2176.070 98.8 588 13:25:58 4.80176 2205.702 97.3 539 13:01:26 4.40778 2211.962 99.2 589 13:26:28 4.82444 2239.191 97.2 540 13:01:58 4.41611 2247.670 100.3 590 13:26:58 4.83278 2241.689 97.1 541 13:02:28 4.42444 2257.32 95.1 591 13:27:28 4.84111 2246.019 97.0 542 13:02:28 4.42444 2257.32 95.1 591 13:27:28 4.84111 2246.002 96.9 543 13:03:28 4.44111 2235.094 93.8 593 13:28:28 4.85778 2247.953 96.8 544 13:03:58 4.46014 2222.019 97.9 595 13:29:28 4.86611 2246.54 96.7 545 13:04:58 4.46011 202.019 98.5 596 13:29:28 4.87444 2251.034 96.5 546 13:04:58 4.46011 202.019 98.7 <	537								13.24:30	4./9944	2230.077	97.5	
539 13:01:28 4.40778 2211.962 99.2 589 13:26:28 4.82444 2239.191 97.2 540 13:01:58 4.41611 2247.670 100.3 590 13:26:58 4.8278 2241.689 97.1 541 13:02:28 4.42444 2257.23 95.1 591 13:27:28 4.84111 2246.019 97.0 542 13:02:58 4.43278 2245.849 94.2 592 13:27:58 4.84944 2246.002 96.9 543 13:03:28 4.44111 2235.094 93.8 593 13:28:28 4.84778 2247.953 96.8 544 13:03:58 4.44944 2224.171 96.3 594 13:28:28 4.86611 2249.654 96.7 545 13:04:58 4.46011 2020.019 98.5 595 13:29:28 4.87444 2251.034 96.5 547 13:05:28 4.47444 2191.021 98.7 597 13:30:28 4.88278 2525.443 96.5 547 13:05:28 4.47444 2191.021 98.7			4,39944	2176.070							2233,702	9/,4	
540 13:01:58 4.41611 2247.670 100.3 590 13:26:58 4.83278 2241.683 97.1 541 13:02:28 4.4244 2257.232 95.1 591 13:27:28 4.84111 2240.019 97.0 542 13:02:58 4.43248 2245.849 94.2 592 13:27:58 4.84944 2246.002 96.9 543 13:03:28 4.44111 2235.094 93.8 593 13:28:28 4.85778 2247.953 96.8 544 13:03:58 4.46944 2224.171 96.3 594 13:28:28 4.86611 2249.654 96.7 545 13:04:28 4.46778 2212.979 97.9 595 13:29:28 4.87444 226.1034 96.6 546 13:04:58 4.46611 202.019 98.7 596 13:29:28 4.87444 2251.034 96.5 547 13:05:28 4.47444 2191.021 98.7 597 13:30:28 4.88278 2252.443 96.5	539		4.40778	2211.962						4.01011	2230.001	97.3	
541 13:02:28 4.4244 2257.232 95.1 591 13:27:28 4.84111 2244.019 97.0 542 13:02:58 4.43278 2245.849 94.2 592 13:27:28 4.84111 2244.019 97.0 543 13:03:28 4.44111 2235.094 93.8 593 13:28:28 4.85778 2247.953 96.8 544 13:03:58 4.44944 2224.171 96.3 594 13:28:58 4.86611 2249.654 96.7 545 13:04:28 4.45778 2212.979 97.9 595 13:29:58 4.86211 2249.654 96.7 546 13:04:58 4.46611 2202.019 98.5 595 13:29:58 4.87444 2251.034 96.5 547 13:05:28 4.47444 2191.021 98.7 597 13:30:28 4.89111 2253.668 96.5 547 13:05:28 4.47444 2191.021 98.7 597 13:30:28 4.89111 2253.668 96.5	540		4.41611	2247.670						4.02444			
542 13:02:58 4.43278 2245.849 94.2 592 13:27:58 4.64944 2246.002 96.9 543 13:03:28 4.44111 2235.094 93.8 593 13:28:28 4.85778 2247.953 96.9 544 13:03:58 4.44944 2224.171 96.3 594 13:28:58 4.86611 2249.654 96.7 545 13:04:28 4.46611 2202.019 97.9 595 13:29:28 4.87444 2251.034 96.5 546 13:04:58 4.46611 2202.019 98.5 596 13:29:28 4.88278 252,243 96.5 547 13:05:28 4.47444 2191.021 98.7 597 13:30:28 4.89111 2253.668 96.5	541	13:02:28	4.42444								2244 010	, 97.1) 07.0	
543 13:03:28 4.44111 2235.094 93.8 593 13:28:28 4.85778 2247.953 96.8 544 13:03:58 4.44944 2224.171 96.3 594 13:28:58 4.86611 2249.654 96.7 545 13:04:28 4.45778 2212.979 97.9 595 13:29:28 4.87444 2251.034 96.6 546 13:04:58 4.46611 2202.019 98.5 596 13:29:28 4.87444 2251.034 96.5 547 13:05:28 4.47444 2191.021 98.7 597 13:30:28 4.88218 2522.443 96.5	542	13:02:58	4.43278	2245.849					13:27:58		2246.002	0.16 9	
544 13:03:58 4.44944 2224:171 96.3 594 13:28:58 4.86611 2249.654 96.7 545 13:04:58 4.46778 2212.979 97.9 595 13:29:28 4.87444 2251.034 96.6 546 13:04:58 4.46611 2020.019 98.5 596 13:29:58 4.88278 2252.443 96.5 547 13:05:28 4.47444 2191.021 98.7 597 13:30:28 4.88111 2253.668 96.5		13:03:28	4.44111	2235.094					13:28:28				
545 13:04:28 4.45778 2212.979 97.9 595 13:29:28 4.87444 2251.034 96.6 546 13:04:58 4.46611 2202.019 98.5 596 13:29:58 4.88278 2252.443 96.5 547 13:05:28 4.47444 2191.021 98.7 597 13:30:28 4.89111 2253.668 96.5			4.44944	2224.171	96.3	3			13:28:58				
546 13:04:58 4.46611 2202.019 98.5 596 13:29:58 4.88278 2252.443 96.5 547 13:05:28 4.47444 2191.021 98.7 597 13:30:28 4.89111 2253.668 96.5					97.9	9							
547 13/05/28 4.4/444 2191.021 98.7 597 13:30:28 4.89111 2253.668 96.5										4.88278	2252,443	96.5	
								597	13:30:28		2253,668	3 96.5	
030 10.00.00 4.03344 2200.000 90.4	548	13:05:58						598	13:30:58	4.89944	2255.035	5 96.4	1
549 13:06:58 4.49111 2210.528 98.8 599 13:31:28 4.90778 2256.076 96.4 550 13:06:58 4.49944 2221.751 98.9 600 13:31:58 4.04614 2257.153													
550 13:06:58 4.49944 2221.751 98.9 600 13:31:58 4.91611 2257.153 96.4	000	12:00:58	4.49944	2223.751	98.	5		600	13:31:58	4.91611	2257.153	3 96.4	4

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Appendix B

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Company:	URS Corp	oration			Gauge Manufacturer	Snartek Systems			Survey Da	te(s).	March 13,	2006
Well:	WDW-13				Gauge Serial No.:	76390			Survey Da	(3).	March 15,	2000
Field:	Swan Lak		ity. Texas		Calibration Date:	11/25/05						
Record #	Actual	Elapsed	BHP	BHT	Com		Record #	Actual	Elapsed	BHP	BHT	
	Time	Time	(PSIG)	(°F)			necolu "	Time	Time	(PSIG)	(°F)	
601	13:32:28	4.92444	2258.848	96.4			651	13:57:28	5.34111	2333,807	90.8	
602	13:32:58	4.93278	2260.387	96.3			652	13:57:58	5.34944	2336.238	90.8 90.7	
603	13:33:28	4.94111		96.3			653	13:58:28	5.35778	2338.512	90.5	
604	13:33:58	4,94944		96.2			654	13:58:58	5.36611		90.4	
605	13:34:28	4.95778		96.0			655	13:59:28	5.37444		90.3	
606	13:34:58	4.96611	2264.611	95.9			656	13:59:58	5.38278	2381.757	91.4	
607	13:35:28	4.97444	2265.405	95.7			657	14:00:28	5.39111	2401.041	93.3	
608	13:35:58	4.98278	2266.305	95.6			658	14:00:58	5,39944		93.4	
609	13:36:28	4.99111	2267.153	95.4			659	14:01:28	5.40778	2405.535	93.6	
610	13:36:58	4.99944	2268.047	95.3			660	14:01:58	5.41611	2404.642	93.8	
611	13:37:28	5.00778	2268.749	95.1			661	14:02:28	5.42444	2390.499	93.9	
612	13:37:58	5.01611	2269.497	94.9			662	14:02:58	5,43278		93.7	
613	13:38:28	5.02444	2270.216	94.8			663	14:03:28	5.44111			
614	13:38:58		2270.827	94.6			664	14:03:58	5.44944			
615	13:39:28		2271.375	94.5			665	14:04:28	5.45778		93.6	
616	13:39:58		2271.933	94.4			666	14:04:58	5,46611			
617	13:40:28		2272.557	94.2			667	14:05:28	5,47444		91.2	
618	13:40:58		2273.152	94.1			668	14:05:58	5,48278		90.4	
619	13:41:28	5.07444	2273.796	94.0			669	14:06:28	5.49111		89.9	
620	13:41:58	5.08278	2274.546	93.9			670	14:06:58	5 49944	2171,388	89.6	
621	13:42:28	5.09111	2275.148	93.7			671	14:07:28		2148.200		
622	13:42:58		2275.662	93.6			672	14:07:58	5,51611		89.1	
623	13:43:28	5.10778	2276.293	93.5			673	14:08:28		2103,275	88.9	
624	13:43:58		2276.977				674	14:08:58	5.53278			
625	13:44:28	5.12444	2277.619	93.3			675	14:09:28	5.54111			
626	13:44:58	5.13278	2278.230	93.2			676	14:09:58	5,54944	2038,463		
627	13:45:28	5.14111	2278.933	93.1			677	14:10:28	5.55778		90.3	
628	13:45:58	5.14944	2279.742	93.0			678	14:10:58	5.56611			
629	13:46:28	5.15778	2280.572	93.0			679	14:11:28	5.57444		89.2	
630	13:46:58	5.16611	2281.383	92.9			680	14:11:58	5.58278			
631	13:47:28	5.17444	2282.178				681	14:12:28	5,59111			
632	13:47:58	5.18278					682	14:12:58		1918.802		
633	13:48:28	5.19111	2283.505	92.6	6		683	14:13:28	5,60778			
634	13:48:58		2284.155				684	14:13:58	5.61611			
635	13:49:28						685	14:14:28	5.62444			
636	13:49:58	5.21611					686	14:14:58	5.63278			
637	13:50:28						687	14:15:28		1827.709		
638	13:50:58						688	14:15:58		1810.354		
639	13:51:28	5.24111					689	14:16:28		1793,420		
640	13:51:58	5.24944					690	14:16:58		1776.723		
641	13:52:28						691	14:17:28	5.67444			
642	13:52:58						692	14:17:58		1743.489		
643	13:53:28		2306.026				693	14:18:28	5.69111			
644	13:53:58					- *	694	14:18:58		1710.984	90.5	
645	13:54:28		2314.787	91.9			695	14:19:28		1694.948		
646	13:54:58		2318.932				696	14:19:58	5 71611	1679.015	5 90.4 5 90.4	
647	13:55:28		2322.371				697	14:20:28		1697.541		
648	13:55:58						698	14:20:58		1719.107		
649	13:56:28						699	14:21:28		1740,769		
650	13:56:58		2331.184				700	14:21:58		1762.200		
					-		,	17.21.00	0.14044	1102.200	, JI.	

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	URS Corp				Gauge Manufacture				Survey Da	te(s):	March 13,	2006	
Well:	WDW-13	-			Gauge Serial No.:	76390							
Field:		e, Texas Ci	ity, Texas		Calibration Date:	11/25/05	·						
Record #	Actual	Elapsed	BHP	BHT	Com	ments	Record #	Actual	Elapsed	BHP	BHT		
L	Time	Time	(PSIG)	(°F)				Time	Time	(PSIG)	(°F)		
701	14:22:28	5.75778	1783.877	88.8			751	14:47:28	6.17444	3.551	76.4		
702	14:22:58	5.76611	1805.819	88.1			752	14:47:58	6,18278	2.931	76.6		
703	14:23:28	5.77444	1827.767	88.3			753	14:48:28	6.19111	2.952	76.6		
704 705	14:23:58	5.78278	1849.598	88.7			754	14:48:58	6.19944	2.927	76.6		
705	14:24:28 14:24:58		1871.273	89.5	1		755	14:49:28	6.20778	2.916	76.7		
707	14:24:56		1892.539 1906.694	92.2			756	14:49:58	6.21611	2.900	76.7		
708	14:25:58		1903.924	90.8 90.4			757	14:50:28	6.22444	2.733	76.7		
709	14:26:28		1901.261	90.4			758 759	14:50:58	6.23278	2.719	76.6		
710	14:26:58		1898.715	90.3			760	14:51:28 14:51:58	6.24111 6.24944	2.704 2.692	76.5 76.4		
711	14:27:28		1896.249	90.2			761	14:52:28	6.25778	2.688	76.4		
712	14:27:58	5.84944	1893.899	90.2			762	14:52:58	6,26611	2.592	75.7		
713	14:28:28		1891.654	90.2			763	14:53:28	6.27444	2.527	75.2		
714	14:28:58		1864.728	90.3			764	14:53:58	6,28278	2.539	75.1		
715	14:29:28		1830.166	92.6			765	14:54:28	6.29111	2.551	74.9		
716	14:29:58		1790.965	91.1			766	14:54:58	6,29944	2.571	74.9		
717	14:30:28		1744.898	90.0			767	14:55:28	6,30778	2.601	75.0		
718	14:30:58		1697.512	89.2			768	14:55: 5 8	6.31611	2.614	75.1		
719 720	14:31:28 14:31:58		1649.850	91.7			769	14:56:28	6,32444	2.628	75.3		
720	14:31:58		1601.695	91.9			770	14:56:58	6.33278	2.613	75.4		
722	14:32:58		1553.584 1505.401	91.3 90.5			771	14:57:28	6.34111	2.623	75.5		
723	14:33:28		1456.808	89.7			772	14:57:58	6,34944	2.633	75.6		
724	14:33:58		1408.392	89.0			773 774	14:58:28 14:58:58	6.35778 6.36611	2.642 2.666	75.7 75.8		
725	14:34:28		1359.864	88.3			775	14:59:28	6.37444	2.665	75.8		
726	14:34:58		1320.444	87.5			776	14:59:58	6.38278	2,669	76.0		
727	14:35:28		1274.840	86.8			777	15:00:28	6,39111	2.692	76.2		
728	14:35:58		1213.411	86.1			778	15:00;58	6.39944	2.700	76.4		
729	14:36:28		1152.534	85.2			779	15:01:28	6.40778	2.715	76.6		
730	14:36:58		1086.209	84.3			780	15:01:58	6.41611	2.732	76.7		
731	14:37:28		1019.025	83.4			781	15:02:28	6.42444	2.758	76.9		
732 733	14:37:58		977.807	82.8			782	15:02:58	6.43278	2,750	77.0		
734	14:38:28 14:38:58		904.372 830.864				783	15:03:28	6.44111	2.763	77.2		
735	14:39:28		757.222				784	15:03:58	6,44944	2.780	77.3		
736	14:39:58		683.253				785	15:04:28	6.45778	2.799	77.4		
737	14:40:28		608.759				786 787	15:04:58 15:05:28	6.46611 6.47444	2.797	77.6 77.7		
738	14:40:58		533.692				788	15:05:58	6.48278	2.815 2.808	77.8		
739	14:41:28		458.264				789	15:06:28	6.49111	2.821	77.9		
740	14:41:58	6.08278	383.612				790	15:06:58	6,49944		78.1		
741	14:42:28		307.412				791	15:07:28	6.50778		78.1		
742	14:42:58		230,771				792	15:07:58	6.51611	2.819	78.2		
743	14:43:28		167.071				793	15:08:28	6.52444	2.845	78.2		
744 745	14:43:58		149.816				794	15:08:58	6.53278	2,853	78.4		
745	14:44:28 14:44:58						795	15:09:28	6.54111	2.857	78.5		
740	14:44:56		132.897 125.584	75.1			796	15:09:58	6.54944		78.7		
748	14:45:58		125.094				797	15:10:28	6.55778		78.9		
749	14:46:28	6.15778	123.761				798 799	15:10:58 15:11:28	6.56611		79.1		
750	14:46:58						800	15:11:58	6.57444 6.58278				
					-		000	10,11,00	0.00270	∠,300	19.1		

Company:	URS Corp	ooration			Gauge Manufacture	r: Spartek Systems			Survey D	ate(s):	March 13	. 2006
Well:	WDW-13	8			Gauge Serial No.:	76390						,
Field:	Swan Lak	e, Texas C	ity, Texas		Calibration Date:	11/25/05						
Record #	Actual	Elapsed	BHP	BHT		iments	Record #	Actual	Elapsed	BHP	BHT	<u> </u>
	Time	Time	(PSIG)	(°F)	cou	interna interna	Accord #	Time	Time	(PSIG)	(°F)	
801	15:12:28	6.59111	2.971	79.8	·		851			1 (1 510)		
802	15:12:58	6.59944	3.004	80.0			851 852 853					
803 804	15:13:28 15:13:58	6.60778	3.040	80.3			853					
805	15:13:58	6.61611 6.62444	3.043 3.039	80.5 80.7			854 855					
806	15:14:58	6.63278	3.083	81.1			856					
807	15:15:28		3.135	81.8			857					
808							857 858					
809							859					
810 811							860					
812							861					
813							862 863					
814							864					
815 816							864 865					
817							866					
818							867 868					
819							868 869					
820 821							870					
822							871					
823							872 873					
824							874					
825							875					
826 827							876		· .			
828							877 878					
829							879					
830							880					
831 832							881					
833							882 883					
834							884					
835							885					
836 837							886					
837							887 888					
839							889					
840							890					
841							891					
842 843							892					
844							893 894					
845							895					
846							896					
847 848							897					
849							898 899					
850							900					

APPENDIX C

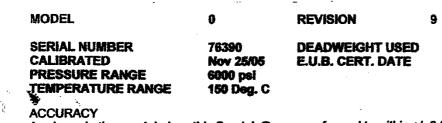
Pressure Gauge Documentation



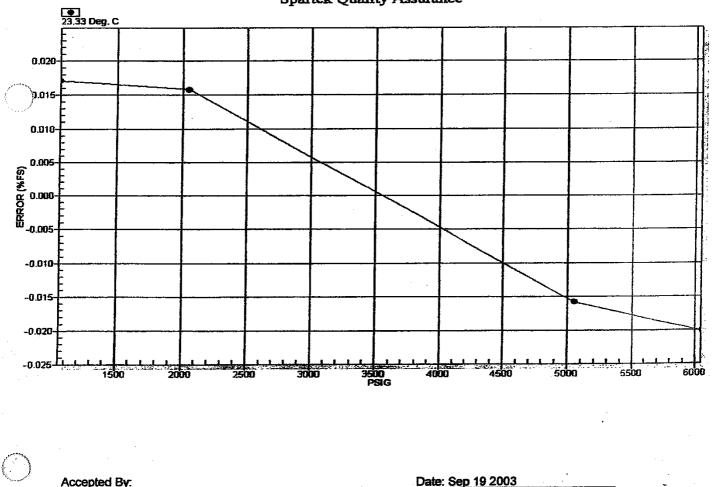
Spartek Systems

#1 Thevenaz Ind. Tr. Sylvan Lake, AB, Ca, T4S 1P5 Phone (403) 887-2443 Fax (403) 887-4050 URL www.sparteksystems.com **Pressure Gauge**

Certificate of Conformance

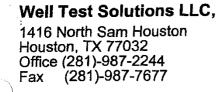


As shown in the graph below, this Spartek Gauge conformed to within +/- 0.025%F.S of the pressure standard used in calibration, which is accurate to within +/- 0.01% of reading. This gives an overall accuracy of +/-(0.025%F.S. + 0.01% of reading)



Spartek Quality Assurance

Sandia Technologies, LLC Well Test Solutions' SDS 3000 Gauge Calibration Sheet



1



4/19/2005 1:52:40 PM EMP0004

Calibration Certificate

Model: SDS3000

Serial#: 6363

Specifications

Calibration Pressure Range: 3,500 PSI

Pressure: Accuracy

(0.8400 PSI (0.024)%FS)

Apr. 12/2005

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Calibration Temperature Range: _40.00 to 60.00 (C)

Temperature: Accuracy

Cal. Date:

Certificate #:

(C) (0.15) %FS)

Calibration Summary

Pressue: Accuracy (Maximum Error)

0.78PSI (0.0223) %FS

Temperature: Accuracy (Maximum Error) (C) 0.15

<u>Traceability Statement</u> All working standards are traceable to national or internationally re

Calibrated with Well Test Solutions DWG # 1: S/N 6465

Calibrated By: Larry Bet



APPENDIX D

Annulus Pressure Test Data -WDW-138

URS

URS Corporation MSC Texas City Site, Well No. 2 (WDW-138) **Annulus Pressure Test**

Gauge: Well Test Solutions, LLC Model: Serial Number: Range: Calibration Date:

SDS 3000 6363 0-3,500 psi 04/12/05

Note: Injection Tubing was static at 70 psig.

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Date	Time	Pressure
Duit	7 mile	(psia)
3/13/2006	8:20:00	1179.21
3/13/2006	8:20:15	1178.99
3/13/2006	8:20:30	1178.82
3/13/2006	8:20:45	1178.61
3/13/2006	8:21:00	1178.41
3/13/2006	8:21:15	1178.27
3/13/2006	8:21:30	1178.13
3/13/2006	8:21:45	1177.97
3/13/2006	8:22:00	1177.86
3/13/2006	8:22:15	1177.62
3/13/2006	8:22:30	1177.43
3/13/2006	8:22:45	1177.30
3/13/2006	8:23:00	1177.13
3/13/2006	8:23:15	1176.99
3/13/2006	8:23:30	1176.82
3/13/2006	8:23:45	1176.73
3/13/2006	8:24:00	1176.56
3/13/2006	8:24:15	1176.39
3/13/2006	8:24:30	1176.25
3/13/2006	8:24:45	1176.16
3/13/2006	8:25:00	1175.99
3/13/2006	8:25:15	1175.89
3/13/2006	8:25:30	1175.73
3/13/2006	8:25:45	1175.56
3/13/2006	8:26:00	1175.45
3/13/2006	8:26:15	1175.34
3/13/2006	8:26:30	1175.19
3/13/2006	8:26:45	1175.06
3/13/2006	8:27:00	1174.93
3/13/2006	8:27:15	1174.82
3/13/2006	8:27:30	1174.71
3/13/2006	8:27:45	1174.57
3/13/2006	8:28:00	1174.40
3/13/2006	8:28:15	1174.31
3/13/2006	8:28:30	1174.15
3/13/2006	8:28:45	1174.03
3/13/2006	8:29:00	1173.93
3/13/2006	8:29:15	1173.82
3/13/2006	8:29:30	1173.69
3/13/2006	8:29:45	1173.61
3/13/2006	8:30:00	1173.54
3/13/2006	8:30:15	1173.42

Date	Time	Pressure
		(psia)
3/13/2006	8:30:30	1173.25
3/13/2006	8:30:45	1173.18
3/13/2006	8:31:00	1173.04
3/13/2006	8:31:15	1173.01
3/13/2006	8:31:30	1172.85
3/13/2006	8:31:45	1172.72
3/13/2006	8:32:00	1172.67
3/13/2006	8:32:15	1172.60
3/13/2006	8:32:30	1172.45
3/13/2006	8:32:45	1172.33
3/13/2006	8:33:00	1172.24
3/13/2006	8:33:15	1172.18
3/13/2006	8:33:30	1172.15
3/13/2006	8:33:45	1171.97
3/13/2006	8:34:00	1171.84
3/13/2006	8:34:15	1171.75
3/13/2006	8:34:30	1171.68
3/13/2006	8:34:45	1171.62
3/13/2006	8:35:00	1171.49
3/13/2006	8:35:15	1171.41
3/13/2006	8:35:30	1171.33
3/13/2006	8:35:45	1171.21
3/13/2006	8:36:00	1171.12
3/13/2006	8:36:15	1171.10
3/13/2006	8:36:30	1170.99
3/13/2006	8:36:45	1170.88
3/13/2006	8:37:00	1170.76
3/13/2006	8:37:15	1170.66
3/13/2006	8:37:30	1170.56
3/13/2006	8:37:45	1170.51
3/13/2006	8:38:00	1170.41
3/13/2006	8:38:15	1170.35
3/13/2006	8:38:30	1170.28
3/13/2006	8:38:45	1170.20
3/13/2006	8:39:00	1170.10
3/13/2006	8:39:15	1170.00
3/13/2006	8:39:30	1169.95
3/13/2006	8:39:45	1169.82
3/13/2006	8:40:00	1169.76
3/13/2006	8:40:15	1169.75
3/13/2006	8:40:30	1169.62
3/13/2006	8:40:45	1169.57

APPENDIX D Page 2 of 4

Time

8:41:00

8:41:15

8:41:30

8:41:45

8:42:00

8:42:15

8:42:30

8:42:45

8:43:00

8:43:15

8:43:30

8:43:45

8:44:00

8:44:15

8:44:30

8:44:45

8:45:00

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8:47:00

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8:48:00

8:48:15

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8:49:00

8:49:15

8:49:30

8:49:45

8:50:00

8:50:15

8:50:30

8:50:45

8:51:00

8:51:15

1167.50

1167.42

URS Corporation MSC Texas City Site, Well No. 2 (WDW-138) **Annulus Pressure Test**

LLC

Note: Injection Tubing was static at 70 psig.

Date

3/13/2006

3/13/2006

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3/13/2006

3/13/2006

3/13/2006

Gauge:	Well Test Solutions,
Model:	SDS 3000
Serial Number:	6363
Range:	0-3,500 psi
Calibration Date:	04/12/05

	r			
Pressure	j	Date	Time	Pressure
(psia)	Ĺ	2/12/2006	L	(psia)
1169.50 1169.35		3/13/2006	8:51:30	1167.39
1169.35		3/13/2006	8:51:45	1167.39
		3/13/2006	8:52:00	1167.28
1169.26		3/13/2006	8:52:15	1167.24
1169.16		3/13/2006	8:52:30	1167.17
1169.09		3/13/2006	8:52:45	1167.04
1169.03		3/13/2006	8:53:00	1167.02
1168.94		3/13/2006	8:53:15	1167.03
1169.53		3/13/2006	8:53:30	1167.02
1168.71		3/13/2006	8:53:45	1166.96
1168.46		3/13/2006	8:54:00	1166.79
1168.64		3/13/2006	8:54:15	1166.78
1168.64		3/13/2006	8:54:30	1166.77
1168.59		3/13/2006	8:54:45	1166.75
1168.60		3/13/2006	8:55:00	1166.69
1168.56		3/13/2006	8:55:15	1166.60
1168.56		3/13/2006	8:55:30	1166.60
1168.52		3/13/2006	8:55:45	1166.59
1168.49		3/13/2006	8:56:00	1166.53
1168.47		3/13/2006	8:56:15	1166.53
1168.42		3/13/2006	8:56:30	1166.45
1168.35		3/13/2006	8:56:45	1166.42
1168.34		3/13/2006	8:57:00	1166.38
1168.28		3/13/2006	8:57:15	1166.33
1168.22		3/13/2006	8:57:30	1166.30
1168.21		3/13/2006	8:57:45	1166.27
1168.21		3/13/2006	8:58:00	1166.22
1168,14		3/13/2006	8:58:15	1166.10
1168.10		3/13/2006	8:58:30	1166.07
1168.00		3/13/2006	8:58:45	1166.04
1168.00		3/13/2006	8:59:00	1166.02
1167.93		3/13/2006	8:59:15	1165.99
1167.85		3/13/2006	8:59:30	1165.93
1167.84		3/13/2006	8:59:45	1165.77
1167.76		3/13/2006	9:00:00	1165.76
1167.74		3/13/2006	9:00:15	1165.75
1167.66		3/13/2006	9:00:30	1165.68
1167.64		3/13/2006	9:00:45	1165.63
1167.56		3/13/2006	9:01:00	1165.58
1167.50		3/13/2006	9:01:15	1165.53
1167.49		3/13/2006	9:01:30	1165.46
1167 42		2/12/2004	0.01.45	1165 45

3/13/2006

9:01:45

1165.45

Start Test

APPENDIX D Page 3 of 4



Time

9:02:00

9:02:15

9:02:30

9:02:45

9:03:00

9:03:15

9:03:30

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9:04:00

9:04:15

9:04:30

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9:10:15

9:10:30

9:10:45

9:11:00

9:11:15

9:11:30

9:11:45

9:12:00

9:12:15

Pressure

(psia)

1165.33

1165.28

1165.19

1165.18

1165.11

1165.03

1164.97

1164.92

1164.82

1164.79

1164.73

1164.65

1164.62

1164.54

1164.55

1164.44

1164.36

1164.35

1164.34

1164.25

1164.21

1164.18 1164.10

1163.98

1163.99

1163.90

1163.91

1163.83

1163.80

1163.77

1163.67

1163.65

1163.56

1163.46

1163.45

1163.41

1163.37

1163.25

1163.23

1163.19

1163.16

1163.03

End Test

URS Corporation MSC Texas City Site, Well No. 2 (WDW-138) **Annulus Pressure Test**

onege.	for rest solutions,	
Model:	SDS 3000	
Serial Number:	6363	
Range:	0-3,500 psi	
Calibration Date:	04/12/05	

3/13/2006

Gauge

Well Test Solutions, LLC

Date Time Pressure (psia) 3/13/2006 9:12:30 1163.03 3/13/2006 9:12:45 1163.00 3/13/2006 9:13:00 1162.88 9:13:15 1162.88 3/13/2006 3/13/2006 9:13:30 1162.88 1162.72 3/13/2006 9:13:45 3/13/2006 9:14:00 1162.66 3/13/2006 9:14:15 1162.62 3/13/2006 9:14:30 1162.60 3/13/2006 9:14:45 1162.50

9:15:00

1162.42

Note: Injection Tubing was static at 70 psig.

Date

3/13/2006

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Page	4	of	4	

APPENDIX E

GCWA Radioactive Tracer Survey Log and Interpretation Letter WDW-138

GULF COAST WELL ANALYSIS

COASTAL WIRELINE SERVICES, INC.

URS – Malone Service Company Waste Disposal Well 138 Swan Lake Facility Texas City, Texas March 13, 2006

RADIOACTIVE TRACER SURVEY

The two phases of this test included; 1) determining the flow through and from the tubing by ejecting a slug of radioactive material (lodine-131 10mci) and monitoring the flow profile as it moves down the tubing and into the formation. 2) Testing the mechanical integrity of the casing, cement, and formation bond by positioning gamma-ray detector slightly above the point where the formation accepts fluid and monitoring the gamma radiation response from an ejected slug of radioactive material. A baseline gamma-ray log was run from 4,265 feet to 3,350 feet (202 feet above top of packer assembly). The injection rate was 42 gpm for the profile runs and 63 gpm time drive surveys.

The first phase of this test incorporates the injection of radioactive slug at 3,350 feet (202 feet above top of packer assembly) and passing the detector through the radioactive material until it passes from the tubing and into the formation. The first slug gave an indication of leaving the packer at 3,552 feet and going into the formation below 4,162 feet. Made five (5) passes and chased slug down to 4,180 feet. This portion of this test was repeated with six (6) passes and slug chased down to 4,183 feet. Profile survey indicates that all fluid is going into injection interval at this time. No indication of any fluid migrating up hole behind pipe above 4,162 feet.

The second phase of this test involved setting lower detector at 4,142 feet (20 feet above top of perfs.) and ejecting a slug of radioactive material at 4,137 feet and recorded on time drive for sixteen (16) minutes with an injection rate of 63 gpm. This portion of this test was repeated at same depth and rate. Time drive survey indicates no fluid migrating up hole behind pipe at this time.

3909 Halik Road - Pearland, Texas 77581 - Office 281-485-6548 Fax 281-485-1954

RADIOACTIVE TRACER SURVEY CONTINUE

A Base after survey gamma ray log was ran from 4,265 feet to 3,350 feet and compared to original base gamma ray log which indicated no residue of radioactive material above 4,162 feet in formation, casing, tubing, or packer.

Radioactive Tracer Survey was conducted by Stoney Johnson (Gulf Coast Well Analysis) and witnessed by Mr. Mike Grant (Sandia Technologies).

Sincerely Stoney Johnson

Engineer G.C.W.A.

(.**.**

Gulf Coast Well Analysis

3909 Halik Road - Pearland, Texas 77581 - Office 281-485-6548 Fax 281-485-1954

2006 ANNUAL MECHANICAL INTEGRITY PROCEDURE FOR WDW-138

URS CORPORATION TEXAS CITY, TEXAS

SANDIA PROJECT No. 839-URS-06

The procedures to complete the 2006 Ambient Monitoring and Mechanical Integrity Testing (MIT) for WDW-138, as prescribed by the United States Environmental Protection Agency (USEPA), Region 6, are detailed below.

NOTIFICATION AND APPROVAL FROM THE TCEQ AND THE USEPA.

<u>STEP</u>

Task

- 1. URS will ensure that the well is placed out of service for a period of 48 hours prior to testing commencement.
- 2. URS will provide adequate access to wellhead.
- **3.** Sandia Technologies, LLC and all third party venders will complete URS orientation requirements prior to initiating on-site activities.

Annulus Pressure Test Procedure

- **NOTE:** The annulus pressure test will be conducted according to TCEQ's "Basic Guidelines for Mechanical Integrity Tests and Related Cased Hole Wireline Logging".
- **4.** A calibrated test gauge or wireline pressure transducer will be installed on the annulus of WDW-138. A certificate of calibration will be provided for the gauge or transducer.
- 5. Utilizing the URS annulus pump, pressurize the 7-inch protection casing by 2-7/8-inch injection tubing annulus minimum of 1,000 psi above the static shut-in surface tubing pressure.
- 6. Monitor and record the annulus pressure of WDW-138 every five minutes for a minimum of thirty minutes. In accordance with the TCEQ guidelines for the APT, the annulus pressure test will be considered acceptable if the pressure loss or gain is less than 5% of the starting test pressure during the 30-minute test period. The test will also be recorded on a computer and pressure data will be supplied on a floppy disk. If the pressure loss or buildup is greater than 5% of the initial test pressure, the annulus pressure test will be repeated. The results of the annulus pressure test will be reported to the URS project manager.
- 7. Bleed down annulus pressure to normal operating range and remove surface pressure transducer from the annulus. Connect the monitoring system to the wells annulus and return the annulus pressure system to normal operating conditions.

2006 MIT Procedure

Move-In and Rig Up Logging Unit On WDW-138

- 8. Move in and rig up a wireline logging unit, mast unit, and wireline lubricator with grease injector pressure control equipment. Logging unit must provide a line washer for pressure testing of lubricator and rinsing of electric-line, pump-in tee, and wing valve suitable for pump truck operations.
- **9.** Following the successful completion of the Annulus Pressure Test, pick up a calibrated memory (battery operated) recording pressure probe and Radioactive Tracer Survey (RTS) tool string. The RTS tool string should consist of a bow spring centralizer, dual gamma ray detectors (upper and lower detectors), a collar locator, and a radioactive tracer ejector and will be configured to TCEQ guidelines.

Pressure Survey

- **10.** Position the memory pressure gauge at or near the top of the wellhead. Collect 10 minutes of static wellhead pressure and temperature data (10-second data).
- **11.** Continue in the wellbore in 1,000 feet increments taking pressure gradient stops, collecting 10 minutes of pressure data.
- **12.** Correlate depth at the production packer of 3,552 feet to 3,560 feet, according to the Gulf Coast Well Analysis Radioactive Tracer Survey (RTS) dated March 16, 2005. Note depth correction. Continue with gradient stop at 4,000 feet.
- **13.** Position pressure gauge at 4,142 feet (20-feet above the upper most perforation). Allow pressure gauge to stabilize at depth for a minimum of 1 hour.

Radioactive Tracer Survey

- 14. Move-in and rig up a fluid pump truck and a 130-barrel vacuum truck (fluid transport). Vacuum truck should be loaded with fresh water. Add liquid potassium chloride (KCl) substitute until obtaining a 3-percent equivalent KCl mixture. Attach vacuum truck to the low-pressure filter unit equipped with 5-micron filters. Attach a fluid discharge hose from filter unit to the fluid holding tank of the fluid pump truck. Attach a high-pressure fluid discharge hose to the wireline lubricator pump-in sub.
- **15.** Following the completion of the Static Pressure Survey, run an RTS as follows:
 - a. Run gamma ray/casing collar locator (GR/CCL) initial base log from approximately 4,271 feet measured depth (<u>tagged fill during 2005 RTS</u>) to 3,350 feet (202 feet above log-indicated top of packer). Tie in depths with the Gulf Coast Well Analysis RAT log dated March 16, 2005. Note that reference KB elevation is 8.0 feet above the lowermost wellhead flange.
 - b. Position RTS lower detector at 4,142 feet (or 20 feet above top of perforations). Run log in statistical time drive for five minutes.

- c. Position RTS lower detector at 3,830 feet (or 10 feet above log-indicated abandoned top of packer). Run log in statistical time drive for five minutes.
- d. Establish a constant injection rate of approximately 42 gallons per minute with the fluid pump truck.
- e. Pick up RTS tool to 3,350 feet and eject a slug of Iodine-131. Verify ejection of isotope by monitoring the time it takes for the isotope to pass from ejector to lower detector.
- f. Profile the movement of the isotope in the wellbore with over lapping logging passes until isotope enters the disposal interval or moves below the top of the fill at approximately 4,271 feet.
- g. Repeat steps **e** and **f** for second slug chase survey.
- h. Position RTS tool lower detector at 4,122 feet (40 feet above top of active perforations). Increase injection rate to approximately 60 gallons per minute.
- i. Eject a slug of Iodine-131. Verify ejection of isotope by monitoring the time it takes for the isotope to pass from ejector to lower detector.
- j. Hold RTS tool stationary with lower detector at 4,240 feet while logging in statistical time drive for 15 minutes.
- k. Repeat step **i** and step **j** for the second time-drive survey.
- 1. Cease injection, rig down, and release the fluid pump truck and vacuum truck. Run final GR/CCL log from tagged fill at approximately 4,271 feet to 3,350 feet. Compare final log to initial base log.
- m. Unload RTS tool and pull out of hole with RTS tools and pressure gauge.
- **16.** Collect pressure data from memory pressure gauge. Rig down and release the wireline logging unit.

Prepare Report

17. Prepare the Mechanical Integrity and Bottomhole Pressure Falloff Test report in accordance with TCEQ and USEPA guidelines. URS will submit the final report to the TCEQ and USEPA within the thirty calendar days allowed for submittal to the TCEQ and USEPA following the completion of the field activities.

- 3 -