

REPORT

C-44 Reservoir and Stormwater Treatment Area Groundwater Monitoring Project Replacement Monitor Wells Report

USACE Contract No.:
W912EP-10-D-0010

April 2015



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Section 1

Introduction

CDM Federal Programs Corporation (CDM Smith) is under contract with the U. S. Army Corps of Engineers (USACE) to implement a groundwater monitor program during performance of Construction Contract 1 at C-44 Reservoir and Stormwater Treatment Area (C-44 RSTA). Groundwater levels and limited groundwater quality data shall be acquired to evaluate changes that may occur during construction. Objectives of the project are: 1) to enable rapid implementation of a groundwater monitor program at existing wells at critical locations; 2) expand the groundwater monitor program to existing wells farther away from the Contract 1 construction footprint, in preparation for later construction; and 3) construct new monitor wells (and well clusters) to replace previously plugged and abandoned wells. Phase I of the project was completed by CDM Smith in 2012 and included Wellhead Rehabilitation, resurvey, instrument installation, groundwater level data compilation, water quality sampling, and reporting. Phase II included the construction of new monitor wells to replace those destroyed during construction at the C-44 site, instrument deployment, groundwater level data compilation, water quality sampling and reporting. This report compliments the *C-44 Reservoir and Stormwater Treatment Area Groundwater Monitoring Project Well Rehabilitation Report* (CDM Smith 2012) and documents the replacement well installation, survey, and water quality data sampling results that were completed as part of Phase II of this task order.

The C-44 project site is located just east of Indiantown, FL. All site work and drilling occurred within the limits of the project site depicted in **Figure 1-1** below.

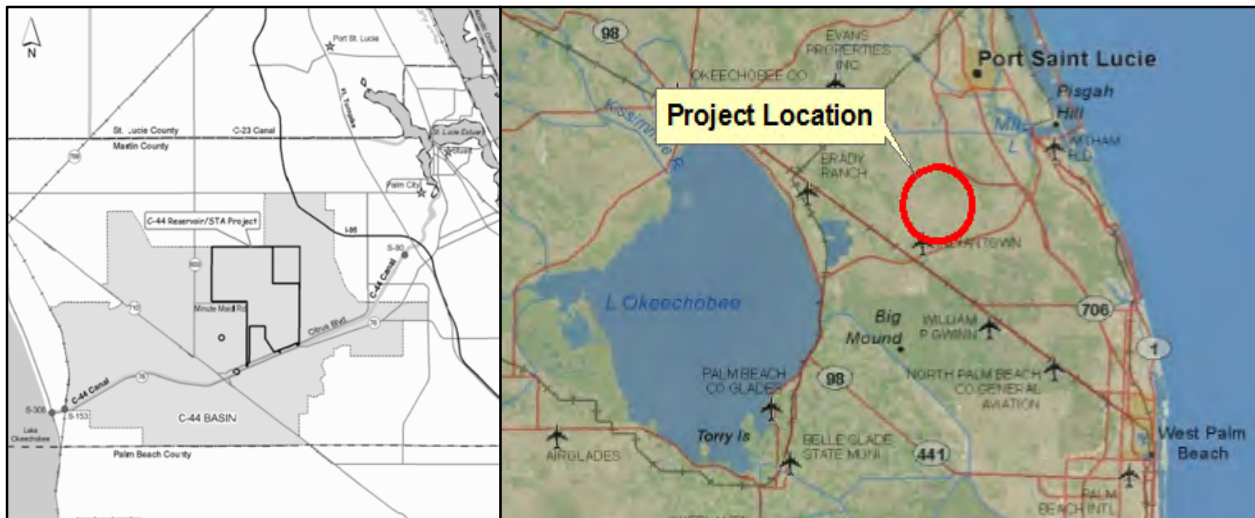


Figure 1-1
C-44 Reservoir and Stormwater Treatment Area (STA) Project Location Map

Section 2

Replacement Monitor Well Installation

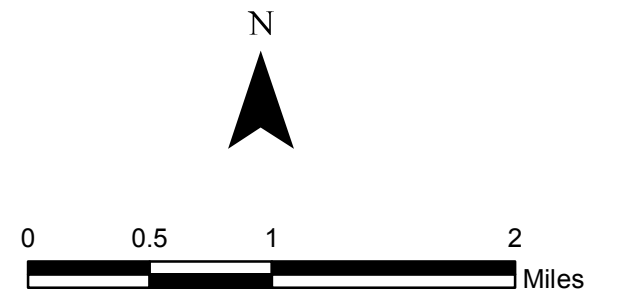
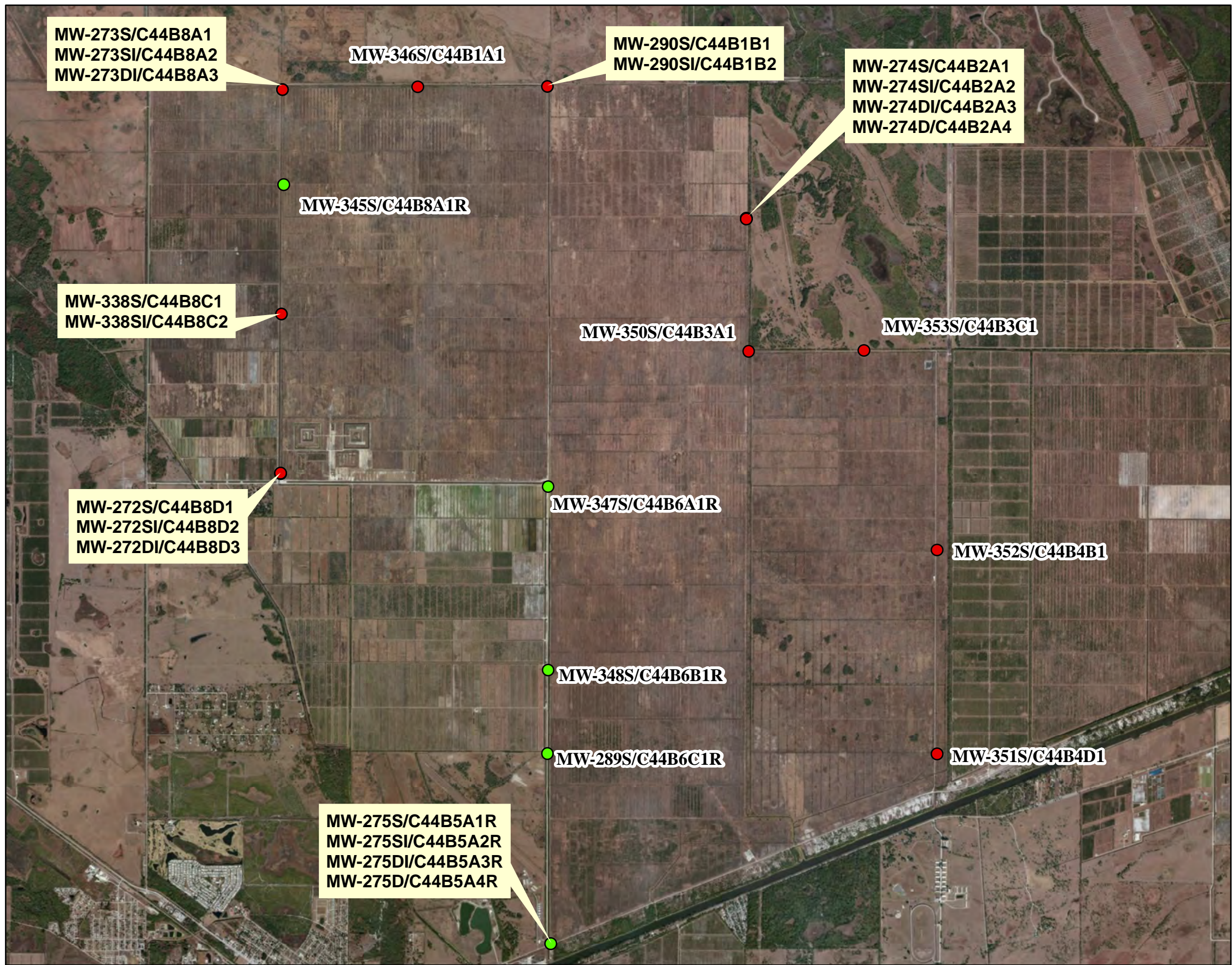
CDM Smith contracted and supervised the installation of eight replacement monitor wells. The replacement wells were installed by Amrill, Inc., from February 16th to 25th, 2015. The replacement monitor well locations are shown on **Figure 2-1**.

2.1 Monitor Well Construction

The replacement monitor wells were constructed to be consistent with ASTM 5092 (2010). Wells were drilled with mud rotary technique. Monitor well construction details are presented on **Table 2-1** and shown on **Figure 2-2** through **Figure 2-6**. Well casings are four inch inner diameter (ID) Schedule (SCH) 80 Polyvinyl chloride (PVC) with threaded flush joints plus a three foot riser extending above the pad. Well screens are four inch diameter, 10 feet (ft) long SCH 80 PVC with threaded flush joints and 0.010 inch slotted screen. The base of the screen has a six inch end cap. The filter pack consists of 20/40 graded silica sand and extends from the base of the borehole to an elevation one foot above the top of screen. The filter pack is sealed using 0.5 inch bentonite pellets to an elevation one foot above the top of the filter pack. The remaining annulus is backfilled to the pad level using a mixture of grout (Type I/II Portland Cement) and bentonite. After installation, the monitor wells were developed and surged with a submersible pump for at least one hour or until turbidity was less than 20 Nephelometric Turbidity Unit (NTUs) and conductivity, pH, and temperature were stabilized. Conduit (0.75 inch ID) was placed from the top of the monitor well casing, through and beneath the concrete pad and terminating approximately three feet beyond the pad. This conduit was installed on the side of the pad that is opposite of the closest road and marked with surveyor paint on the pad. The 12 inch diameter SCH 80 PVC outer protective casing is four feet above land surface and has a Royer cap with keyed dolphin locks securing the lid. The bollards are installed approximately one foot from the corners of the pad, filled with grout, and painted yellow. Initially, the bollards were installed between 1 to 1.5 feet below land surface. Amrill mobilized to the site on March 24, 2015 to re-install the protective bollards to a depth of two feet below land surface. Additional concrete was added around to bollards to better secure them in place. Photographs of the monitor wells are provided in **Appendix A**.

Table 2-1 Monitor Well Depths and Locations

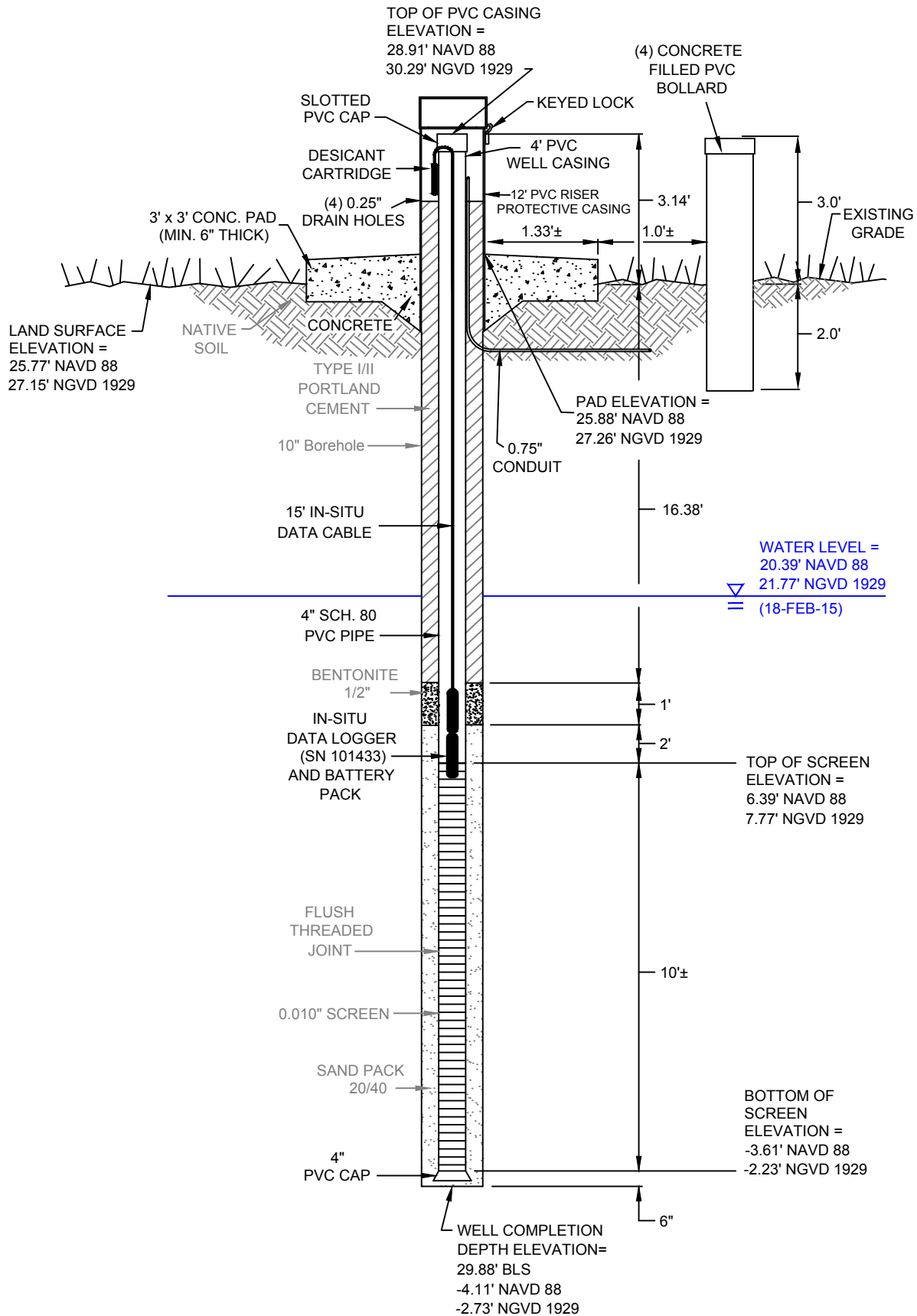
DBHYDRO Well ID	Old Well ID	Date Installed	Screen Interval	Total Depth (ft btoc)	Water Level 2/25/15 (ft btoc)	Latitude (Dec. Degrees)	Longitude (Dec. Degrees)	Cardinal Direction of Conduit
C44B8B1R	MW-345S	2/18/2015	20 - 30	33.0	8.52	27.1074	-80.4653	South
C44B6A1R	MW-347S	2/17/2015	20 - 30	32.1	16.90	27.0743	-80.4331	East
C44B6B1R	MW-348S	2/17/2015	20 - 30	32.7	16.58	27.0541	-80.4333	East
C44B6C1R	MW-289S	2/17/2015	20 - 30	33.1	18.21	27.0453	-80.4333	East
C44B5A1R	MW-275S	2/23/2015	20 - 30	32.9	19.16	27.0247	-80.4328	North
C44B5A2R	MW-275SI	2/24/2015	40 - 50	52.9	18.30	27.0247	-80.4327	North
C44B5A3R	MW-275DI	2/23/2015	60 - 70	72.8	18.24	27.0248	-80.4327	North
C44B5A4R	MW-275D	2/19/2015	90 - 100	103.0	18.10	27.0248	-80.4327	North



Legend

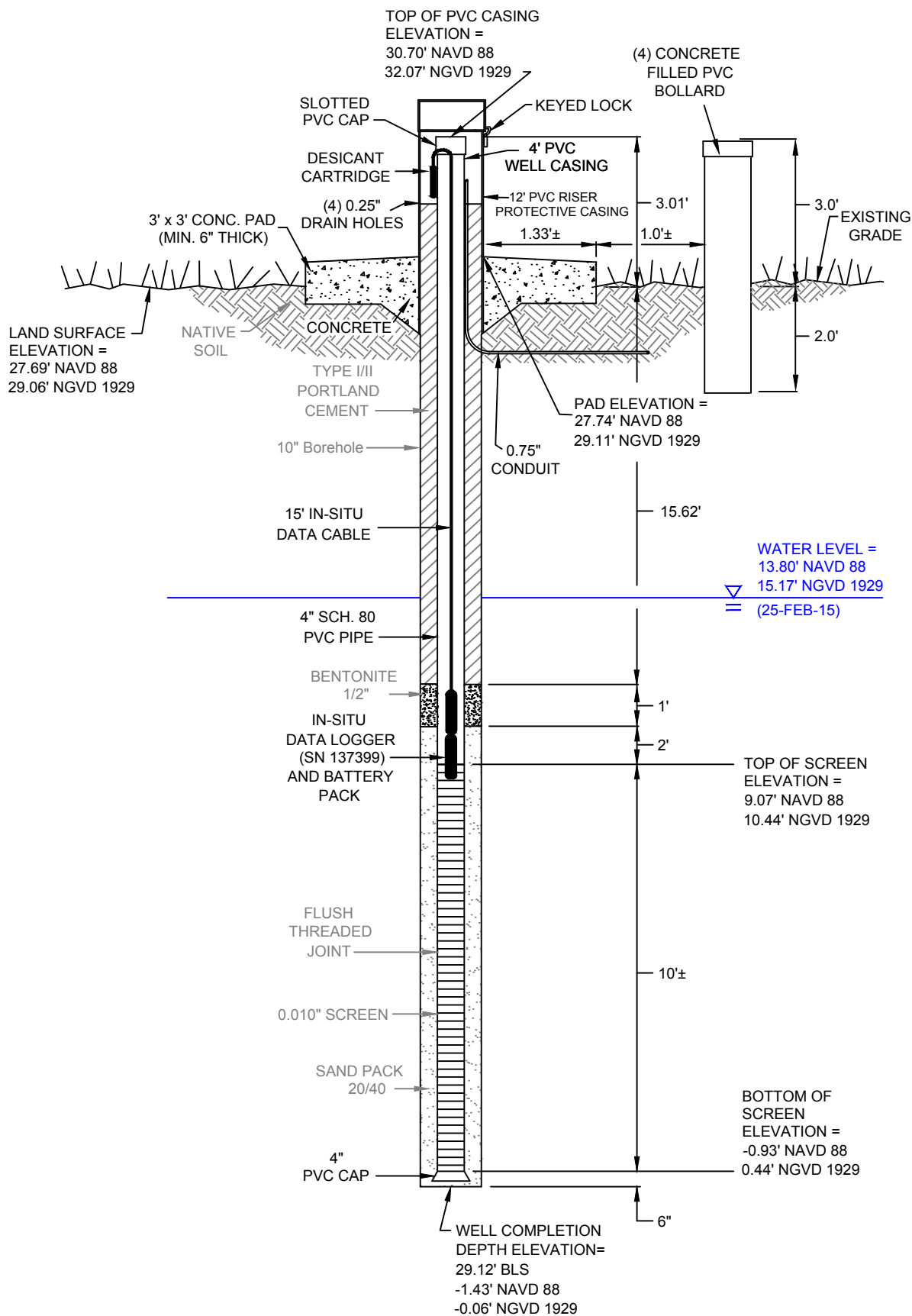
- Existing Wells
- Replacement Wells

Note: Old well name listed first followed by DBHYDRO name



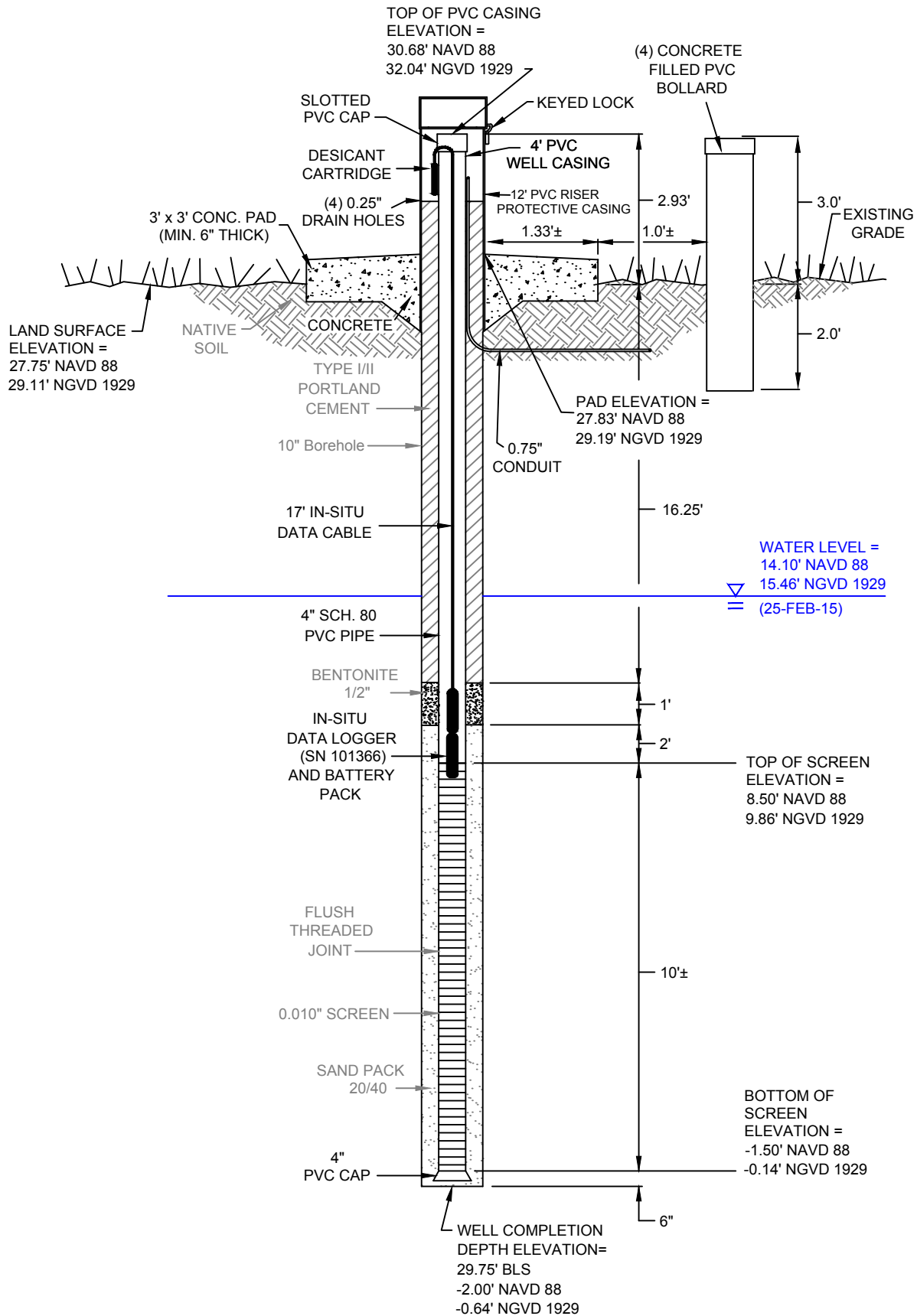
NOT TO SCALE

INSTALLED 18-FEB-15 BY AMDRILL



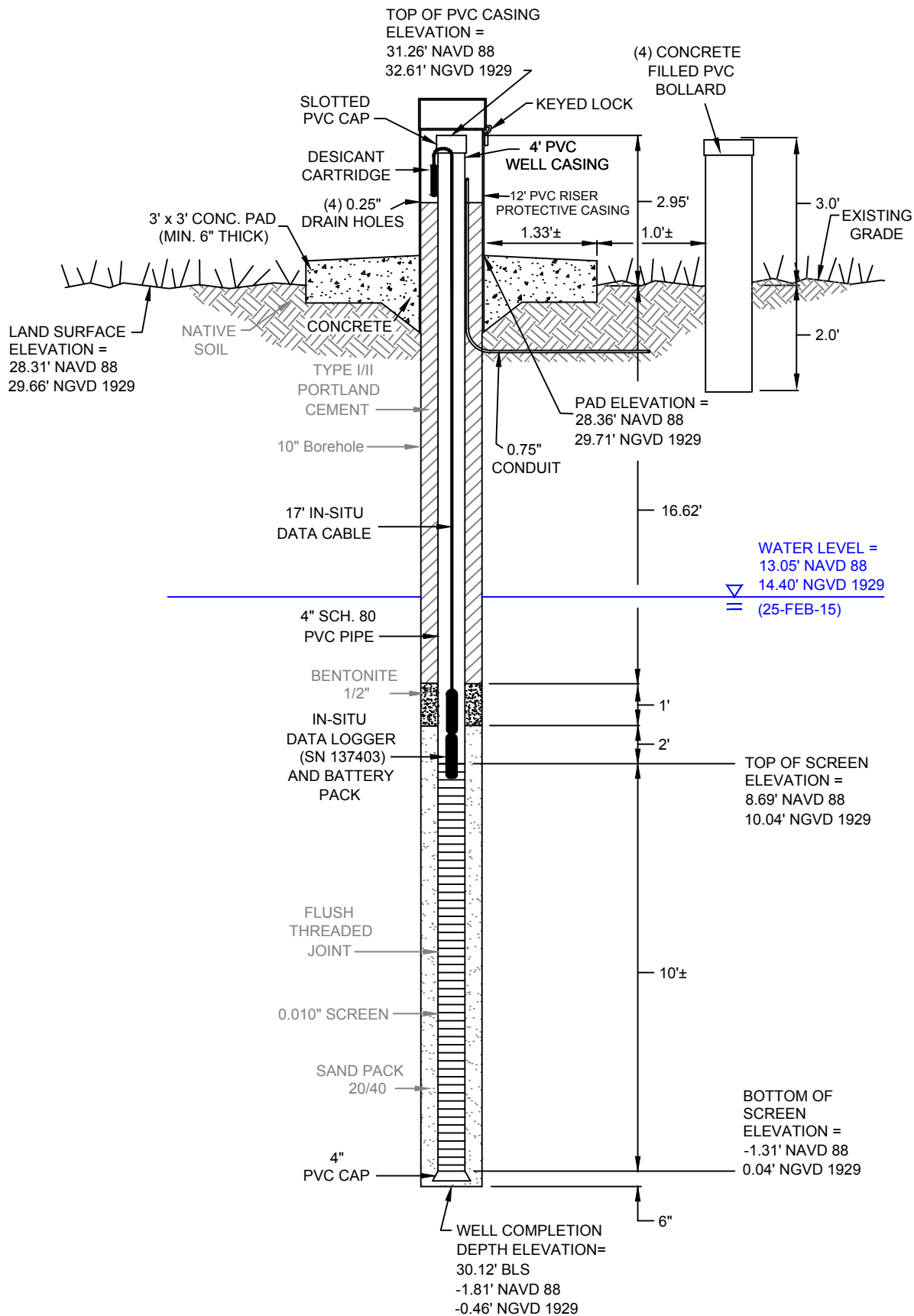
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INSTALLED 17-FEB-15 BY AMDRILL



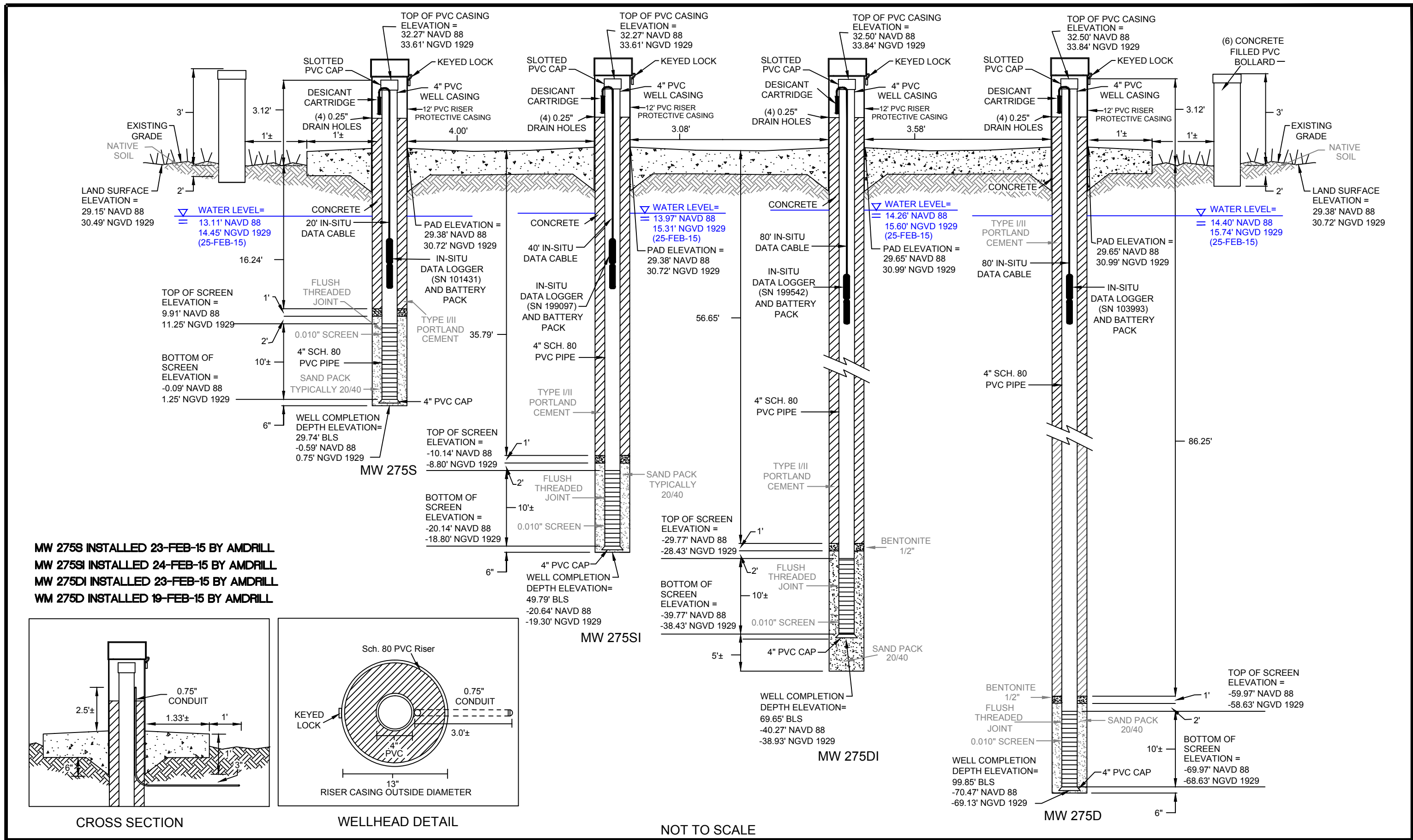
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INSTALLED 17-FEB-15 BY AMDRILL



2.2 Survey

After the replacement well installation was complete, CDM Smith subcontracted Betsy Lindsay, Inc to survey the 8 replacement well locations, land surface, pad and top of PVC casing elevations. Survey elevations for top of PVC casing were shot from the north side of the casing and marked on each well. The survey was completed in accordance with EM 1110-1-1005 and met minimum accuracies of 1 foot for the horizontal position and 0.01 foot for the vertical elevations. Elevations were reported in both NGVD1929 and NAVD88 datums. Certified Wellhead Survey sheets are provided in **Appendix B**. Survey results are also summarized in **Table 2-2** below and included on the well construction Figures 2-2 through 2-6.

Table 2-2 Survey Data Summary

DBHYDRO Well ID	Old Well ID	TOC (PVC) Elevation		Pad Elevation		Land Surface Elevation	
		Feet NGVD 1929	Feet NAVD 88	Feet NGVD 1929	Feet NAVD 88	Feet NGVD 1929	Feet NAVD 88
C44B8B1R	MW-345S	30.29	28.91	27.26	25.88	27.15	25.77
C44B6A1R	MW-347S	32.07	30.70	29.11	27.74	29.06	27.69
C44B6B1R	MW-348S	32.04	30.68	29.19	27.83	29.11	27.75
C44B6C1R	MW-289S	32.61	31.26	29.71	28.36	29.66	28.31
C44B5A1R	MW-275S	33.61	32.27	30.72	29.38	30.49	29.15
C44B5A2R	MW-275SI	33.61	32.27	30.72	29.38	30.49	29.15
C44B5A3R	MW-275DI	33.84	32.50	30.99	29.65	30.72	29.38
C44B5A4R	MW-275D	33.84	32.50	30.99	29.65	30.72	29.38

2.3 Instrument Installation

CDM Smith instrumented each replacement well with existing project equipment including a Level Troll 500 data logger, external battery pack, data cable, and desiccant cartridge on March 3, 2015. At two monitor wells (C44B6A1R and C44B6C1R), the available data cables were of insufficient length to deploy the Level Troll below the current water level. Two additional monitor wells (C44B6B1R and C44B5A1R) had cables that were less than one foot below the water level. CDM Smith contacted the USACE to inform them about the need to replace the shorter cable lengths. Longer replacement cables will be acquired and deployed in a separate contract for these four monitor wells. The serial numbers of the equipment, cable lengths, and battery power at the time of deployment for each replacement well are presented in **Table 2-3**.

Table 2-3 Equipment Deployed and Battery Status

DBHYDRO Well ID	Old Well ID	Level Troll 500 Serial Number	Data Cable Serial Number	Data Cable Length (ft)	Water Level 3/24/15 (ft btoc)	Battery Power Percentage
C44B8B1R	MW-345S	101433	200769	15	8.95	40
C44B6A1R*	MW-347S	137399	200770	15	16.97	67
C44B6B1R†	MW-348S	101366	203734	17	16.65	40
C44B6C1R*	MW-289S	137403	204081	17	18.33	67
C44B5A1R†	MW-275S	101431	236699	20	18.98	40
C44B5A2R	MW-275SI	199097	200758	40	18.36	80
C44B5A3R	MW-275DI	199542	200801	80	18.29	83
C44B5A4R	MW-275D	103993	200799	80	18.14	39

*Monitor well with a cable length that did not extend below the water level in the well.

†Monitor well with a cable length that extends to less than one foot below the water level in the well.

Section 3

Water Quality

On March 3, 2015, CDM Smith sampled each replacement monitor well for baseline water quality characteristics. Samples were collected in accordance with standard FDEP groundwater sampling operating procedures and analyzed using USEPAs analytical methods. Groundwater samples were analyzed for field parameters (pH, dissolved oxygen (DO), specific conductance, temperature, turbidity, oxidation reduction potential (ORP)), and major dissolved constituents (Calcium, Magnesium, Sodium, Sulfate, Chloride, Iron, Total Alkalinity), and selected nutrients (Total Phosphorus, Nitrate, Nitrite). QA/QC procedures followed the Quality Assurance Systems Requirements of the Everglades Restoration Program. Copies of the groundwater sampling logs and calibration sheets are provided in **Appendix C. Table 3-1** summarizes the field parameters measured during the sampling event.

Groundwater samples were delivered directly to the subcontracted laboratory, ALS Environmental in Jacksonville, FL. A copy of the laboratory report and Automated Data Processing Tool (ADaPT) files are also included in Appendix C and the results are summarized in **Table 3-2**. Groundwater sampled from monitor well C44B6B1R exceeded the Groundwater Cleanup Target Level (GCTL) for iron (GCTL of 0.3 mg/L, Chapter 62-777 Florida Administrative Code). Groundwater concentrations also exceeded the GCTL for sodium in groundwater sampled from monitor well C44B8B1R and C44B5A3R. There were no other GCTL exceedances associated with groundwater sampled from the monitor wells.

Table 3-1 Water Quality – Field Parameters

DBHYDRO Well ID	Old Well ID	Static WL (Feet BTOC PVC)	pH (SU)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	Temperature (°C)	Turbidity (NTU)	ORP (mV)
C44B8B1R	MW-345S	8.61	7.18	0.68	1,510	23.60	3.92	124.1
C44B6A1R	MW-347S	16.86	7.52	0.44	1,027	24.80	7.93	79.1
C44B6B1R	MW-348S	16.15	7.06	0.32	1,084	24.50	8.18	33.4
C44B6C1R	MW-289S	17.88	7.21	0.25	1,157	25.50	5.46	18.7
C44B5A1R	MW-275S	18.61	7.40	0.38	961	25.90	3.60	25.3
C44B5A2R	MW-275SI	17.98	7.70	1.33 [†]	766	26.30	8.57	18.7
C44B5A3R	MW-275DI	17.92	9.35 [†]	3.39 [†]	618	26.30	4.69	13.5
C44B5A4R	MW-275D	17.81	7.97	5.10 [†]	807	25.90	2.11	26.8

[†]Dissolved oxygen readings may have been elevated to malfunctioning probe.

†Slightly elevated pH may be a result of cement grout influence from well construction.

Table 3-2 Water Quality – Laboratory Analysis

DBHYDRO Name	Old Well ID	Total Alkalinity as CaCO ₃ (mg/L)	Calcium (mg/L)	Chloride (mg/L)	Iron (mg/L)	Magnesium (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)	Sodium (mg/L)	Sulfate (mg/L)	Total Phosphorus (mg/L)
C44B8B1R	MW-345S	362	113	141	0.040 I	21.9	0.08 I	0.10 I	204	218	0.061
C44B6A1R	MW-347S	266	73.7	97.9	0.070 I	10.7	0.03 U	0.02 U	137	125	0.158
C44B6B1R	MW-348S	326	94	80.5	0.590	11.1	0.12 I	0.02 U	137	124	0.027
C44B6C1R	MW-289S	302	89.9	146	0.030 I	11.3	0.03 U	0.02 U	145	64	0.0769
C44B5A1R	MW-275S	268	69.8	43.4	0.010 I	7.25	0.16 I	0.11 I	146	158	0.12
C44B5A2R	MW-275SI	185	56.9	72.6	0.009 I	8.88	0.35	0.15 I	94.9	84.7	0.138
C44B5A3R	MW-275DI	114	19.1	69.6	0.010 I	1.74	0.14 I	0.73	189	186	0.13
C44B5A4R	MW-275D	254	98.9	84.8	0.005 I	12.3	0.27	0.02 U	56.3	51.5	0.0211

Notes: U - Indicates that the compound was analyzed but not detected.

I - The reported value is between the laboratory method detection limit and the practical quantitation limit

Appendix A

Photographic Log

C-44 Replacement Wells



Photo 1: C44B8B1R (MW-345S)



Photo 2: C44B6A1R (MW-347S)



Photo 3: C44B6B1R (MW-348S)



Photo 4: C44B6C1R (MW-289S)



Photo 5: C44B5A1R to A4R (MW-275S, SI, DI, D)

Appendix B

Certified Wellhead Survey

SITE CONTROL SUPPLIED BY SFWMD **GCY Inc.**

NORTH	EAST	ELEV	DESC
1012572	830036.6	27.741	1283-21A
1012581	835391.5	27.975	1283-21B
1012590	840647.8	29.325	1283-21C
1007313	840704.4	27.424	1283-21D
1007294	844892.7	25.653	1283-22A
1007281	848495.5	28.554	1283-22B
1001921	848633	28.989	1283-22C
1001986	853871.7	25.058	1283-22D
1002001	856492.8	25.67	1283-22E
996667.9	856487.2	26.061	1283-23A
991354.4	856467.7	26.283	1283-23B
986044.4	856433.3	29.764	1283-23C
984446.7	856497.4	37.268	1283-23D
984508.3	855950.7	30.793	1283-23E
983578.1	853349.9	29.885	1283-24A
982302	850395.5	30.869	1283-24B
981308	847710.6	30.196	1283-24C
980079.9	844746.9	28.454	1283-24D
979202.7	842459.9	31.591	1283-24E
978411.6	840605.8	26.792	1283-25A
980821.2	840550.7	26.629	1283-25B
986215.5	840551	27.754	1283-25C
991652.7	840575.8	28.239	1283-25D
996650.9	835253	24.622	1283-26b
996683.9	829864.3	26.474	1283-26c
996715.9	824639.4	38.011	1283-26d
1002218	829989	28.02	1283-29A
1007596	830022.3	27.661	1283-29B

C44B5A1R, C44B5A2R, C44B5A3R & C44B5A4R Wells

C44B6C1R Well

C44B8B1R Well

SURVEYOR'S NOTES

- BEARINGS AS SHOWN HEREON ARE BASED ON STATE PLANE COORDINATES, NORTH AMERICAN DATUM OF 1983 (N.A.D. 83), FLORIDA EAST ZONE, REFERENCE A BEARING OF N89°49'35"E ALONG THE NORTH LINE OF SECTION 6, TOWNSHIP 39 SOUTH, RANGE 39 EAST, MARTIN COUNTY FLORIDA.
- ELEVATIONS AS SHOWN HEREON REFERENCE THE NATIONAL GEODETIC VERTICAL DATUM OF 1988 (NAVD 88) REFERENCE BENCH MARK INFORMATION SUPPLIED BY SFWMD. THE ELEVATIONS FOR THE SFWMD CONTROL POINTS ARE BASED ON A CLOSED LEVEL LOOP BASED ON MONUMENTS R543, J543 AND H516. THE LEVEL LOOP WAS ADJUSTED WITH STAR*NET-PLUS Version 6.0.25 Copyright 1988-2002 Starplus Software, Inc. Run Date: Thu Jul 01 2004 09:18:12 AND PASSING THE QUI SQUARE TEST AT THE 95% LEVEL. THE HORIZONTAL LOCATION OF THE SFWMD CONTROL WAS OBTAINED BY GPS WITH RTK AND SHOULD NOT BE CONSIDERED HORIZONTAL CONTROL.
- THE BENCH MARKS USED TO SUPPORT EACH WELL SURVEY IS LISTED WITH WELL. THE ELEVATION OF EACH WELL IS BASED ON A CLOSED LEVEL LOOP.
- THIS SURVEY IS NOT VALID WITHOUT THE SIGNATURE AND ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR.
- THIS SURVEY WAS DONE IN THE FIELD UTILIZING GLOBAL POSITIONING SYSTEM (G.P.S.) WITH REAL TIME KINEMATIC (R.T.K.) ALL DISTANCES GIVEN ARE GRID DISTANCES. THE ELEVATION x THE SCALE FACTOR = COMBINED FACTOR 0.99998963.
- THIS IS NOT A BOUNDARY SURVEY.
- THIS SURVEY WAS PERFORMED TO SHOW THE ELEVATIONS RELATED THE MONITORING WELLS AS SHOWN. THE ELEVATIONS ON THE TOP OF PVC WELL WERE TAKEN ON THE NORTH RIM OF THE PVC. THE ELEVATIONS ON THE CONCRETE SLABS WERE TAKEN ON THE SOUTHEAST SIDE OF THE METAL CASING (SEE TYPICAL MONITORING WELL DETAIL, SHEET 2 OF 2).

EXISTING WELL SURVEY DATA

POINT No.	NORTHING	EASTING	LATITUDE	LONGITUDE	NAME OF WELL	TOP OF PVC (NAVD 88 EL)	TOP OF CONC SLAB (NAVD 88 EL)	NATURAL GROUND (NAVD 88 EL)	TOP OF PVC (NGVD 29 EL)	TOP OF CONC SLAB (NGVD 29 EL)	NATURAL GROUND (NGVD 29 EL)
5167	978584.543	840849.39	27.0248	-80.4327	C44B5A4R	32.50	29.65	29.38	33.84	30.99	30.72
5168	978583.751	840844.41	27.0248	-80.4327	C44B5A3R	32.50	29.65	29.38	33.84	30.99	30.72
5169	978583.381	840840.41	27.0247	-80.4327	C44B5A2R	32.27	29.38	29.15	33.614	30.72	30.49
5170	978582.975	840835.81	27.0247	-80.4328	C44B5A1R	32.27	29.38	29.15	33.614	30.72	30.49
5171	986047.521	840614.86	27.0453	-80.4333	C44B6C1R	31.26	28.36	28.31	32.6149	29.71	29.66
5172	989239.008	840622.46	27.0541	-80.4333	C44B6B1R	30.68	27.83	27.75	32.039	29.19	29.11
5173	996587.774	840650.08	27.0743	-80.4331	C44B6A1R	30.70	27.74	27.69	32.0704	29.11	29.06
5174	1008574.211	830127.25	27.1074	-80.4653	C44B8B1R	28.91	25.88	25.77	30.2866	27.26	27.15

ABBREVIATIONS

BM	BENCHMARK
CONC	CONCRETE
EL	ELEVATION
MW	MONITORING WELL
NAVD	NORTH AMERICAN VERTICAL DATUM
NGVD	NATIONAL GEODETIC VERTICAL DATUM
NO.	NUMBER
P.L.S.	PROFESSIONAL LAND SURVEYOR
PVC	POLY VINYL CHLORIDE

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE "SPECIFIC PURPOSE SURVEY" AS SHOWN HEREON IS A TRUE AND CORRECT REPRESENTATION OF A FIELD SURVEY MADE UNDER MY DIRECTION AND CHARGE FROM APRIL 15, 2015 THROUGH APRIL 20, 2015 AND SAID "SPECIFIC PURPOSE SURVEY" IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF. IT IS FURTHER CERTIFIED THAT THIS "SPECIFIC PURPOSE SURVEY" COMPLIES WITH THE MINIMUM TECHNICAL STANDARDS FOR "SPECIFIC PURPOSE SURVEY" SET FORTH BY THE FLORIDA BOARD OF PROFESSIONAL SURVEYORS AND MAPPERS IN CHAPTER 5J-17, FLORIDA ADMINISTRATIVE CODE, PURSUANT TO SECTION 472.027, FLORIDA STATUTES.

BETSY LINDSAY, INC.
SURVEYING AND MAPPING

ELIZABETH A. LINDSAY, P.L.S.
FLORIDA REGISTRATION NO. 4724

NOT VALID WITHOUT THE SIGNATURE
AND ORIGINAL RAISED SEAL OF A
FLORIDA LICENSED SURVEYOR AND MAPPER

B BETSY LINDSAY, INC.
SURVEYING AND MAPPING
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LICENSED BUSINESS NO. 6852

DATE	REVISIONS

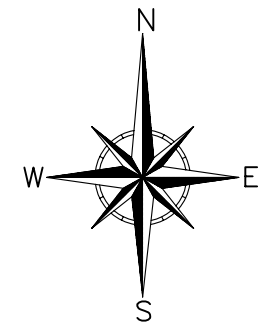
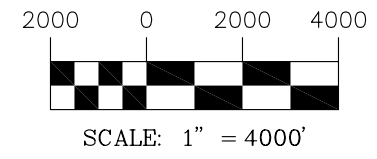
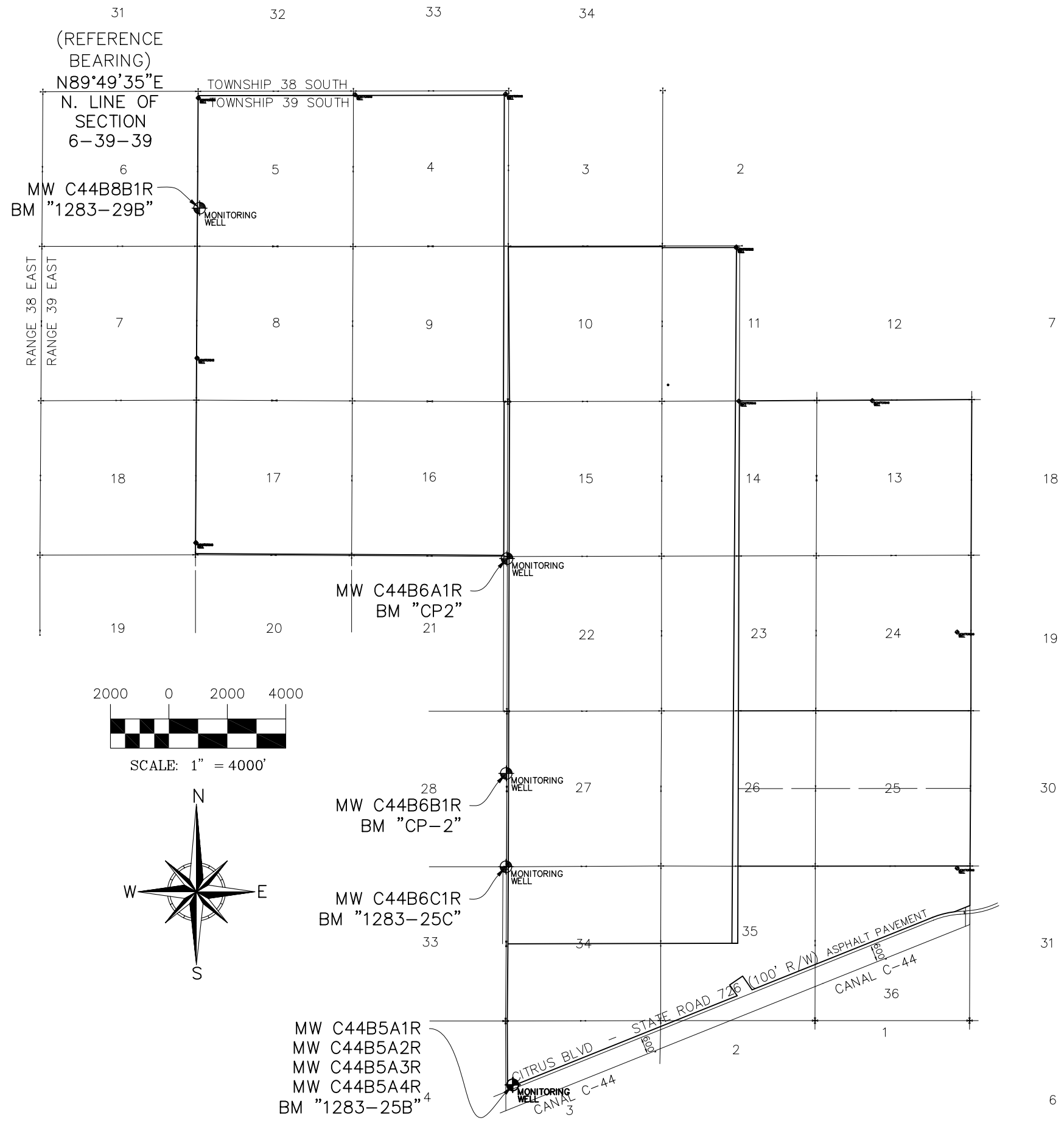
DATE 04/20/2015
SCALE AS SHOWN
FIELD BK. C 44
DRAWN BY C.R.
CHECKED BY E.A.L.

**C-44 RESERVOIR & STORMWATER TREATMENT AREA
MARTIN COUNTY, FLORIDA**

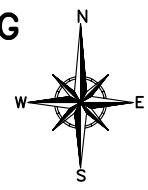
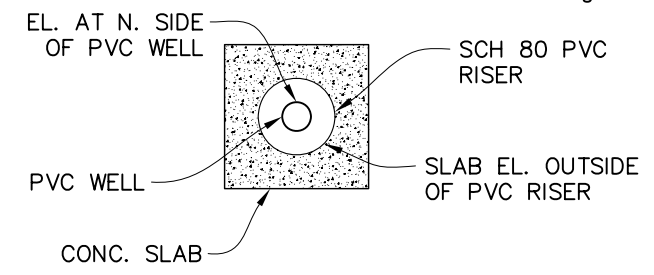
SPECIFIC PURPOSE SURVEY
CDM SMITH

SHEET NO. 1
OF 2 SHEETS
PROJECT NO.
11-93

S:\11 PROJECTS\11-93-c-44wells\dwg\SPS-WELLS 4-20-15.dwg, Layout2, 4/22/2015 3:36:03 PM, 1:1, C.J.R.



TYPICAL MONITORING WELL DETAIL
(NOT TO SCALE)



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(772)286-5753 (772)286-5933 FAX
LICENSED BUSINESS NO. 6852

DATE	REVISIONS

DATE 04/20/2015
SCALE AS SHOWN
FIELD BK. C-44
DRAWN BY C.R.
CHECKED BY E.A.L.

C-44 RESERVOIR & STORMWATER TREATMENT AREA
MARTIN COUNTY, FLORIDA

SPECIFIC PURPOSE SURVEY
CDM SMITH

SHEET NO. 2
OF 2 SHEETS
PROJECT NO. 11-93

Appendix C

Groundwater Sampling Logs, Calibration Sheets,
ADaPT Data (CD only), Laboratory Report

**Form FD 9000-24
GROUNDWATER SAMPLING LOG**

SITE NAME: CR-44	SITE LOCATION: Indiantown, Martin County, FL
WELL NO: C44B8B1R (MW345S)	SAMPLE ID: C44B8B1R (MW345S)
DATE: 3/3/13-15	

PURGING DATA

WELL PVC DIAMETER (inches): 4.0	TUBING DIAMETER (inches):	WELL SCREEN INTERVAL DEPTH: feet to 22 feet 33	STATIC DEPTH TO WATER (feet): 8.61	PURGE PUMP TYPE OR BAILER: PP
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable)				
= (feet - feet) X gallons/foot = gallons				
EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME (only fill out if applicable)				
By FS 2212 = - gallons + (10014 gallons/foot X 45 feet) + .07 gallons = .14 gallons				
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 24	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 24	PURGING INITIATED AT: 900	PURGING ENDED AT: 914	TOTAL VOLUME PURGED (gallons): 1.1

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR (describe)	ORP (mV)
904	.6	.6	0.15	8.73							
908	.2	.8	0.05	8.73	7.16	23.6	1512	0.67	3.96	clear	130.2
911	.15	.95	0.05	8.73	7.16	23.6	1511	0.69	3.67	"	125.4
914	.15	1.1	0.05	8.73	7.18	23.6	1510	0.68	3.92	"	124.1

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
 TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: CDM Smith Gordon Brown Andrew Kyan		SAMPLER(S) SIGNATURE(S): <i>[Signature]</i>		SAMPLING INITIATED AT: 915	SAMPLING ENDED AT: 923
PUMP OR TUBING DEPTH IN WELL (feet): 24		TUBING MATERIAL CODE: PE		FIELD-FILTERED: <input checked="" type="checkbox"/> N	FILTER SIZE: 0.45 µm
FIELD DECONTAMINATION: PUMP <input checked="" type="checkbox"/> TUBING <input checked="" type="checkbox"/> (replaced)		DUPLICATE: <input checked="" type="checkbox"/>			

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
same	1	PE	500 mL	None			Anions, Alk, <input checked="" type="checkbox"/>	APP	0.05
as above	1	PE	250 mL	Nitric Acid			Metals	APP	
as above	1	PE	125 mL	Sulfuric Acid			Total Phos <input checked="" type="checkbox"/>	APP	

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

- NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
 2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)
 pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

Form FD 9000-24 GROUNDWATER SAMPLING LOG

SITE NAME: CR-44	SITE LOCATION: Indiantown, Martin County, FL
WELL NO: C44B6A1R (MW347S)	SAMPLE ID: C44B6A1R (MW347S)
DATE: 3/3/15	

PURGING DATA

WELL PVC DIAMETER (inches): 4.0	TUBING DIAMETER (inches): 1.25	WELL SCREEN INTERVAL DEPTH: 20 feet to 30 feet	STATIC DEPTH TO WATER (feet): 16.8	PURGE PUMP TYPE OR BAILER: PP
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable)				
= (feet - feet) X gallons/foot = gallons				
EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME (only fill out if applicable)				
154 F92212 = - gallons + (.0014 gallons/foot X 50 feet) + .07 gallons = .14 gallons				
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 24	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 24	PURGING INITIATED AT: 1003	PURGING ENDED AT: 1016	TOTAL VOLUME PURGED (gallons): 1.05

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR (describe)	ORP (mV)
1007	0.6	.6	.15								
1012	.25	.85	.05	16.95	7.53	25.3	1027	0.44	9.19	clear	80.9
1014	.1	.95	.05	16.94	7.53	25.3	1029	0.43	9.41	"	80.2
1016	.1	1.05	.05	16.94	7.52	24.8	1024	0.44	7.93	"	79.1

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: CDM Smith Brendan Brown Andrew K. Ryan	SAMPLER(S) SIGNATURE(S): <i>[Signature]</i>	SAMPLING INITIATED AT: 1017	SAMPLING ENDED AT: 1025
PUMP OR TUBING DEPTH IN WELL (feet): 24	TUBING MATERIAL CODE: PE	FIELD-FILTERED: <input checked="" type="checkbox"/> N	FILTER SIZE: 0.45 µm
FIELD DECONTAMINATION: PUMP <input checked="" type="checkbox"/> Y	TUBING <input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> (replaced)	Filtration Equipment Type: metals can	
SAMPLE CONTAINER SPECIFICATION		DUPLICATE: <input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
gamas	1	PE	500 mL	None			Anions, Alk	APP	.05
above	1	PE	250 mL	Nitric Acid			Metals	APP	.05
↓	1	PE	125 mL	Sulfuric Acid			Total Phos	APP	.05

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)
pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

**Form FD 9000-24
GROUNDWATER SAMPLING LOG**

SITE NAME: CR-44	SITE LOCATION: Indiantown, Martin County, FL
WELL NO: C44B6B1R (MW348S)	SAMPLE ID: C44B6B1R (MW348S) DATE: 3/3/15

PURGING DATA

WELL PVC DIAMETER (inches): 4.0	TUBING DIAMETER (inches): 2.5	WELL SCREEN INTERVAL DEPTH: 20 feet to 30 feet	STATIC DEPTH TO WATER (feet): 16.15	PURGE PUMP TYPE OR BAILER: PP							
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable)											
= (feet - feet) X gallons/foot = gallons											
EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME (only fill out if applicable)											
By FS2212 = - gallons + (16.014 gallons/foot X 50 feet) + .07 gallons = 14 gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 25	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 25	PURGING INITIATED AT: 1054	PURGING ENDED AT: 1106	TOTAL VOLUME PURGED (gallons): 1.0							
TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR (describe)	ORP (mV)
1058	.6	.6	.15								
1102	.2	.8	.05	16.25	7.06	24.8	1085	0.34	8.28	clear	444
1104	.1	.9	.05	16.30	7.07	24.6	1085	0.34	8.43	"	383
1106	.1	1.0	.05	16.30	7.06	24.5	1084	.32	8.18	"	33.4
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016											
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)											

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: CDM Smith Brendan Brown Andrew Ryan			SAMPLER(S) SIGNATURE(S): <i>[Signature]</i>			SAMPLING INITIATED AT: 1107	SAMPLING ENDED AT: 1105		
PUMP OR TUBING DEPTH IN WELL (feet): 25			TUBING MATERIAL CODE: PE		FIELD-FILTERED: <input checked="" type="checkbox"/> N	FILTER SIZE: 0.45 µm			
FIELD DECONTAMINATION: PUMP Y N			TUBING Y N (replaced)			DUPLICATE: Y N			
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
Saline	1	PE	500 mL	None			Anions, Alk	APP	1.05
as	1	PE	250 mL	Nitric Acid			Metals	APP	↓
above	1	PE	125 mL	Sulfuric Acid			Total Phos	APP	↓

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

- NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)
pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

**Form FD 9000-24
GROUNDWATER SAMPLING LOG**

SITE NAME: CR-44	SITE LOCATION: Indiantown, Martin County,
WELL NO: C44B6C1R (MW289S)	SAMPLE ID: C44B6C1R (MW289S)
DATE: 3/3/15	

PURGING DATA

WELL PVC DIAMETER (inches): 4.0	TUBING DIAMETER (inches): 2.5	WELL SCREEN INTERVAL DEPTH: 20 feet to 30 feet	STATIC DEPTH TO WATER (feet): 17.88	PURGE PUMP TYPE OR BAILER: PP							
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable)											
= (feet - feet) X gallons/foot = gallons											
EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME (only fill out if applicable)											
= gallons + (gallons/foot X feet) + gallons = gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 25	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 25	PURGING INITIATED AT: 1129	PURGING ENDED AT: 1141	TOTAL VOLUME PURGED (gallons): 1.95							
TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR (describe)	ORP (mV)
1133	.6	.6	.15								
1136	.15	.75	.05	18.25	7.21	25.3	1162	0.25	9.82	clear	17.7
1138	.1	.85	.05	18.21	7.21	25.3	1161	0.26	5.73	"	18.0
1141	.1	.95	.05	18.21	7.21	25.5	1157	0.25	5.46	"	18.7
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016											
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)											

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: CDM Smith <i>Gregory Brown Andrew Ryan</i>				SAMPLER(S) SIGNATURE(S): <i>[Signature]</i>				SAMPLING INITIATED AT: 1142		SAMPLING ENDED AT: 1149	
PUMP OR TUBING DEPTH IN WELL (feet): 24				TUBING MATERIAL CODE: PE				FIELD-FILTERED: <input checked="" type="radio"/> N		FILTER SIZE: 0.45 µm	
FIELD DECONTAMINATION: PUMP <input checked="" type="radio"/> Y				TUBING <input checked="" type="radio"/> Y (replaced)				DUPLICATE: <input checked="" type="radio"/> Y			
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION				INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH					
So the	1	PE	500 mL	None			Anions, Alk		APP		
as	1	PE	250 mL	Nitric Acid			Metals		APP		
above	1	PE	125 mL	Sulfuric Acid			Total Phos, 12		APP		
REMARKS:											
MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)											
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)											

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)
pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

**Form FD 9000-24
GROUNDWATER SAMPLING LOG**

SITE NAME: CR-44	SITE LOCATION: Indiantown, Martin County, FL
WELL NO: C44B5A1R (MW275S)	SAMPLE ID: C44B5A1R (MW275S) DATE: 3/3/15

PURGING DATA

WELL PVC DIAMETER (inches): 4.0	TUBING DIAMETER (inches): 2.5	WELL SCREEN INTERVAL DEPTH: 20 feet to 30 feet	STATIC DEPTH TO WATER (feet): 18.61	PURGE PUMP TYPE OR BAILER: PP
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable)				
EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME (only fill out if applicable)				
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 24				
FINAL PUMP OR TUBING DEPTH IN WELL (feet): 24				
PURGING INITIATED AT: 1237				
PURGING ENDED AT: 1237				
TOTAL VOLUME PURGED (gallons): 1.1				

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR (describe)	ORP (mV)
1227	0.6	0.6	0.05								
1233	0.3	0.9	0.05	19.60	7.41	26.1	961	0.33	3.42	clear	28.26
1235	0.1	1.0	0.05	19.60	7.41	26.1	962	0.37	3.08	11	25.27
1237	0.1	1.1	0.05	19.60	7.40	25.9	961	0.38	3.60	11	25.3

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
 TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
 PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: CDM Smith Brendan Brown A. Kyan				SAMPLER(S) SIGNATURE(S): <i>[Signature]</i>				SAMPLING INITIATED AT: 1238		SAMPLING ENDED AT: 1244	
PUMP OR TUBING DEPTH IN WELL (feet): 24				TUBING MATERIAL CODE: NR		FIELD-FILTERED: <input checked="" type="checkbox"/> N		FILTER SIZE: 40 µm			
FIELD DECONTAMINATION: PUMP <input checked="" type="checkbox"/> Y				TUBING <input checked="" type="checkbox"/> Y (Replaced)				DUPLICATE: <input checked="" type="checkbox"/> Y			

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
Same	1	PE	500 mL	None			Anions, Alk	APP	0.05
AS	1	PE	250 mL	Nitric Acid			Metals	APP	1
clear	1	PE	125 mL	Sulfuric Acid			Total Phos, N	APP	1

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
 SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

- NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
 2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)
 pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

**Form FD 9000-24
GROUNDWATER SAMPLING LOG**

SITE NAME: CR-44	SITE LOCATION: Indiantown, Martin County, FL
WELL NO: C44B5A2R (MW275SI)	SAMPLE ID: C44B5A2R (MW275SI)
DATE: 3/3/15	

PURGING DATA

WELL PVC DIAMETER (inches): 4.0	TUBING DIAMETER (inches): 1.25	WELL SCREEN INTERVAL DEPTH: 40 feet to 50 feet	STATIC DEPTH TO WATER (feet): 17.98	PURGE PUMP TYPE OR BAILER: PP							
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable)											
= (feet - feet) X gallons/foot = gallons											
EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME (only fill out if applicable)											
By FS2212 = gallons + (.0014 gallons/foot X feet) + gallons = gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 45	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 45	PURGING INITIATED AT: 1249	PURGING ENDED AT: 1304	TOTAL VOLUME PURGED (gallons): 1.25							
TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR (describe)	ORP (mV)
1254	0.75	.75	.15								
1300	.3	1.05	.05	18.16	7.70	26.6	768	1.36	9.07	clear	17.6
1302	.1	1.15	.05	18.16	7.70	26.4	767	1.35	10.2	"	18.5
1304	.1	1.25	.05	18.16	7.70	26.3	766	1.33	8.57	"	18.7
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88											
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016											
PURGING EQUIPMENT CODES: B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)											

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: CDM Smith Brendan Brown A. Kyan				SAMPLER(S) SIGNATURE(S): <i>[Signature]</i>				SAMPLING INITIATED AT: 1305		SAMPLING ENDED AT: 1312			
PUMP OR TUBING DEPTH IN WELL (feet): 45				TUBING MATERIAL CODE: PE		FIELD-FILTERED: <input checked="" type="checkbox"/> N		FILTER SIZE: 0.45 µm					
FIELD DECONTAMINATION: PUMP <input checked="" type="checkbox"/> Y				TUBING <input checked="" type="checkbox"/> Y (replaced)				DUPLICATE: <input checked="" type="checkbox"/> Y					
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION				INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE		SAMPLE PUMP FLOW RATE (mL per minute)	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH							
same	1	PE	500 mL	None			Anions, Alk		APP		.05		
BS	1	PE	250 mL	Nitric Acid			Metals		↓		↓		
above	1	PE	125 mL	Sulfuric Acid			Total Phos		↓		↓		
REMARKS:													
MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)													
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)													

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
 2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)
 pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

Form FD 9000-24
GROUNDWATER SAMPLING LOG

SITE NAME: CR-44	SITE LOCATION: Indiantown, Martin County, FL
WELL NO: C44B5A3R (MW275DI)	SAMPLE ID: C44B5A3R (MW275DI)
DATE: 3/3/15	

PURGING DATA

WELL PVC DIAMETER (inches): 4.0	TUBING DIAMETER (inches): 1.25	WELL SCREEN INTERVAL DEPTH: 60 feet to 70 feet	STATIC DEPTH TO WATER (feet): 17.92	PURGE PUMP TYPE OR BAILER: PP							
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable) = (feet - feet) X gallons/foot = gallons											
EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME (only fill out if applicable) By FS221R = 8 - gallons + (.0014 gallons/foot X 6875 feet) + .07 gallons = 16 gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 64	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 64	PURGING INITIATED AT: 1318	PURGING ENDED AT: 1333	TOTAL VOLUME PURGED (gallons): 1.15							
TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR (describe)	ORP (mV)
1322	.16	.16	.15							d	13.4
1329	.35	.95	.105	18.27	9.34	26.4	620	3.53	5.52	clear	13.4
1331	.1	1.05	.105	18.26	9.34	26.4	620	3.5	5.08	"	13.6
1333	.1	1.15	.105	18.26	9.35	26.3	618	3.39	4.69	"	13.5
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016 PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)											

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: CDM Smith Brendan Brown A. Kyan				SAMPLER(S) SIGNATURE(S): <i>[Signature]</i>			SAMPLING INITIATED AT: 1334		SAMPLING ENDED AT: 1342	
PUMP OR TUBING DEPTH IN WELL (feet): 64				TUBING MATERIAL CODE: PE		FIELD-FILTERED: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N		FILTER SIZE: 0.45 µm		
FIELD DECONTAMINATION: PUMP <input checked="" type="checkbox"/> Y <input type="checkbox"/> N				TUBING <input checked="" type="checkbox"/> Y <input type="checkbox"/> N (replaced)		DUPLICATE: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N				
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH				
56ha	1	PE	500 mL	None			Anions, Alk	APP	0.05	
09	1	PE	250 mL	Nitric Acid			Metals	↓	↓	
above	1	PE	125 mL	Sulfuric Acid			Total Phos	↓	↓	
REMARKS:										
MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)										
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)										

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
 2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)
 pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)
 Revision Date: February 12, 2009

**Form FD 9000-24
GROUNDWATER SAMPLING LOG**

SITE NAME: CR-44	SITE LOCATION: Indiantown, Martin County, FL
WELL NO: C44B5A4R (MW275D)	SAMPLE ID: C44B5A4R (MW275D) DATE: 3/3/15

PURGING DATA

WELL PVC DIAMETER (inches): 4.0	TUBING DIAMETER (inches): 1.25	WELL SCREEN INTERVAL DEPTH: 90 feet to 100 feet	STATIC DEPTH TO WATER (feet): 17.8	PURGE PUMP TYPE OR BAILER: ESP PP							
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable)											
EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME (only fill out if applicable)											
$By FS2012 = - \text{gallons} + (.0014 \text{ gallons/foot} \times 105 \text{ feet}) + .07 \text{ gallons} = 12 \text{ gallons}$											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 95	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 95	PURGING INITIATED AT: 1353	PURGING ENDED AT: 1418	TOTAL VOLUME PURGED (gallons): 1.05							
TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR (describe)	ORP (mV)
1357	.6	.6	.15								
1401	.2	.8	.05	18.13	7.99	25.7	809	5.10	2.18	clear	22.8
1403	.1	.9	.05	18.13	7.98	25.6	808	5.07	1.57	"	23.4
1405	.1	1.0	.05	18.13	7.97	25.6	806	5.04	2.14	"	24.1
1414	.45	1.45	.05	18.11	7.97	25.6	806	4.72	1.89	"	25.3
1416	.1	1.55	.05	18.11	7.97	25.8	807	5.12	1.88	"	26.4
1418	.1	1.65	.05	18.11	7.97	25.9	807	5.10	2.11	"	26.8
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016											
PURGING EQUIPMENT CODES: B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)											

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: CDM Smith Kendall Bryan A. Ryan				SAMPLER(S) SIGNATURE(S): <i>[Signature]</i>			SAMPLING INITIATED AT: 1420		SAMPLING ENDED AT: 1427	
PUMP OR TUBING DEPTH IN WELL (feet): 95				TUBING MATERIAL CODE: PE		FIELD-FILTERED: <input checked="" type="checkbox"/> N		FILTER SIZE: 0.45 µm		
FIELD DECONTAMINATION: PUMP <input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N				TUBING <input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N (replaced)		DUPLICATE: <input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N				
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH				
SP10	1	PE	500 mL	None			Anions, Alk	APP	0.05	
CS	1	PE	250 mL	Nitric Acid			Metals	↓	↓	
ALAN	1	PE	125 mL	Sulfuric Acid			Total Phos	↓	↓	
REMARKS:										
MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)										
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPF = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)										

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
 2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)
 pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

DEP-SOP-001/01
 FT 1000 General Field Testing and Measurement

Form FD 9000-8: FIELD INSTRUMENT CALIBRATION RECORDS

INSTRUMENT (MAKE/MODEL#)

YSI Multiple

INSTRUMENT # Geotech #3399

PARAMETER: [check only one]

Hach Turbiditymeter

020400025969

- TEMPERATURE CONDUCTIVITY SALINITY pH ORP
 TURBIDITY RESIDUAL Cl DO OTHER _____

STANDARDS: [Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]

Standard A _____

Standard B _____

Standard C _____

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS	BOTTLE (number)
15/3/15	847	Turb	800	748		no	CCV	BS	4
	849		100	95.6		no	CCV		4
	849		20	19.3		no	CCV		4
	850		40.1	0.12		no	CCV		4
	851	pH	10.00	9.91		no	CCV		28
	852	pH	7.00	6.81		no	CCV		31
	854	pH	4.00	3.98		no	CCV		26
	855	DO	100	99.0		no	CCV		
	857	Cond	447	467		no	CCV		34
	859	Cond	1500	1482		no	CCV		10
	1447	Turb	800	763		no	CCV	BS	4
	1447		100	96.3		no	CCV		4
	1448		20	19.5		no	CCV		4
	1448		40.1	0.13		no	CCV		4
	1449	pH	10.00	9.896		no	CCV		28
	1450		7.00	6.85		no	CCV		31
	1451		4.00	4.18		no	CCV		26
	1453	Cond	447	465		no	CCV		34
	1455	Cond	1500	1462		no	CCV		10
	1457	DO	100	98.2		no	CCV		



March 13, 2015

Service Request No:J1501790

Jason Mills
CDM
2301 Maitland Center Parkway, Suite
300
Maitland, FL 32751

Laboratory Results for: C-44 Reservoir

Dear Jason,

Enclosed are the results of the sample(s) submitted to our laboratory March 04, 2015
For your reference, these analyses have been assigned our service request number **J1501790**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and ALS Environmental is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. In accordance to the NELAC 2003 Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Please contact me if you have any questions. My extension is 4409. You may also contact me via email at Craig.Myers@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Craig Myers
Project Manager

ADDRESS 9143 Philips Highway, Suite 200, Jacksonville, FL 32256
PHONE +1 904 739 2277 | FAX +1 904 739 2011
ALS Group USA, Corp.
dba ALS Environmental



SAMPLE DETECTION SUMMARY

CLIENT ID: C44B6A1R (MW347S) Lab ID: J1501790-001

Analyte	Results	Flag	MDL	PQL	Units	Method
Phosphorus, Total	0.158		0.0020	0.0050	mg/L	365.1
Calcium, Total Recoverable	73.7		0.02	0.10	mg/L	6010B
Iron, Total Recoverable	70	I	3	100	ug/L	6010B
Magnesium, Total Recoverable	10.7		0.02	0.10	mg/L	6010B
Sodium, Total Recoverable	137		0.03	0.50	mg/L	6010B
Chloride	97.9		0.2	1.0	mg/L	9056
Sulfate	125		0.2	1.0	mg/L	9056
Alkalinity as CaCO3, Total	266		5.0	5.0	mg/L	SM 2320 B
Bicarbonate Alkalinity as CaCO3	266		5.0	5.0	mg/L	SM 2320 B

CLIENT ID: C44B6B1R (MW348S) Lab ID: J1501790-002

Analyte	Results	Flag	MDL	PQL	Units	Method
Phosphorus, Total	0.0270		0.0020	0.0050	mg/L	365.1
Calcium, Total Recoverable	94.0		0.02	0.10	mg/L	6010B
Iron, Total Recoverable	590		3	100	ug/L	6010B
Magnesium, Total Recoverable	11.1		0.02	0.10	mg/L	6010B
Sodium, Total Recoverable	137		0.03	0.50	mg/L	6010B
Chloride	80.5		0.2	1.0	mg/L	9056
Nitrate as Nitrogen	0.12	I	0.03	0.20	mg/L	9056
Sulfate	124		0.2	1.0	mg/L	9056
Alkalinity as CaCO3, Total	326		5.0	5.0	mg/L	SM 2320 B
Bicarbonate Alkalinity as CaCO3	326		5.0	5.0	mg/L	SM 2320 B

CLIENT ID: C44B6C1R (MW289S) Lab ID: J1501790-003

Analyte	Results	Flag	MDL	PQL	Units	Method
Phosphorus, Total	0.0769		0.0020	0.0050	mg/L	365.1
Calcium, Total Recoverable	89.9		0.02	0.10	mg/L	6010B
Iron, Total Recoverable	30	I	3	100	ug/L	6010B
Magnesium, Total Recoverable	11.3		0.02	0.10	mg/L	6010B
Sodium, Total Recoverable	145		0.03	0.50	mg/L	6010B
Chloride	146		0.2	1.0	mg/L	9056
Sulfate	64.0		0.2	1.0	mg/L	9056
Alkalinity as CaCO3, Total	302		5.0	5.0	mg/L	SM 2320 B
Bicarbonate Alkalinity as CaCO3	302		5.0	5.0	mg/L	SM 2320 B

CLIENT ID: C44B5A1R (MW275S) Lab ID: J1501790-004

Analyte	Results	Flag	MDL	PQL	Units	Method
Phosphorus, Total	0.120		0.0020	0.0050	mg/L	365.1
Calcium, Total Recoverable	69.8		0.02	0.10	mg/L	6010B
Iron, Total Recoverable	10	I	3	100	ug/L	6010B
Magnesium, Total Recoverable	7.25		0.02	0.10	mg/L	6010B
Sodium, Total Recoverable	146		0.03	0.50	mg/L	6010B
Chloride	43.4		0.2	1.0	mg/L	9056



SAMPLE DETECTION SUMMARY

CLIENT ID: C44B5A4R (MW275D) Lab ID: J1501790-007

Analyte	Results	Flag	MDL	PQL	Units	Method
Nitrate as Nitrogen	0.27		0.03	0.20	mg/L	9056
Sulfate	51.5		0.2	1.0	mg/L	9056
Alkalinity as CaCO3, Total	254		5.0	5.0	mg/L	SM 2320 B
Bicarbonate Alkalinity as CaCO3	254		5.0	5.0	mg/L	SM 2320 B

CLIENT ID: C44B8B1R (MW345S) Lab ID: J1501790-008

Analyte	Results	Flag	MDL	PQL	Units	Method
Phosphorus, Total	0.0610		0.0020	0.0050	mg/L	365.1
Calcium, Total Recoverable	113		0.02	0.10	mg/L	6010B
Iron, Total Recoverable	40	I	3	100	ug/L	6010B
Magnesium, Total Recoverable	21.9		0.02	0.10	mg/L	6010B
Sodium, Total Recoverable	204		0.6	10	mg/L	6010B
Chloride	141		0.2	1.0	mg/L	9056
Nitrite as Nitrogen	0.10	I	0.02	0.20	mg/L	9056
Nitrate as Nitrogen	0.08	I	0.03	0.20	mg/L	9056
Sulfate	218		2	10	mg/L	9056
Alkalinity as CaCO3, Total	362		5.0	5.0	mg/L	SM 2320 B
Bicarbonate Alkalinity as CaCO3	362		5.0	5.0	mg/L	SM 2320 B

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
Department of Defense	66206	9/20/2016
Florida Department of Health	E82502	6/30/2015
Georgia Department of Natural Resources	958	6/30/2015
Kentucky Division of Waste Management	63	6/30/2015
Louisiana Department of Environmental Quality	02086	6/30/2015
Maine Department of Health and Human Services	2015002	2/3/2017
North Carolina Department of Environment and Natural Resources	527	12/31/2015
Pennsylvania Department of Environmental Protection	68-04835	8/31/2015
South Carolina Department of Health and Environmental Control	96021001	6/30/2015
Texas Commision on Environmental Quality	T104704197-13-5	5/31/2015
Virginia Environmental Accreditation Program	460191	12/14/2015

Data Qualifiers

Florida-DEP

- ! Data deviates from historically established concentration ranges
- * Not reported due to interference
- ? Data is rejected and should not be used
- A Value reported is the arithmetic mean of two or more determinations
- B Results based upon colony counts outside the acceptable range.
- D Measurement was made in the field.
- E Extra samples were taken at composite stations
- H Value based on field kit determination; results may not be accurate.
- I The reported value is between the laboratory method detection limit and the laboratory PQL.
- J Estimated value.
- K Off scale low. The value is less than the lowest calibration standard.
- L Off scale high. The analyte is above the acceptable level of quantitation.
- M The MDL/MRL has been elevated because the analyte could not be accurately quantified.
- N Presumptive evidence of presence of material.
- O Sampled, but analysis lost or not performed
- Q Sample held beyond the acceptable holding time.
- R Significant rain in the past 48 hours (typically in excess of 0.5 inches)
- T Estimated value, less than the MDL
- U Indicates that the compound was analyzed for but not detected.
- V Indicates that the analyte was detected in both the sample and the associated method blank.
- X Insufficient individuals were present in the sample to achieve a minimum of 280 organisms for identification (Stream Condition Index Analysis only)
- Y The laboratory analysis was from an unpreserved or improperly preserved sample.
- Z Too many colonies were present, the numeric value represents the filtration volume

ALS Laboratory Group

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Client: CDM Federal Programs Corporation
Project: C-44 Reservoir

Service Request:J1501790

SAMPLE CROSS-REFERENCE

<u>SAMPLE #</u>	<u>CLIENT SAMPLE ID</u>	<u>DATE</u>	<u>TIME</u>
J1501790-001	C44B6A1R (MW347S)	3/3/2015	1017
J1501790-002	C44B6B1R (MW348S)	3/3/2015	1107
J1501790-003	C44B6C1R (MW289S)	3/3/2015	1142
J1501790-004	C44B5A1R (MW275S)	3/3/2015	1238
J1501790-005	C44B5A2R (MW275SI)	3/3/2015	1305
J1501790-006	C44B5A3R (MW275DI)	3/3/2015	1334
J1501790-007	C44B5A4R (MW275D)	3/3/2015	1420
J1501790-008	C44B8B1R (MW345S)	3/3/2015	0915

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CDM Federal Programs Corporation
Project: C-44 Reservoir
Sample Matrix: Ground Water
Sample Name: C44B6A1R (MW347S)
Lab Code: J1501790-001

Service Request: J1501790
Date Collected: 03/03/15 10:17
Date Received: 03/04/15 08:28
Basis: NA

Inorganic Parameters

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>PQL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Calcium, Total Recoverable	6010B	73.7	mg/L	0.10	0.02	1	03/06/15 02:25	03/05/15	
Iron, Total Recoverable	6010B	70 I	ug/L	100	3	1	03/06/15 02:25	03/05/15	
Magnesium, Total Recoverable	6010B	10.7	mg/L	0.10	0.02	1	03/06/15 02:25	03/05/15	
Sodium, Total Recoverable	6010B	137	mg/L	0.50	0.03	1	03/06/15 02:25	03/05/15	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CDM Federal Programs Corporation
Project: C-44 Reservoir
Sample Matrix: Ground Water
Sample Name: C44B6A1R (MW347S)
Lab Code: J1501790-001

Service Request: J1501790
Date Collected: 03/03/15 10:17
Date Received: 03/04/15 08:28

Basis: NA

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	PQL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Alkalinity as CaCO ₃ , Total	SM 2320 B	266	mg/L	5.0	5.0	1	03/11/15	NA	
Bicarbonate Alkalinity as CaCO ₃	SM 2320 B	266	mg/L	5.0	5.0	1	03/11/15	NA	
Carbonate Alkalinity as CaCO ₃	SM 2320 B	5.0 U	mg/L	5.0	5.0	1	03/11/15	NA	
Chloride	9056	97.9	mg/L	1.0	0.2	1	03/05/15	NA	
Nitrate as Nitrogen	9056	0.03 U	mg/L	0.20	0.03	1	03/05/15	NA	
Nitrite as Nitrogen	9056	0.02 U	mg/L	0.20	0.02	1	03/05/15	NA	
Phosphorus, Total	365.1	0.158	mg/L	0.0050	0.0020	1	03/06/15	03/05/15	
Sulfate	9056	125	mg/L	1.0	0.2	1	03/05/15	NA	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CDM Federal Programs Corporation
Project: C-44 Reservoir
Sample Matrix: Ground Water
Sample Name: C44B6B1R (MW348S)
Lab Code: J1501790-002

Service Request: J1501790
Date Collected: 03/03/15 11:07
Date Received: 03/04/15 08:28
Basis: NA

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	PQL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium, Total Recoverable	6010B	94.0	mg/L	0.10	0.02	1	03/06/15 02:48	03/05/15	
Iron, Total Recoverable	6010B	590	ug/L	100	3	1	03/06/15 02:48	03/05/15	
Magnesium, Total Recoverable	6010B	11.1	mg/L	0.10	0.02	1	03/06/15 02:48	03/05/15	
Sodium, Total Recoverable	6010B	137	mg/L	0.50	0.03	1	03/06/15 02:48	03/05/15	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CDM Federal Programs Corporation
Project: C-44 Reservoir
Sample Matrix: Ground Water
Sample Name: C44B6B1R (MW348S)
Lab Code: J1501790-002

Service Request: J1501790
Date Collected: 03/03/15 11:07
Date Received: 03/04/15 08:28
Basis: NA

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	PQL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Alkalinity as CaCO3, Total	SM 2320 B	326	mg/L	5.0	5.0	1	03/11/15	NA	
Bicarbonate Alkalinity as CaCO3	SM 2320 B	326	mg/L	5.0	5.0	1	03/11/15	NA	
Carbonate Alkalinity as CaCO3	SM 2320 B	5.0 U	mg/L	5.0	5.0	1	03/11/15	NA	
Chloride	9056	80.5	mg/L	1.0	0.2	1	03/05/15	NA	
Nitrate as Nitrogen	9056	0.12 I	mg/L	0.20	0.03	1	03/05/15	NA	
Nitrite as Nitrogen	9056	0.02 U	mg/L	0.20	0.02	1	03/05/15	NA	
Phosphorus, Total	365.1	0.0270	mg/L	0.0050	0.0020	1	03/06/15	03/05/15	
Sulfate	9056	124	mg/L	1.0	0.2	1	03/05/15	NA	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CDM Federal Programs Corporation
Project: C-44 Reservoir
Sample Matrix: Ground Water
Sample Name: C44B6C1R (MW289S)
Lab Code: J1501790-003

Service Request: J1501790
Date Collected: 03/03/15 11:42
Date Received: 03/04/15 08:28

Basis: NA

Inorganic Parameters

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>PQL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Calcium, Total Recoverable	6010B	89.9	mg/L	0.10	0.02	1	03/06/15 02:53	03/05/15	
Iron, Total Recoverable	6010B	30 I	ug/L	100	3	1	03/06/15 02:53	03/05/15	
Magnesium, Total Recoverable	6010B	11.3	mg/L	0.10	0.02	1	03/06/15 02:53	03/05/15	
Sodium, Total Recoverable	6010B	145	mg/L	0.50	0.03	1	03/06/15 02:53	03/05/15	

ALS Group USA, Corp.
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Analytical Report

Client: CDM Federal Programs Corporation
Project: C-44 Reservoir
Sample Matrix: Ground Water
Sample Name: C44B6C1R (MW289S)
Lab Code: J1501790-003

Service Request: J1501790
Date Collected: 03/03/15 11:42
Date Received: 03/04/15 08:28

Basis: NA

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	PQL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Alkalinity as CaCO3, Total	SM 2320 B	302	mg/L	5.0	5.0	1	03/11/15	NA	
Bicarbonate Alkalinity as CaCO3	SM 2320 B	302	mg/L	5.0	5.0	1	03/11/15	NA	
Carbonate Alkalinity as CaCO3	SM 2320 B	5.0 U	mg/L	5.0	5.0	1	03/11/15	NA	
Chloride	9056	146	mg/L	1.0	0.2	1	03/05/15	NA	
Nitrate as Nitrogen	9056	0.03 U	mg/L	0.20	0.03	1	03/05/15	NA	
Nitrite as Nitrogen	9056	0.02 U	mg/L	0.20	0.02	1	03/05/15	NA	
Phosphorus, Total	365.1	0.0769	mg/L	0.0050	0.0020	1	03/06/15	03/05/15	
Sulfate	9056	64.0	mg/L	1.0	0.2	1	03/05/15	NA	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CDM Federal Programs Corporation
Project: C-44 Reservoir
Sample Matrix: Ground Water
Sample Name: C44B5A1R (MW275S)
Lab Code: J1501790-004

Service Request: J1501790
Date Collected: 03/03/15 12:38
Date Received: 03/04/15 08:28

Basis: NA

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	PQL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium, Total Recoverable	6010B	69.8	mg/L	0.10	0.02	1	03/06/15 02:58	03/05/15	
Iron, Total Recoverable	6010B	10 I	ug/L	100	3	1	03/06/15 02:58	03/05/15	
Magnesium, Total Recoverable	6010B	7.25	mg/L	0.10	0.02	1	03/06/15 02:58	03/05/15	
Sodium, Total Recoverable	6010B	146	mg/L	0.50	0.03	1	03/06/15 02:58	03/05/15	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CDM Federal Programs Corporation
Project: C-44 Reservoir
Sample Matrix: Ground Water
Sample Name: C44B5A1R (MW275S)
Lab Code: J1501790-004

Service Request: J1501790
Date Collected: 03/03/15 12:38
Date Received: 03/04/15 08:28
Basis: NA

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	PQL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Alkalinity as CaCO3, Total	SM 2320 B	268	mg/L	5.0	5.0	1	03/11/15	NA	
Bicarbonate Alkalinity as CaCO3	SM 2320 B	268	mg/L	5.0	5.0	1	03/11/15	NA	
Carbonate Alkalinity as CaCO3	SM 2320 B	5.0 U	mg/L	5.0	5.0	1	03/11/15	NA	
Chloride	9056	43.4	mg/L	1.0	0.2	1	03/05/15	NA	
Nitrate as Nitrogen	9056	0.16 I	mg/L	0.20	0.03	1	03/05/15	NA	
Nitrite as Nitrogen	9056	0.11 I	mg/L	0.20	0.02	1	03/05/15	NA	
Phosphorus, Total	365.1	0.120	mg/L	0.0050	0.0020	1	03/06/15	03/05/15	
Sulfate	9056	158	mg/L	1.0	0.2	1	03/05/15	NA	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CDM Federal Programs Corporation
Project: C-44 Reservoir
Sample Matrix: Ground Water
Sample Name: C44B5A2R (MW275SI)
Lab Code: J1501790-005

Service Request: J1501790
Date Collected: 03/03/15 13:05
Date Received: 03/04/15 08:28

Basis: NA

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	PQL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium, Total Recoverable	6010B	56.9	mg/L	0.10	0.02	1	03/06/15 03:03	03/05/15	
Iron, Total Recoverable	6010B	9 I	ug/L	100	3	1	03/06/15 03:03	03/05/15	
Magnesium, Total Recoverable	6010B	8.88	mg/L	0.10	0.02	1	03/06/15 03:03	03/05/15	
Sodium, Total Recoverable	6010B	94.9	mg/L	0.50	0.03	1	03/06/15 03:03	03/05/15	

ALS Group USA, Corp.
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Analytical Report

Client: CDM Federal Programs Corporation
Project: C-44 Reservoir
Sample Matrix: Ground Water
Sample Name: C44B5A2R (MW275SI)
Lab Code: J1501790-005

Service Request: J1501790
Date Collected: 03/03/15 13:05
Date Received: 03/04/15 08:28

Basis: NA

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	PQL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Alkalinity as CaCO3, Total	SM 2320 B	185	mg/L	5.0	5.0	1	03/11/15	NA	
Bicarbonate Alkalinity as CaCO3	SM 2320 B	185	mg/L	5.0	5.0	1	03/11/15	NA	
Carbonate Alkalinity as CaCO3	SM 2320 B	5.0 U	mg/L	5.0	5.0	1	03/11/15	NA	
Chloride	9056	72.6	mg/L	1.0	0.2	1	03/05/15	NA	
Nitrate as Nitrogen	9056	0.35	mg/L	0.20	0.03	1	03/05/15	NA	
Nitrite as Nitrogen	9056	0.15 I	mg/L	0.20	0.02	1	03/05/15	NA	
Phosphorus, Total	365.1	0.138	mg/L	0.0050	0.0020	1	03/06/15	03/05/15	
Sulfate	9056	84.7	mg/L	1.0	0.2	1	03/05/15	NA	

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dba ALS Environmental

Analytical Report

Client: CDM Federal Programs Corporation
Project: C-44 Reservoir
Sample Matrix: Ground Water
Sample Name: C44B5A3R (MW275DI)
Lab Code: J1501790-006

Service Request: J1501790
Date Collected: 03/03/15 13:34
Date Received: 03/04/15 08:28
Basis: NA

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	PQL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium, Total Recoverable	6010B	19.1	mg/L	0.10	0.02	1	03/06/15 03:08	03/05/15	
Iron, Total Recoverable	6010B	10 I	ug/L	100	3	1	03/06/15 03:08	03/05/15	
Magnesium, Total Recoverable	6010B	1.74	mg/L	0.10	0.02	1	03/06/15 03:08	03/05/15	
Sodium, Total Recoverable	6010B	189	mg/L	0.50	0.03	1	03/06/15 03:08	03/05/15	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CDM Federal Programs Corporation
Project: C-44 Reservoir
Sample Matrix: Ground Water
Sample Name: C44B5A3R (MW275DI)
Lab Code: J1501790-006

Service Request: J1501790
Date Collected: 03/03/15 13:34
Date Received: 03/04/15 08:28
Basis: NA

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	PQL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Alkalinity as CaCO3, Total	SM 2320 B	114	mg/L	5.0	5.0	1	03/11/15	NA	
Bicarbonate Alkalinity as CaCO3	SM 2320 B	43.9	mg/L	5.0	5.0	1	03/11/15	NA	
Carbonate Alkalinity as CaCO3	SM 2320 B	70.1	mg/L	5.0	5.0	1	03/11/15	NA	
Chloride	9056	69.6	mg/L	1.0	0.2	1	03/05/15	NA	
Nitrate as Nitrogen	9056	0.14 I	mg/L	0.20	0.03	1	03/05/15	NA	
Nitrite as Nitrogen	9056	0.73	mg/L	0.20	0.02	1	03/05/15	NA	
Phosphorus, Total	365.1	0.130	mg/L	0.0050	0.0020	1	03/06/15	03/05/15	
Sulfate	9056	186	mg/L	1.0	0.2	1	03/05/15	NA	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CDM Federal Programs Corporation
Project: C-44 Reservoir
Sample Matrix: Ground Water
Sample Name: C44B5A4R (MW275D)
Lab Code: J1501790-007

Service Request: J1501790
Date Collected: 03/03/15 14:20
Date Received: 03/04/15 08:28

Basis: NA

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	PQL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium, Total Recoverable	6010B	98.9	mg/L	0.10	0.02	1	03/06/15 03:22	03/05/15	
Iron, Total Recoverable	6010B	5 I	ug/L	100	3	1	03/06/15 03:23	03/05/15	
Magnesium, Total Recoverable	6010B	12.3	mg/L	0.10	0.02	1	03/06/15 03:23	03/05/15	
Sodium, Total Recoverable	6010B	56.3	mg/L	1.0	0.06	2	03/09/15 21:01	03/05/15	

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Analytical Report

Client: CDM Federal Programs Corporation
Project: C-44 Reservoir
Sample Matrix: Ground Water
Sample Name: C44B5A4R (MW275D)
Lab Code: J1501790-007

Service Request: J1501790
Date Collected: 03/03/15 14:20
Date Received: 03/04/15 08:28

Basis: NA

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	PQL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Alkalinity as CaCO3, Total	SM 2320 B	254	mg/L	5.0	5.0	1	03/11/15	NA	
Bicarbonate Alkalinity as CaCO3	SM 2320 B	254	mg/L	5.0	5.0	1	03/11/15	NA	
Carbonate Alkalinity as CaCO3	SM 2320 B	5.0 U	mg/L	5.0	5.0	1	03/11/15	NA	
Chloride	9056	84.8	mg/L	1.0	0.2	1	03/05/15	NA	
Nitrate as Nitrogen	9056	0.27	mg/L	0.20	0.03	1	03/05/15	NA	
Nitrite as Nitrogen	9056	0.02 U	mg/L	0.20	0.02	1	03/05/15	NA	
Phosphorus, Total	365.1	0.0211	mg/L	0.0050	0.0020	1	03/06/15	03/05/15	
Sulfate	9056	51.5	mg/L	1.0	0.2	1	03/05/15	NA	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CDM Federal Programs Corporation
Project: C-44 Reservoir
Sample Matrix: Ground Water
Sample Name: C44B8B1R (MW345S)
Lab Code: J1501790-008

Service Request: J1501790
Date Collected: 03/03/15 09:15
Date Received: 03/04/15 08:28
Basis: NA

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	PQL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium, Total Recoverable	6010B	113	mg/L	0.10	0.02	1	03/06/15 03:27	03/05/15	
Iron, Total Recoverable	6010B	40 I	ug/L	100	3	1	03/06/15 03:28	03/05/15	
Magnesium, Total Recoverable	6010B	21.9	mg/L	0.10	0.02	1	03/06/15 03:27	03/05/15	
Sodium, Total Recoverable	6010B	204	mg/L	10	0.6	20	03/09/15 21:06	03/05/15	

ALS Group USA, Corp.
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Analytical Report

Client: CDM Federal Programs Corporation
Project: C-44 Reservoir
Sample Matrix: Ground Water
Sample Name: C44B8B1R (MW345S)
Lab Code: J1501790-008

Service Request: J1501790
Date Collected: 03/03/15 09:15
Date Received: 03/04/15 08:28

Basis: NA

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	PQL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Alkalinity as CaCO3, Total	SM 2320 B	362	mg/L	5.0	5.0	1	03/11/15	NA	
Bicarbonate Alkalinity as CaCO3	SM 2320 B	362	mg/L	5.0	5.0	1	03/11/15	NA	
Carbonate Alkalinity as CaCO3	SM 2320 B	5.0 U	mg/L	5.0	5.0	1	03/11/15	NA	
Chloride	9056	141	mg/L	1.0	0.2	1	03/05/15	NA	
Nitrate as Nitrogen	9056	0.08 I	mg/L	0.20	0.03	1	03/05/15	NA	
Nitrite as Nitrogen	9056	0.10 I	mg/L	0.20	0.02	1	03/05/15	NA	
Phosphorus, Total	365.1	0.0610	mg/L	0.0050	0.0020	1	03/06/15	03/05/15	
Sulfate	9056	218	mg/L	10	2	10	03/05/15	NA	

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Analytical Report

Client: CDM Federal Programs Corporation
Project: C-44 Reservoir
Sample Matrix: Ground Water
Sample Name: Method Blank
Lab Code: J1501790-MB

Service Request: J1501790
Date Collected: NA
Date Received: NA
Basis: NA

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	PQL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium, Total Recoverable	6010B	0.08 I	mg/L	0.10	0.02	1	03/06/15 01:58	03/05/15	
Iron, Total Recoverable	6010B	3 I	ug/L	100	3	1	03/06/15 01:58	03/05/15	
Magnesium, Total Recoverable	6010B	0.02 U	mg/L	0.10	0.02	1	03/06/15 01:58	03/05/15	
Sodium, Total Recoverable	6010B	0.03 U	mg/L	0.50	0.03	1	03/06/15 01:58	03/05/15	

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dba ALS Environmental

Analytical Report

Client: CDM Federal Programs Corporation
Project: C-44 Reservoir
Sample Matrix: Ground Water
Sample Name: Method Blank
Lab Code: J1501790-MB

Service Request: J1501790
Date Collected: NA
Date Received: NA
Basis: NA

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	PQL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Alkalinity as CaCO3, Total	SM 2320 B	5.0 U	mg/L	5.0	5.0	1	03/11/15	NA	
Bicarbonate Alkalinity as CaCO3	SM 2320 B	5.0 U	mg/L	5.0	5.0	1	03/11/15	NA	
Carbonate Alkalinity as CaCO3	SM 2320 B	5.0 U	mg/L	5.0	5.0	1	03/11/15	NA	
Chloride	9056	0.2 U	mg/L	1.0	0.2	1	03/05/15	NA	
Nitrate as Nitrogen	9056	0.03 U	mg/L	0.20	0.03	1	03/05/15	NA	
Nitrite as Nitrogen	9056	0.02 U	mg/L	0.20	0.02	1	03/05/15	NA	
Phosphorus, Total	365.1	0.0020 U	mg/L	0.0050	0.0020	1	03/06/15	03/05/15	
Sulfate	9056	0.2 U	mg/L	1.0	0.2	1	03/05/15	NA	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: CDM Federal Programs Corporation
Project: C-44 Reservoir
Sample Matrix: Ground Water

Service Request:J1501790
Date Collected:03/03/15
Date Received:03/04/15
Date Analyzed:3/6/15

Duplicate Matrix Spike Summary
Inorganic Parameters

Sample Name: C44B6A1R (MW347S)
Lab Code: J1501790-001

Units:mg/L
Basis:NA

Matrix Spike
J1501790-001MS

Duplicate Matrix Spike
J1501790-001DMS

Analyte Name	Method	Sample		Spike		Spike		% Rec		RPD	RPD Limit
		Result	Result	Amount	% Rec	Result	Amount	% Rec	Limits		
Calcium, Total Recoverable	6010B	73.7	80.5	5.00	136 #	80.3	5.00	131 #	75-125	<1	20
Magnesium, Total Recoverable	6010B	10.7	16.1	5.00	107	16.2	5.00	111	75-125	1	20
Sodium, Total Recoverable	6010B	137	166	25.0	116 #	166	25.0	115 #	75-125	<1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

Client: CDM Federal Programs Corporation
Project: C-44 Reservoir
Sample Matrix: Ground Water

Service Request:J1501790
Date Collected:03/03/15
Date Received:03/04/15
Date Analyzed:3/6/15

Duplicate Matrix Spike Summary
Inorganic Parameters

Sample Name: C44B6A1R (MW347S)
Lab Code: J1501790-001

Units:ug/L
Basis:NA

Matrix Spike
J1501790-001MS

Duplicate Matrix Spike
J1501790-001DMS

Analyte Name	Method	Sample Result	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec	% Rec Limits	RPD	RPD Limit
Iron, Total Recoverable	6010B	70	5020	5000	99	5040	5000	99	75-125	<1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: CDM Federal Programs Corporation
Project: C-44 Reservoir
Sample Matrix: Ground Water

Service Request: J1501790
Date Analyzed: 03/06/15

Lab Control Sample Summary
Inorganic Parameters

Units:mg/L
Basis:NA

Lab Control Sample
J1501790-LCS

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Calcium, Total Recoverable	6010B	5.12	5.00	102	80-120
Magnesium, Total Recoverable	6010B	5.07	5.00	101	80-120
Sodium, Total Recoverable	6010B	26.7	25.0	107	80-120

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: CDM Federal Programs Corporation
Project: C-44 Reservoir
Sample Matrix: Ground Water

Service Request: J1501790
Date Analyzed: 03/06/15

Lab Control Sample Summary
Inorganic Parameters

Units:ug/L

Basis:NA

Lab Control Sample

J1501790-LCS

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Iron, Total Recoverable	6010B	5000	5000	100	80-120

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: CDM Federal Programs Corporation
Project: C-44 Reservoir
Sample Matrix: Ground Water

Service Request: J1501790
Date Collected: 03/03/15
Date Received: 03/04/15
Date Analyzed: 03/06/15

Replicate Sample Summary
General Chemistry Parameters

Sample Name: C44B6A1R (MW347S)
Lab Code: J1501790-001

Units: mg/L
Basis: NA

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>PQL</u>	<u>MDL</u>	<u>Sample Result</u>	<u>Duplicate Sample J1501790-001DUP Result</u>	<u>Average</u>	<u>RPD</u>	<u>RPD Limit</u>
Phosphorus, Total	365.1	0.0050	0.0020	0.158	0.157	0.158	<1	20

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ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: CDM Federal Programs Corporation
Project: C-44 Reservoir
Sample Matrix: Ground Water

Service Request: J1501790
Date Collected: 03/03/15
Date Received: 03/04/15
Date Analyzed: 03/05/15

Replicate Sample Summary
General Chemistry Parameters

Sample Name: C44B5A2R (MW275SI)
Lab Code: J1501790-005

Units: mg/L
Basis: NA

Analyte Name	Analysis Method	PQL	MDL	Sample Result	Duplicate Sample J1501790-005DUP Result	Average	RPD	RPD Limit
Chloride	9056	1.0	0.2	72.6	72.4	72.5	<1	20
Sulfate	9056	1.0	0.2	84.7	84.4	84.6	<1	20
Nitrate as Nitrogen	9056	0.20	0.03	0.35	0.35	0.350	2	20
Nitrite as Nitrogen	9056	0.20	0.02	0.15 I	0.14 I	0.144	1	20

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ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: CDM Federal Programs Corporation
Project: C-44 Reservoir
Sample Matrix: Ground Water

Service Request: J1501790
Date Collected: 03/03/15
Date Received: 03/04/15
Date Analyzed: 03/11/15

**Replicate Sample Summary
 General Chemistry Parameters**

Sample Name: C44B8B1R (MW345S)
Lab Code: J1501790-008

Units: mg/L
Basis: NA

Analyte Name	Analysis Method	PQL	MDL	Sample Result	Duplicate Sample J1501790-008DUP Result	Average	RPD	RPD Limit
Alkalinity as CaCO ₃ , Total	SM 2320 B	5.0	5.0	362	362	362	<1	20
Bicarbonate Alkalinity as CaCO ₃	SM 2320 B	5.0	5.0	362	362	362	<1	20
Carbonate Alkalinity as CaCO ₃	SM 2320 B	5.0	5.0	5.0 U	5.0 U	NC	NC	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: CDM Federal Programs Corporation
Project: C-44 Reservoir
Sample Matrix: Ground Water

Service Request: J1501790
Date Collected: 03/03/15
Date Received: 03/04/15
Date Analyzed: 03/6/15
Date Extracted: 03/5/15

Matrix Spike Summary
Phosphorus, Total

Sample Name: C44B6A1R (MW347S)
Lab Code: J1501790-001
Analysis Method: 365.1
Prep Method: Method

Units: mg/L
Basis: NA

Matrix Spike
J1501790-001MS

<u>Analyte Name</u>	<u>Sample Result</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>% Rec Limits</u>
Phosphorus, Total	0.158	0.624	0.500	93	90-110

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: CDM Federal Programs Corporation
Project: C-44 Reservoir
Sample Matrix: Ground Water

Service Request:J1501790
Date Collected:03/03/15
Date Received:03/04/15
Date Analyzed:3/5/15

Matrix Spike Summary
General Chemistry Parameters

Sample Name: C44B5A2R (MW275SI)
Lab Code: J1501790-005

Units:mg/L
Basis:NA

Matrix Spike
J1501790-005MS

Analyte Name	Method	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Chloride	9056	72.6	92.9	25.0	81 *	90-110
Nitrate as Nitrogen	9056	0.35	2.47	2.00	106	90-110
Nitrite as Nitrogen	9056	0.15	2.00	2.00	93	90-110
Sulfate	9056	84.7	105	25.0	80 *	90-110

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: CDM Federal Programs Corporation
Project: C-44 Reservoir
Sample Matrix: Ground Water

Service Request: J1501790
Date Analyzed: 03/05/15 - 03/11/15

Lab Control Sample Summary
General Chemistry Parameters

Units:mg/L
Basis:NA

Lab Control Sample
J1501790-LCS

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Alkalinity as CaCO3, Total	SM 2320 B	256	250	102	85-115
Chloride	9056	24.6	25.0	98	90-110
Nitrate as Nitrogen	9056	2.16	2.00	108	90-110
Nitrite as Nitrogen	9056	2.07	2.00	103	90-110
Phosphorus, Total	365.1	0.477	0.500	95	90-110
Sulfate	9056	24.8	25.0	99	90-110

Cooler Receipt Form

Client: CDM Smith Service Request #: 31501790
 Project: C44 Reservoir
 Cooler received on 3.4.15 and opened on 3.4.15 GR
 COURIER: ALS UPS FEDEX Client Other BlueStreak Bill # _____

- 1 Were custody seals on outside of cooler? Yes No
 If yes, how many and where? #: 1 on lid other _____
- 2 Were seals intact and signature and date correct? Yes No N/A
- 3 Were custody papers properly filled out? Yes No N/A
- 4 Temperature of cooler(s) upon receipt (Should be 0°C and ≤ 6°C) 4.0 _____
- 5 Thermometer ID T71 _____
- 6 Temperature Blank Present? Yes No
- 7 Were Ice or Ice Packs present Ice Ice Packs No
- 8 Did all bottles arrive in good condition (unbroken, etc....)? Yes No N/A
- 9 Type of packing material present
 Netting Vial Holder Bubble Wrap
 Paper Styrofoam Other N/A
- 10 Were all bottle labels complete (sample ID, preservation, etc....)? Yes No N/A
- 11 Did all bottle labels and tags agree with custody papers? Yes No N/A
- 12 Were the correct bottles used for the tests indicated? Yes No N/A
- 13 Were all of the preserved bottles received with the appropriate preservative?
 HNO3 pH<2 H2SO4 pH<2 ZnAc2/NaOH pH>9 NaOH pH>12 HCl pH<2
Preservative additions noted below
- 14 Were all samples received within analysis holding times? Yes No N/A
- 15 Were all VOA vials free of air bubbles? If present, note below Yes No N/A
- 16 Where did the bottles originate? ALS Client

Sample ID	Reagent	Lot #	ml added	Initials Date/Time

Additional comments and/or explanation of all discrepancies noted above:

Client approval to run samples if discrepancies noted: _____ Date: _____



CHAIN OF CUSTODY / LABORATORY ANALYSIS REQUEST FORM

SR# J1501790

T042907

001, 002, 003, 004, 005, 006, 007, 008

9143 Phillips Highway, Suite 200, Jacksonville, FL 32256
Phone (904) 739-2277 / 800-685-7222 x06 / FAX (904) 739-2011

J1501790 5
CDM
C-44 Reservoir



CLIENT SAMPLE ID	LABID	SAMPLING Date Time	Matrix	NUMBER OF CONTAINERS						REMARKS	
				48H	14D	28D	180D	5010B / Ca T	5010B / Mg T		5010B / Na T
C44B6A1R (MW347S)		3/3/15 10:17	Liquid	3	X	X	X	X	X	X	
C44B6B1R (MW348S)		" 11:07	Liquid	3	X	X	X	X	X	X	
C44B6C1R (MW289S)		" 11:42	Liquid	3	X	X	X	X	X	X	
C44B5A1R (MW275S)		" 12:38	Liquid	3	X	X	X	X	X	X	
C44B5A2R (MW275SI)		" 13:05	Liquid	3	X	X	X	X	X	X	
C44B5A3R (MW275DI)		" 13:34	Liquid	3	X	X	X	X	X	X	
C44B5A4R (MW275D)		" 14:20	Liquid	3	X	X	X	X	X	X	
C44B6B1R (MW345S)		" 9:15	Liquid	3	X	X	X	X	X	X	
9. 38			Liquid								
10. 38			Liquid								

Project Name: C-44 Reservoir
 Project Number: Report to Jason Mills
2301 Maitland Center Parkway
 Maitland FL, 32751
 Phone # 407-680-2552 FAX # 407-875-1161
 Sampler Signature [Signature] Sampler Printed Name Brendan Brown

Special Instructions/Comments: 4.0.c

Turnaround Requirements
 RUSH (SURCHARGES APPLY)
 Standard
 REQUESTED FAX DATE _____
 Requested Report Date _____

Report Requirements
 I. Results Only
 II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
 III. Results + QC and Calibration Summaries
 IV. Data Validation Report with Raw Data
 EData Yes No

Invoice Information
 P.O.# _____
 Bill To: _____

Relinquished By: Signature <u>[Signature]</u>	Relinquished By: Signature <u>[Signature]</u>	Received By: Signature <u>[Signature]</u>
Printed Name <u>Brendan Brown</u>	Printed Name <u>Brendan Brown</u>	Printed Name <u>[Signature]</u>
Firm <u>CM Smith</u>	Firm <u>Blue Streak Blue Streak</u>	Firm <u>ALS</u>
Date/Time <u>2/26/15</u>	Date/Time <u>3/3/15 1510</u>	Date/Time <u>3.15.0828</u>