

COMPLETION REPORT FOR WELL NO. 1-12

**ENVIRONMENTAL DISPOSAL SYSTEMS
Romulus, Michigan**

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EPA REGION 5



ENVIRONMENTAL DISPOSAL SYSTEMS, INC.

199 W. Brown Street • Suite 200 • Birmingham, MI 48009 • Telephone (248) 642-4214 • Facsimile (248) 642-7122

EDS CITRIN DRIVE FACILITY PROGRESS REPORT

PAGE 2

PREPARED FOR: Dana Rzeznik, USEPA (312) 886-4235 **ELEVATIONS:** GL
 Ray Vugrinovich, MDEQ-GSD (517) 241-1595 DF
 Bruce Waldo, MDEQ-GSD (734) 432-1278 KB
 Ken Davis, Subsurface (713) 880-3248

WELL NAME: EDS 1-12
LEGAL DESC: SE NE SW Section 12, T3S-R9E
 Wayne County, Michigan

USEPA PERMIT#: MI-163-1W-C007
MDEQ PERMIT #: M-452

DATE **DESCRIPTION**

11/26/01 At 4:00AM R.U. Cementers. Cement casing w/ 200 sx Class A,
 3% Ca Cl2. No cmt. ret. to surf.
 Finished job @ 5:45AM. Shut down, W.O.C.
 Preparing to grout csg. from surface.
 At 10:00AM grouted 20" csg. w/ 50 sx cmt.
 Ran Temperature Survey.

11/27/01 At 6:00AM W.O.C.
 M.U. 17 1/2" bit, T.I.H.
 Drilled cmt., float collar, guide shoe.
 Drilled formation to 124', lost returns.
 Drilled blind to 133'.
 Rig Repair. Pumped LCM pill (Poly Swell).
 Drilling ahead w/o returns.

11/28/01 At 6:00AM drilling 17 1/2" hole w/o returns at 194'.



COMPLETION REPORT FOR WELL NO. 1-12

**ENVIRONMENTAL DISPOSAL SYSTEMS
Romulus, Michigan**

Subsurface Project No. 60D5295

April 2002

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EPA REGION 5**

Prepared By:

**SUBSURFACE TECHNOLOGY, INC.
Houston, Texas**

SUBSURFACE

April 5, 2002

Mr. Harlan Gerrish – WU-163
USEPA, Region 5
77 W. Jackson Boulevard
Chicago, Illinois 60604-3507

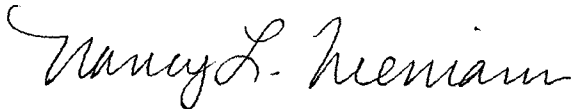
RE: Environmental Disposal Systems, Romulus, Michigan
Completion Report for Well No. 1-12 and Completion Report for Well No. 2-12
Subsurface Project No. 60D5295

Dear Mr. Gerrish:

On behalf of Environmental Disposal Systems (EDS), Subsurface Technology, Inc., is pleased to transmit one copy of each of the referenced reports.

Please do not hesitate to contact Mr. Doug Wicklund of EDS at (248) 642-4214 if you have questions about the reports.

Sincerely,



Nancy L. Niemann
Senior Geologist

NLN/tjp
Enclosures

c: Doug Wicklund, EDS

gerrish ltr1

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FIGURE

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- ATTACHMENT 2: 20-Inch Casing Detail
- ATTACHMENT 3: 20-Inch Cement Report
- ATTACHMENT 4: 13-3/8-Inch Casing Detail
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ATTACHMENT 16: Water Sample Analysis

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- 49 - Log No. 2: 17-1/2-Inch Baker DIFL/GR, Dated November 30, 2001
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- 51 ✓ Log No. 4: 17-1/2-Inch 4-Arm Caliper, Dated November 30, 2001
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- 43 - Log No. 7: 12-1/4-Inch Baker DIFL/GR, Dated December 3, 2001
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- 55 ✓ Log No. 9: 13-3/8-Inch Segmented Cement Bond Log, Dated December 3, 2001
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- 60 -Log No. 15: 8-3/4-Inch Borehole Imager Log, Dated December 18, 2001
- 61 ↓ Log No. 16: 9-5/8-Inch Segmented Cement Bond Log, Dated December 18, 2001
- 62 ↓ ^{16A Over Day Temp. Survey} Log No. 17: Michigan Wireline 7-Inch Cement Bond Log, Dated January 8, 2002
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EXECUTIVE SUMMARY

Environmental Disposal Systems, Inc. (EDS) submitted a Class I Hazardous UIC well permit application to the United States Environmental Protection Agency (USEPA), Region 5, on May 28, 1996.

The USEPA granted approval to construct and operate Class I Hazardous Injection Well No. 1-12 (Permit No. MI-163-1W-C007) on April 24, 1998.

Field operations commenced on September 27, 2001, with the construction of the drilling pad. All depths in this report are referenced to the drilling rig rotary kelly bushing (RKB). This "zero" point was 8 feet above ground level.

A rotary drilling rig was moved on site and a 24-inch surface hole was spudded on November 24, 2001. The 24-inch surface hole was drilled to 121 feet and 20-inch conductor casing was set and cemented in place at 119 feet.

A 17-1/2-inch diameter hole was drilled to a depth of 405 feet and geophysical logs were run. A 13-3/8-inch diameter surface casing was installed at a depth of 396 feet and cemented in place.

A 12-1/4-inch hole was drilled to a depth of 825 feet and geophysical logs were run. A cement bond log was run over the length of the 13-3/8-inch surface casing prior to the installation of the intermediate casing string. The 9-5/8-inch intermediate casing was installed at 824 feet, with cement circulated through the annular space to the surface with good cement returns. The casing was successfully pressure tested to 1250 pounds per square inch (psi) prior to drilling out the cement and float equipment.

An 8-3/4-inch hole was drilled to a depth of 1494 feet, at which point directional drilling equipment was rigged up to directionally drill the well to the designated target. The hole was drilled to 3060 feet and a core was obtained from 3060 feet to 3090 feet. The core hole was reamed out and a second core was obtained from 4156 feet to 4186 feet. The hole was drilled to a true vertical depth of 4535 feet and geophysical logs were run. A

cement bond log was run over the length of the 9-5/8-inch intermediate casing prior to the installation of the long-string casing.

An open-hole bridge plug was set at 4110 feet and the hole was filled with frac sand to a depth of 4067 feet. The 7-inch, long-string casing was set at a measured depth of 4080 feet and cemented to the surface in two stages. The long-string casing was successfully pressure tested to 1500 psi prior to drilling out the cement and float equipment and washing out the open hole to the top of the bridge plug. A cement bond log was then run over the length of the 7-inch casing. During the next several weeks, formation fluid samples were obtained for analysis, a series of injectivity tests were conducted, and a casing inspection log and a baseline temperature survey were run.

On March 25, 2002, the Hastalloy injection packer was run into the well and set at a depth of 4066 feet and successfully pressure tested. The seal assembly was made up on the fiberglass injection string and run in the hole. The seal assembly was stung into the packer and the annulus was successfully pressure tested.

On March 27, 2002, the wellhead was nipped up and the completion rig was rigged down and moved out.

1.0 INTRODUCTION

EDS' Well No. 1-12 was constructed and tested between September 2001 and April 2002, at EDS' Citrin Drive facility located in Romulus, Michigan.

The construction and testing of this new Class I hazardous waste disposal well were permitted under USEPA Permit No. MI-163-1W-C007, dated April 24, 1998. All work associated with Well No. 1-12 was completed in accordance with the provisions specified in the permit approved by the USEPA.

This report summarizes all work performed on Well No. 1-12.

2.0 SUMMARY OF DAILY OPERATIONS

Note: All depths in this report are referenced from an RKB elevation of 639 feet above sea level.

The surface location for Well No. 1-12 was surveyed and staked 1066 feet from the north line and 303 feet from the west line of the Southeast 1/4 of Section 12, Township 3 South, Range 9 East, Wayne County, Michigan (Survey Plat, Attachment 1). EDS began construction of the drilling pad for disposal Well Nos. 1-12 and 2-12 on September 27, 2001. McLachlan Drilling Company's Rig No. 2 began moving from the Well No. 2-12 site to the Well No. 1-12 site on November 20, 2001.

The 24-inch surface hole was spudded on November 24, 2001, and drilled to a depth of 121 feet. A total of three joints (136.87 feet) of 20-inch, 94 lbs/ft, H-40, conductor casing was set at 119 feet with a stab-in float shoe (Casing Detail, Attachment 2). The annulus was cemented through drillpipe by Halliburton with 200 sacks of Class "A" cement containing 3% CaCl₂. Approximately 75% mud returns were observed throughout the cementing and no cement returns were recovered at the surface (Cementing Report, Attachment 3). The top 50 feet of the annulus was cemented through a grout string with 50 sacks of Class "A" cement. Dar-Way, Inc. ran a temperature survey from 95 feet below ground level (BGL) to surface at 25-foot increments and the cement top was located at the surface (Log No. 1).



A 17-1/2-inch hole was drilled below the 20-inch conductor casing to a depth of 405 feet RKB. Baker Atlas ran a Dual Induction Focused Log with Gamma Ray, (Log No. 2) a Compensated Z-Densilog, Compensated Neutron Log with Gamma Ray, (Log No. 3) and a 4-Arm Caliper Log with Gamma Ray (Log No. 4) on the open-hole interval. An Acoustic Cement Bond Log with Gamma Ray was run on the 20-inch conductor casing (Log No. 5).

The hole was cased with 9 joints (398.34 feet) of 13-3/8-inch, 48 lbs/ft, H-40 new casing set 396 feet with an insert float at 393 feet (Casing Detail, Attachment 4). Halliburton cemented the annulus with 75 sacks of Lite cement with 3% CaCl₂, followed by 150 sacks of Class "A" cement containing 3% CaCl₂. The top of the annulus was grouted from the surface with 175 sacks of Class "A" cement containing 3% CaCl₂ (Cementing Report, Attachment 5).

Dar-Way ran a temperature survey from 326 feet to the surface to verify the top of the cement at ground level (Log No. 6). The 13-3/8-inch casing was cut off and a 13-5/8-inch casinghead and blowout preventer was installed. The blowout preventer and casing was tested to 1000 psi for 20 minutes (Pressure Test Affidavit, Attachment 6).

The cement and float equipment was drilled out and a 12-1/4-inch hole was drilled to 825 feet. Baker Atlas ran a Dual Induction Focused Log with Gamma Ray (Log No. 7) and a Compensated Z-Density Log, Compensated Neutron Log, with Gamma Ray (Log No. 8) on the open hole. A segmented cement bond log with gamma ray was run on the 13-3/8-inch casing (Log No. 9).

The hole was cased with 19 joints (826.53 feet) of 9-5/8-inch, 36 lbs/ft casing set at 824 feet with an insert float at 790 feet (Casing Detail, Attachment 7). Halliburton cemented the annulus with 150 sacks of Lite cement containing 3% CaCl₂, followed by 200 sacks of Class "A" cement containing 3% CaCl₂ (Cementing Report, Attachment 8). Approximately 10 barrels of cement were circulated back to surface. Dar-Way ran a temperature survey, after 12 hours

waiting time, from 737 feet to surface to verify the cement top was at the surface (Log No. 10).

The 9-5/8-inch casing was cut off and an 11-inch, 3000-psi casinghead and blowout preventer were installed. The blowout preventers and casing were pressure tested to 1250 psi for 20 minutes (Pressure Test Affidavit, Attachment 9). The cement and float equipment was drilled out of the casing and an 8-3/4-inch hole was drilled to 1494 feet. Directional drilling tools and a downhole motor were run to directionally drill the well to the designated target west-southwest of the surface location (Directional Drilling Report, Attachment 10). Hole angle was increased to 20° from vertical, with an azimuth of 256° from north at a measured depth of 2372 feet. The hole was drilled to 3060 feet (measured depth) and cored from 3060 feet to 3090 feet, with 30 feet of recovery (Core Analysis, Attachment 11).

The core hole was reamed out and the well was deepened to 4156 (measured depth) for the second core. The hole angle was slowly reduced to 10.75° with the azimuth remaining at 256° from the north. Core No. 2 was cut from 4156 feet to 4186 feet, with 30 feet of recovery (Core Analysis, Attachment 11). The hole was drilled to a measured depth of 4645 feet, which corresponds to a true vertical depth of 4535 feet. The bottom-hole location was 211 feet south and 754 feet west of the surface location for 783 feet of departure.

Baker Atlas ran a Dual Laterolog, Micro Laterolog, with Gamma Ray (Log No. 11), a Compensated Z-Densilog, Compensated Neutron Log, with Gamma Ray (Log No. 12), a 4-Arm Caliper Log with Gamma Ray (Log No. 13), a Multipole Array Acoustilog, with Gamma Ray (Log No. 14), and a Circumferential Borehole Imaging Log with Gamma Ray (Log No. 15) on the open hole. A Segmented Cement Bond Log with Gamma Ray was run on the 9-5/8-inch casing (Log No. 16).

At the completion of logging, an open-hole bridge plug was run into the well and set at 4110 feet. The hole was filled with frac sand to 4067 feet in preparation for running casing. On December 20, 2001, the long-string injection casing was run