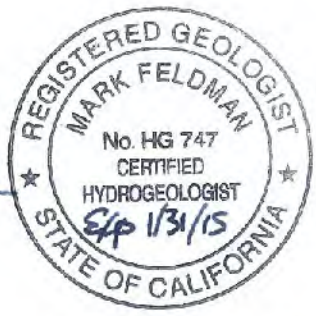
TETRA TECH

# Memorandum




**To:** Mr. Brian Thorne, Lockheed Martin Corporation
**From:** Mark Feldman, CHG CEG (CHG No. HG 747)
**Cc:** Daniel Zogaib, California Department of Toxic Substances Control
Greg Dellenbach, Riverside County Department of Environmental Health
Barbara Melcher, CDM Smith
Tom Villeneuve, Tetra Tech
**Date:** October 4, 2013
**Subject:** Well Destruction Report, Well TT-MW2-38C
Laborde Canyon (Lockheed Martin Beaumont Site 2)

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## Introduction

Well TT-MW2-38C is one of three nested wells located near Test Bay 3 at the Laborde Canyon site (Lockheed Martin Beaumont Site 2). Previous memoranda submitted to the California Department of Toxic Substances Control (DTSC) by Lockheed Martin (Tetra Tech 2012; Tetra Tech, 2013) reported that anomalously high perchlorate concentrations detected in TT-MW2-38C during routine groundwater monitoring were the result of a well casing leak. Based on the results of a dye tracer study presented in the most recent memorandum (Tetra Tech, 2013), the DTSC approved the destruction of well TT-MW2-38C in a letter dated June 27, 2013 (DTSC, 2013). The following memorandum documents the destruction of well TT-MW2-38C.

## Permitting

Prior to field work, a Well Drilling Permit for the destruction of monitoring well TT-MW2-38C was obtained from the County of Riverside Department of Environmental Health. Copies of the approved permit and the complete permit application are provided in Attachment A.

## Well Destruction Field Work

Field work was conducted on August 30, 2013. The well destruction was performed by National Exploration, Wells, and Pumps, Inc., a California C-57 licensed water well drilling contractor. The well destruction was observed by a Tetra Tech environmental scientist working under the direct supervision of a California-licensed Professional Geologist.

Field activities consisted of the following:

- Removing the dedicated sampling pump and associated tubing from the well.
- Covering the TT-MW2-38A and TT-MW2-38B wellheads with plastic sheeting to protect the wells from grout splashes during well destruction. These wells are located in the same protective housing as well TT-MW2-38C, and will continue to be used for groundwater monitoring in the future.
- Filling the casing of well TT-MW2-38C with high-solids portland cement/5% bentonite grout. The grout was placed from the bottom of the well using a tremie pipe. Groundwater displaced during placement of the grout was diverted into a 55-gallon drum and stored on-site in secondary containment, pending disposal.
- Placing a grout cap on the top of the well casing, and pressurizing the well to 45-55 pounds per square inch for a period of15 minutes.
- Topping off the well with additional grout to completely fill the well casing.

Photographs documenting field work are provided in Attachment B.

Approximately 45 gallons of grout were injected into TT-MW2-38C during well destruction. The volume injected was determined based on the difference between the volume of grout mixed (approximately 50 gallons) and the volume of grout remaining after well destruction was completed (approximately 5 gallons). For comparison, the approximate volume of the well casing, well screen, and filter pack of TT-MW2-38C is estimated to be 44.3 gallons, as shown in Table 1.

**Table 1**
**Estimated Well Volume**

| Item | Length (feet) | Inside Diameter (inches) | Porosity (fractional) | Volume (gallons) |
|---|---|---|---|---|
| Blank casing (Note 1) | 220 | 1.94 | 1 | 33.8 |
| Well screen (Note 2) | 10 | 2 | 1 | 1.6 |
| Filter Pack (Note 3) | 14 | 8 | 0.30 | 8.8 |
| **Total Estimated Volume:** | | | | **44.3** |

**Notes:**
1. Blank casing is 2-inch diameter Schedule 80 PVC
2. Well screen is 2-inch diameter 304 stainless steel wire-wrap
3. Borehole is 8 inches in diameter; filter pack is #2/16 sand

Within the likely error of measurement, the volume of grout injected during well destruction (approximately 45 gallons) was sufficient to completely fill the well casing, screen, and filter pack of well TT-MW2-38C.

A copy of the California Department of Water Resources Form 188 completed by the C-57 licensee for the well abandonment is provided in Attachment 3.

## Future Groundwater Monitoring

Existing well TT-MW2-30C, located approximately 240 feet downgradient from TT-MW2-38C, is screened at similar depth interval similar to TT-MW2-38C. Future groundwater monitoring events at Laborde Canyon will include sampling of well TT-MW2-30C in lieu of TT-MW2-38C.

## References

Tetra Tech, 2012. *Evaluation of Anomalous Perchlorate Concentrations in Monitoring Well TT-MW2-38C, Laborde Canyon (Lockheed Martin Beaumont Site 2).* Memorandum dated August 15, 2012.

Tetra Tech, 2013. *Video Survey of Monitoring Well TT-MW2-38C, Laborde Canyon (Lockheed Martin Corporation Beaumont Site 2).* Memorandum dated April 29, 2013.

DTSC, 2013. *Video Survey of Monitoring Well TT-MW2-38C, Lockheed Martin Corporation, Beaumont Site 2, Beaumont, California (Site Code: 400261).* Letter to Mr. Brian T. Thorne dated June 27, 2013.

## Attachments

Attachment 1: Approved Well Permit and Well Permit Application
Attachment 2: Photographic Documentation

# Attachment 1

# Approved Well Permit and Well Permit Application

COUNTY OF RIVERSIDE

# DEPARTMENT OF ENVIRONMENTAL HEALTH

## WELL DRILLING PERMIT

**WP#:** **WP0023589**

ALL ELECTRICAL, PLUMBING, MECHANICAL, AND STRUCTURAL REPAIRS AND INSTALLATIONS SHALL BE DONE UNDER PERMIT FROM RIVERSIDE COUNTY DEPT. OF BUILDING AND SAFETY.

Approved Date : 08/16/2013

Expiration Date : 02/16/2014

Fee : $ 151.00
(Non-Refundable)

This permit is granted on condition that the person named in the permit will comply with the laws, ordinances and regulations that are now or may hereafter be in force. (This is not a permit to operate a water system.)

**APN:** 421-080-001 Sec. 18 ; T 3S ; R 1W

PERMIT DESCRIPTION : Well Abandonment

PHYSICAL ADDRESS/LOCATION OF WELL : La Borde Canyon Rd Beaumont, CA
TT-MW2-38

OWNER : Riv. Co. Waste Management Department
14310 Frederick Street
Moreno Valley CA 92553-

DRILLER : National Exploration Wells and P
COUNTY REGISTRATION # : PI0000339
PHONE # : (909) 931-4014

**Note: It is the owner's responsibility to verify that a Driller's C-57 license is current with the California Contractors State Licensing Board.**

Rpt. 5556, ver: 02/12

**Distribution: Environmental Health ; Owner; Well Driller; Consultant**

RIVERSIDE COUNTY COMMUNITY HEALTH AGENCY
DEPARTMENT OF ENVIRONMENTAL HEALTH

# WELL PERMIT APPLICATION

4080 Lemon Street • 2nd Floor • P.O. Box 1280 • Riverside • CA • 92502 – (951) 955-8980
☐ 47-950 Arabia Street • Suite A • Indio • CA 92201 – (760) 863-7570

PLEASE REPLY TO ADDRESS CHECKED ABOVE

**DEH USE ONLY**
Permit No. WP 23589
Expiration 2-14-14
EHW No. 130243

**OWNER**
Name County of Riverside Waste Management Department
Mailing Address 14310 Frederick Street
City Moreno Valley State CA
Zip 92553 Phone No. ( 951 ) 486-3261
E-mail tshibata@co.riverside.ca.us ☐ N/A

**SITE ADDRESS** La Borde Cyn. Rd
City Beaumont ☐ RCDEH-LOP Site
APN 421-080-001
Township 3S Range 1W Section 18
Wellhead GPS Coordinates (WGS-84 Decimal Degrees):
33.907301 LAT / -117.031131 Long
**Provide Plot Plan & Vicinity Map on Attachment #2**

**WELL DRILLER**
Name National Exploration Wells and Pumps
Phone ( 909 ) 931-4014
E-mail joconnor@nationalewp.com ☐ N/A
Riv. Co. Registration No. 10000-339
C-57 License No. 953646

**CONSULTANT**
Name Tetra Tech, Inc.
Address 301 E. Vanderbilt Way Suite 450 City San Bernardino
State CA Zip 92408 Phone ( 909 ) 381-1674
E-mail mark.feldman@tetratech.com ☐ N/A

**DATE OF WORK**
Start 8/30/2013 Complete 8/30/2013

**TYPE OF WORK** (check)
☐ New ☐ Reconstruction ☒ Destruction
**Describe reconstruction or destruction method on Attachment 1**

**WELL TYPE** (check)
☐ Community ☒ Monitoring
☐ Agricultural ☐ Individual ☐ Cathodic
☐ Industrial ☐ Horizontal ☐ Sparge
☐ Other
Type of rig N/A

**UPPER ANNULAR SPACE SEAL**
Depth 179 ft.
Borehole Diam. 8 In.
Conductor Diam. NA In.
Annular Thickness 35 in.
Sealing Material Hydrated Bentonite

**DEPTH OF WELL** (feet)
Proposed NA Existing 227
Diameter of Bore (in.) 10" / 8"

**WELL CASING** (See attached Well Construction Diagram)
☐ Steel ☒ PVC ☐ Other

| From (ft.) | To (ft.) | Dia. (in.) | Wall (Gage) |
|---|---|---|---|
| 0 | 227 | 2 | SCH 80 |

GRAVEL PACK ☒ Yes ☐ No
From 214 to 228 ft.

**PERFORATIONS** (if applicable)
From 217 to 227 ft.

**SEALED ZONES** (if applicable)
From NA to NA ft.

000001
LOR10001
$151.00
$3.02
CHECK
$154.02

I have read this application and agree to comply with all laws regulating the type of work being performed.
Driller's Signature Jeffrey P. O'Connor Date 8/13/13

I declare under penalty of perjury under the laws of the State of California that the information furnished as part of this application is true and correct. I also understand that I am legally obligated to obey all requirements of state law and Riverside County Ordinances in connection with the approval of this application.
Property Owner's Signature [signature] Date 8/12/13

**DISPOSITION OF PERMIT**
**DEH USE ONLY**

☒ **Approved** ☐ **Denied**

Notify the Department 48 hours in advance to make an inspection of the Following operations:
☒ Prior to sealing of the annular space or filling of the conductor casing.
☐ After installation of the surface protective slab and pumping equipment.
☒ During destruction of wells, prior to pouring the sealing material.

Submit to the Department within thirty (30) days after completion of work, a copy of **Water Well Driller's Report (DWR 188)**

NOTE: Properties located within an Adjudicated Basin or within Water District boundaries may be subject to restriction or usage as determined by the Water Master or District agreements.

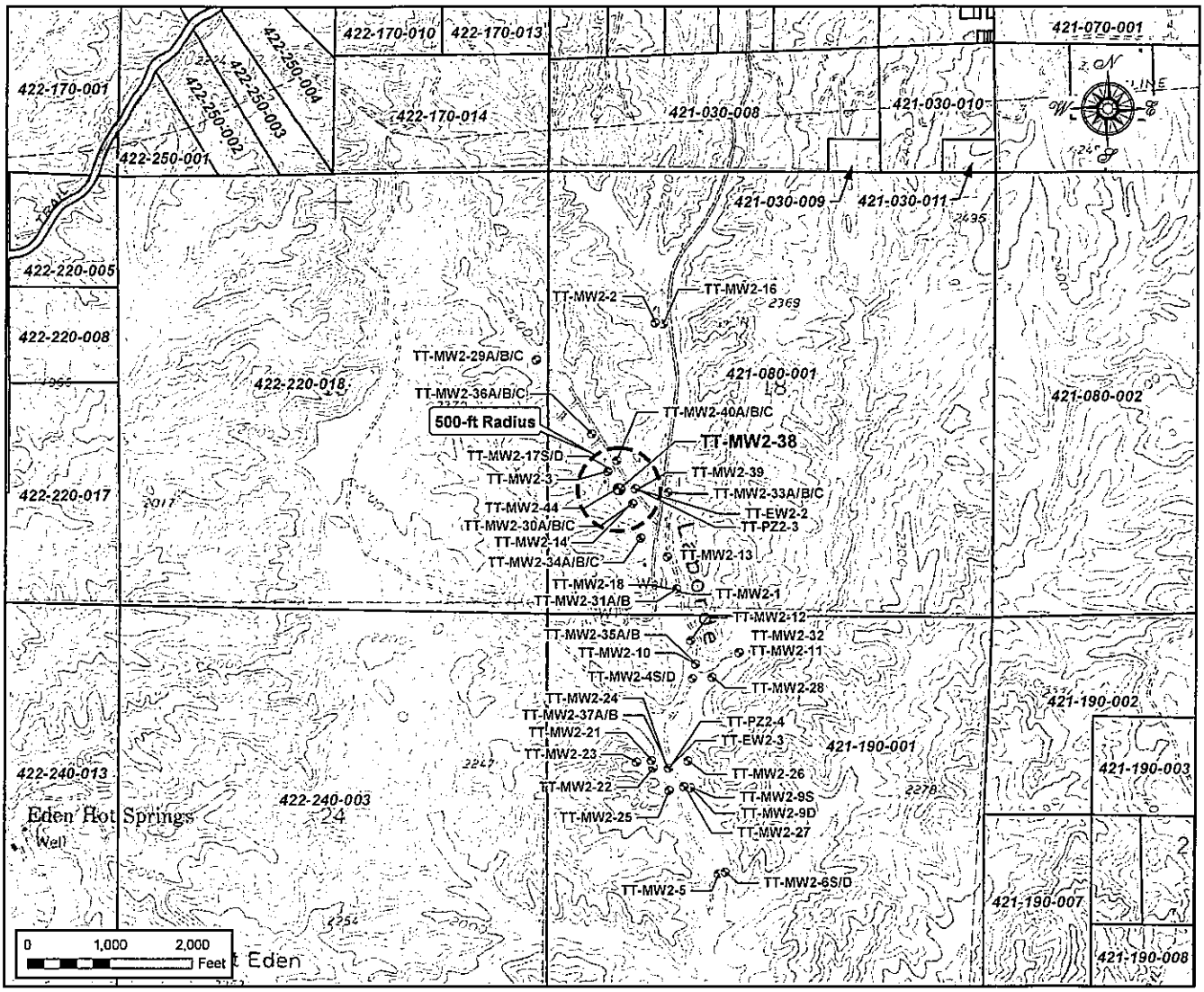
Other: Arrangement to be made w/DEH staff to meet @ gate and piloted to site.
Specialist: [signature] Date: 16 Aug 2013

**ATTACHMENT NO. 2**

## COUNTY OF RIVERSIDE COMMUNITY HEALTH AGENCY
## DEPARTMENT OF ENVIRONMENTAL HEALTH

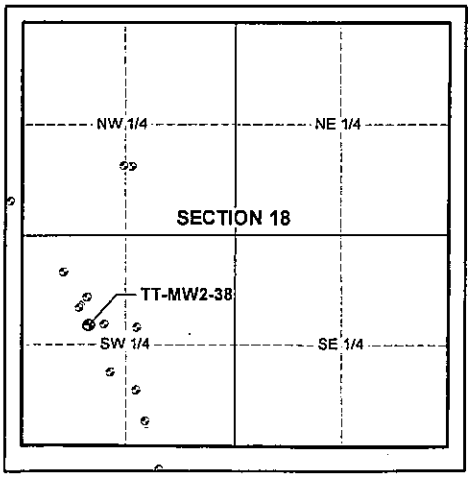
421-080-001
Assessor's Parcel Number

## PLOT PLAN

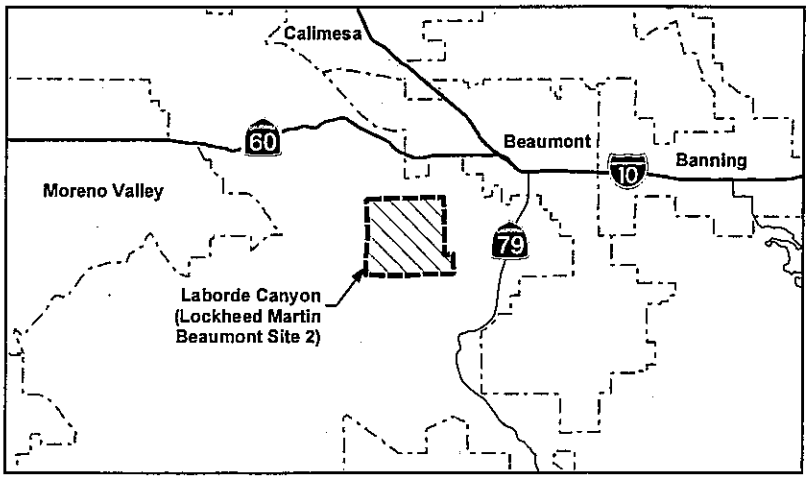



Note: No sewage or waste disposal systems or underground tanks within 500 feet.

SECTION MAP




VICINITY MAP



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## Attachment No. 1

## Background Information

The monitoring well to be abandoned (TT-MW2-38C) is one of three nested wells completed in a single borehole (see attached well construction diagram). The nested wells were installed in 2009 under a single well permit (Permit No. 34341, issued September 12, 2008).

Based on chemical data collected during routine groundwater monitoring, and the results of a dye tracer test and video survey, the casing for TT-MW2-38C well was found to be leaking. Destruction of TT-MW2-38C is proposed to eliminate potential cross-connection of shallow and deep groundwater. The other two wells in the nest (TT-MW2-38A and TT-MW2-38B) are intact, and continue to be usable for their intended purpose.

Because the wells were installed under a single permit, we propose to obtain one permit for the destruction of TT-MW2-38C. Additional well destruction permits will be obtained for TT-MW2-38A and TT-MW2-38B when these wells are destroyed in the future. Because wells TT-MW2-38A and TT-MW2-38B will continue to be used, the method proposed for destruction does not include removal of the upper five feet of well casing or placement of grout above the top of the destroyed well. These activities will be performed during future destruction of wells TT-MW2-38A and TT-MW2-38B.

## Proposed Well Destruction Method

1. Completely fill well casing with grout (portland cement with 5% bentonite added) to displace standing water in well. Grout will be placed from bottom of well using tremie pipe. Displaced water will be collected for proper disposal.

2. Install grout cap on well; pressurize to 45 psi with grout pump for 15 minutes.

3. Top off with grout as needed to fill well casing.

Note: Well casing will be left in place pending destruction of the other two wells in nest.

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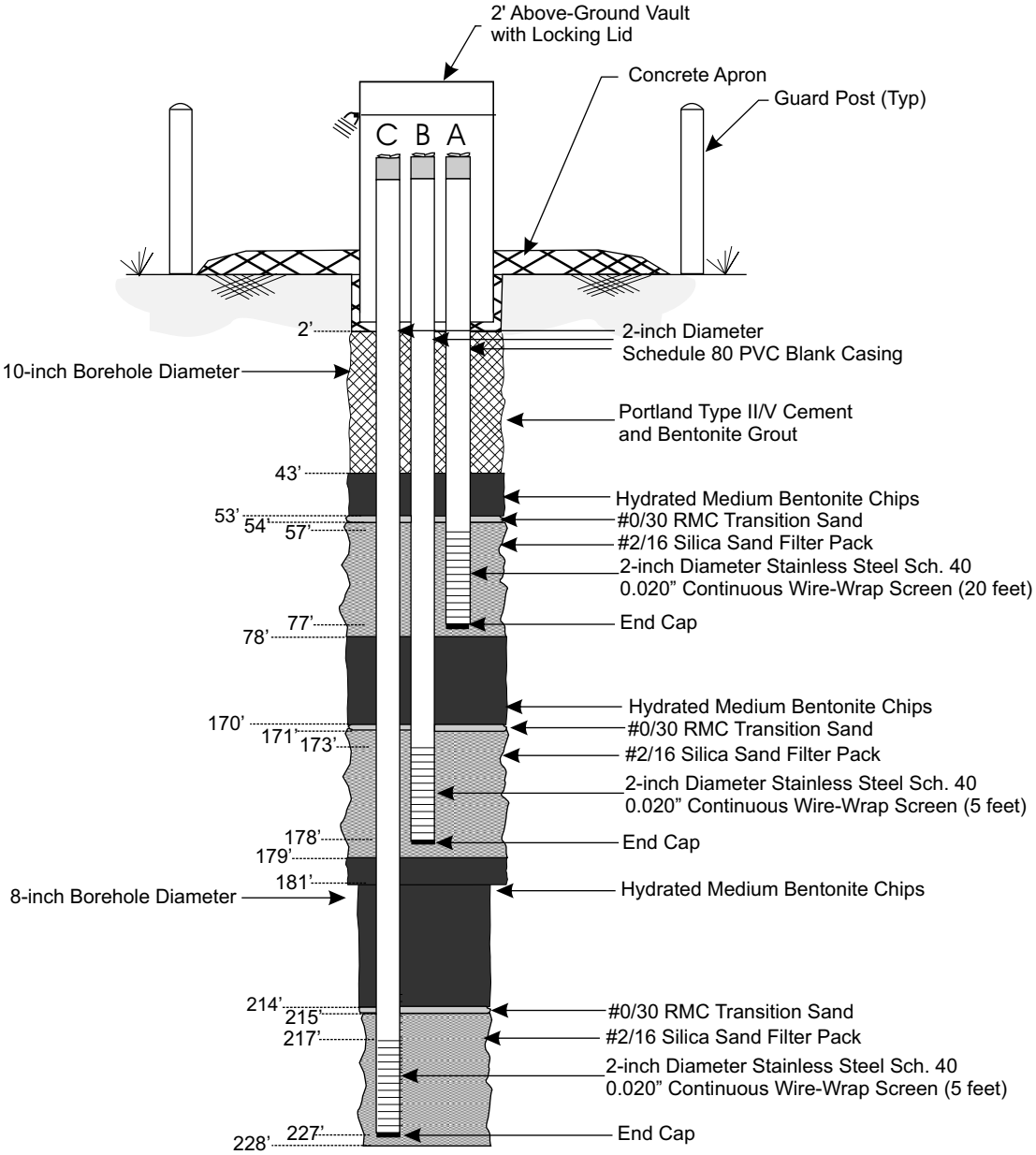


Note: Not to Scale

Beaumont Site 2

**TT-MW2-38 A/B/C**
**Well Construction Diagram**

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# Attachment 2

# Photographic Documentation

Photo No. 1: Drill rig set up on TT-MW2-38C in preparation for well destruction.

Photo No. 2: Close up of wellhead prior to placing grout. Horizontal pipe is used to divert displaced groundwater into a 55-gallon drum.

Photo No. 3: Close up of the TT-MW2-38C well casing after well destruction.

**Attachment 3**

**California Department of Water Resources**
**Form 188**

*The free Adobe Reader may be used to view and complete this form. However, software must be purchased to complete, save, and reuse a saved form.

File Original with DWR

State of California

# Well Completion Report

*Refer to Instruction Pamphlet*

No. e0188701

Page 1 of 1

Owner's Well Number TT-MW2-38C

Date Work Began 08/30/2013 Date Work Ended 8/30/2013

Local Permit Agency County of Riverside

Permit Number WP0023589 Permit Date 8/16/13

**DWR Use Only – Do Not Fill In**

State Well Number/Site Number

Latitude N Longitude W

APN/TRS/Other

## Geologic Log

Orientation ◉ Vertical ○ Horizontal ○ Angle Specify

Drilling Method Hollow Stem Auger Drilling Fluid

| Depth from Surface Feet | to Feet | Description Describe material, grain size, color, etc |
|---|---|---|
| | | WELL DESTRUCTION |
| | | Pressure grout 2" well from 227' to surface . Grout |
| | | was placed from bottom of well using tremie pipe. |

Total Depth of Boring Feet

Total Depth of Completed Well Feet

## Well Owner

Name Riverside Waste Management Department

Mailing Address 14310 Frederick Street

City Moreno Valley State CA Zip 92553

## Well Location

Address La Borde Canyon Road

City Beaumont County Riverside

Latitude Deg. Min. Sec. N Longitude Deg. Min. Sec. W

Datum Decimal Lat. Decimal Long.

APN Book 421 Page 080 Parcel 001

Township 3S Range 1W Section 18

## Location Sketch

(Sketch must be drawn by hand after form is printed.)

North

West East

South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

## Activity

○ New Well
○ Modification/Repair
  ○ Deepen
  ○ Other
◉ Destroy
  Describe procedures and materials under "GEOLOGIC LOG"

## Planned Uses

○ Water Supply
  ☐ Domestic ☐ Public
  ☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other

## Water Level and Yield of Completed Well

Depth to first water (Feet below surface)

Depth to Static Water Level (Feet) Date Measured

Estimated Yield * (GPM) Test Type

Test Length (Hours) Total Drawdown (Feet)

*May not be representative of a well's long term yield.

## Casings

| Depth from Surface Feet | to Feet | Borehole Diameter (Inches) | Type | Material | Wall Thickness (Inches) | Outside Diameter (Inches) | Screen Type | Slot Size if Any (Inches) |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |

## Annular Material

| Depth from Surface Feet | to Feet | Fill | Description |
|---|---|---|---|
| 0 | 227 | Cement | |

## Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☑ Other Site Map

Attach additional information, if it exists.

## Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name National EWP, Inc
Person, Firm or Corporation

5566 Arrow Highway Montclair CA 91763
Address City State Zip

Signed for National EWP. 10/2/13 953646
C-57 Licensed Water Well Contractor Date Signed C-57 License Number

DWR 188 REV. 1/2006

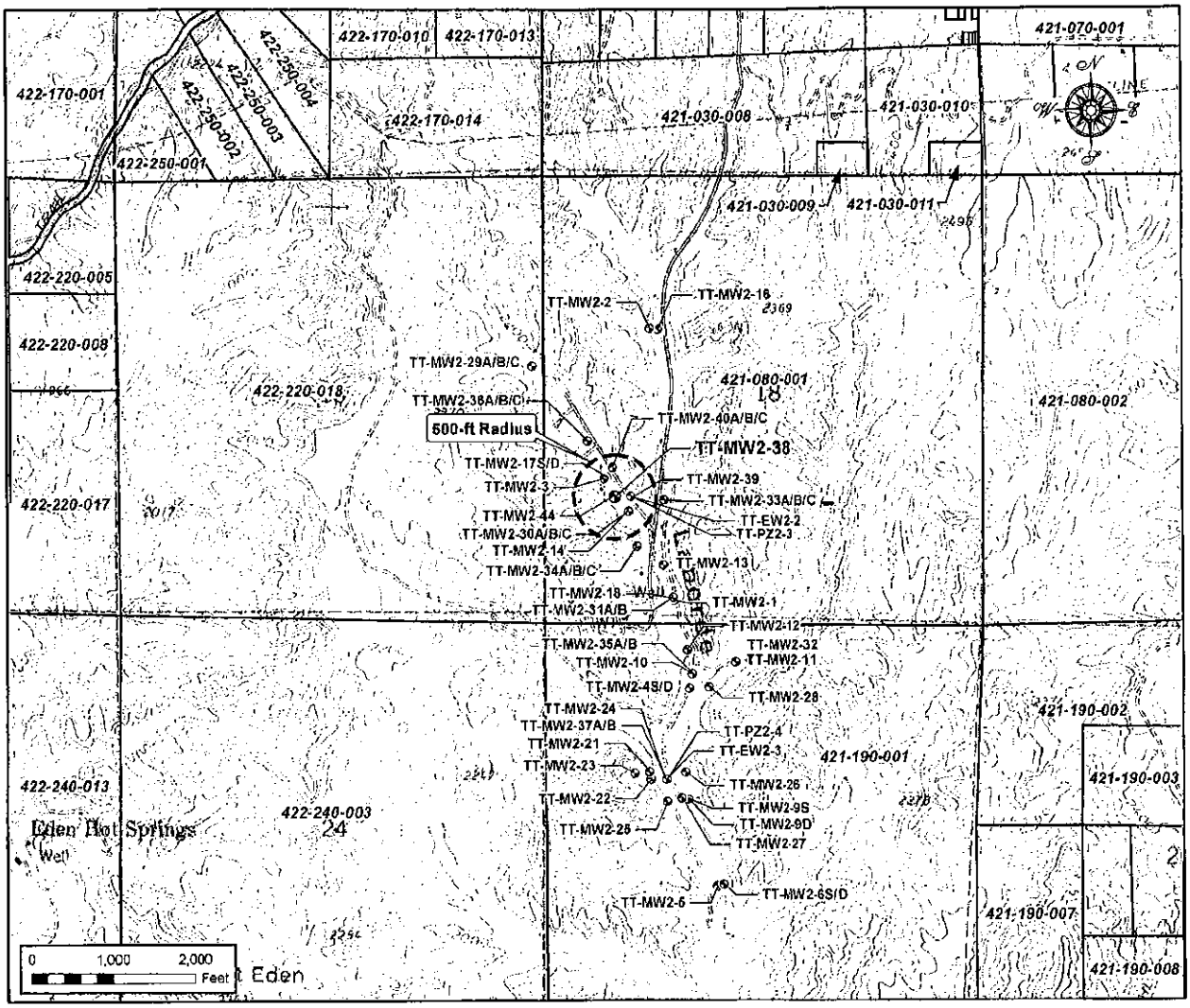
IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

**ATTACHMENT NO. 2**

**COUNTY OF RIVERSIDE COMMUNITY HEALTH AGENCY**
**DEPARTMENT OF ENVIRONMENTAL HEALTH**

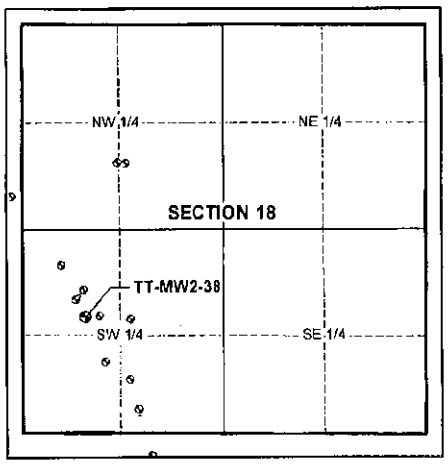
421-080-001
Assessor's Parcel Number

## PLOT PLAN




**Note:** No sewage or waste disposal systems or underground tanks within 500 feet.

SECTION MAP

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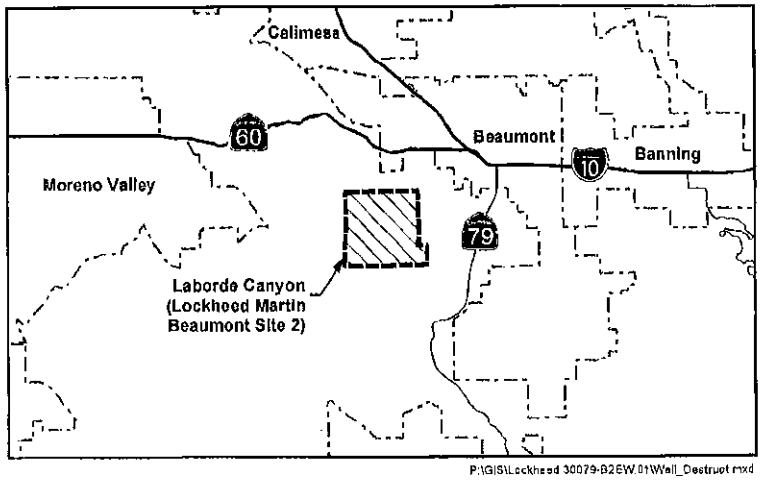




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