NM1 - 30

MODIFICATION SITE ASSESSMENT

2008-2009

New Mexico Energy, Minerals and Natural Resources Department

Bill Richardson
Governor

Joanna Prukop
Cabinet Secretary
Reese Fullerton
Deputy Cabinet Secretary

Mark Fesmire
Division Director
Oil Conservation Division

May 4, 2009

Mr. Jim Wilson
Artesia Aeration
P.O. Box 310
Hobbs, New Mexico 88241

RE: Request for Additional Information - Surface Waste Management Facility Landfill Permit Application Review
Artesia Aeration: Permit NM-1-0011
Location: Sections 5, 6, and 7, Township 17South, Range 32 East, NMPM
Lea County, New Mexico

Dear Mr. Wilson:

The Oil Conservation Division (OCD) has reviewed Artesia Aeration's surface waste management facility permit application for a new commercial landfill, dated January 5, 2009 and received by OCD on January 26, 2009 and ground water report and drawings received by OCD on August 4, 2008. The review of the submittals is to determine if any additional information or modifications may be required before considering deeming the permit administratively application complete. The submittal has been determined to be incomplete. Therefore, the OCD requests additional information.

Enclosed is a list of items that must be addressed prior to completing the review. Once this information is submitted, the OCD will determine if additional information is required. The OCD recommends that all corrections, additions, and modifications to the application be reviewed and cross-referenced before they are submitted, in order to verify that all responses correlate and coincide with each other throughout the application. Any and all general statements in the permit application and appendices are required to be supported by a citation of publication.

The OCD recommends that Artesia Aeration and your consultant (hydrologist/geohydrologist) schedule a meeting with OCD to establish a plan to properly characterize the geology and groundwater beneath the area proposed landfill prior to taking any further action. The goal is to

establish an assessment plan that will provide the appropriate information to determine if the proposed site is viable. If the site is determined to be viable, the OCD recommends that Artesia Aeration and your consultant schedule another meeting to discuss the deficiencies of the application, in order for OCD to provide instruction on how they should be addressed.

If there are any questions regarding this matter, please do not hesitate to contact me at (505) 476-3487 or brad.a.jones@state.nm.us.

Sincerely,

Brad A. Jones
Environmental Engineer

BAJ/baj

Attachment – Request for Additional Information

cc: OCD District I Office, Hobbs

Request for Additional Information
For The Artesia Aeration Commercial Landfill
Surface Waste Management Facility Permit Application
May 4, 2009

Any and all general statements in the permit application and appendices must be supported by a citation of publication. Please provide and reference.

APPLICATION:

Form C-137, Item 5:

The Surface Owner map provided in the application illustrates that the proposed landfill area is only in Section 7 of Township 17 South, Range 32 East, NMPM, of Lea County New Mexico and not in Sections 5 and 6 as indicated on the form. This is also supported by the topographic survey map provided in the Groundwater Investigation Report (submitted by Safety & Environmental Solutions, Inc.) received by OCD on August 4, 2008. Please provide the correct legal description for the proposed facility and identify the quarter-quarter section(s) or unit letter designation(s) for Section 7.

Form C-137, Item 8:

Paragraph (2) of Subsection C of 19.15.36.8 NMAC requires the applicant to provide "a plat and topographic map showing the surface waste management facility's location in relation to governmental surveys (quarter-quarter section, township and range); highways or roads giving access to the surface waste management facility site; watercourses; fresh water sources, including wells and springs; and inhabited buildings within one mile of the site's perimeter." Please provide a plat and topographic map showing watercourses; fresh water sources, including wells and springs; and inhabited buildings within one mile of the *site's perimeter*.

Form C-137, Item 9:

Paragraph (3) of Subsection C of 19.15.36.8 NMAC requires the applicant to provide "the names and addresses of the surface owners of the real property on which the surface waste management facility is sited and surface owners of the real property within one mile of the site's perimeter." The Surface Owner map provided in the application does not illustrate any of the surface owners within one mile west of the site's perimeter or of Section 7. Please identify all surface owners within one mile of the site's perimeter.

Form C-137, Item 10:

Paragraph (4) of Subsection C of 19.15.36.8 NMAC requires the applicant to provide "a description of the surface waste management facility with a diagram indicating the location of fences and cattle guards, and detailed construction/installation diagrams of pits, liners, dikes, piping, sprayers, tanks, roads, fences, gates, berms, pipelines crossing the surface waste management facility, buildings and chemical storage areas." Please reference the location of or provide the description of the surface waste management facility with a diagram indicating the location of fences and cattle guards. Since this a separate facility from the landfarm, please reference the location of or provide detailed construction/installation diagrams of dikes, piping, tanks, roads, fences, gates, berms, buildings and chemical storage areas in regards to the proposed landfill facility.

Form C-137, Item 11:

The enlarged landfill design drawings illustrate and suggest that the proposal is for a single landfill cell. Information and drawings provided in the application and the groundwater investigation report (submitted by Safety & Environmental Solutions, Inc.) received by OCD on August 4, 2008, suggest that there will be multiple landfill cells within the proposed surface waste management facility boundary. Please clarify the extent of the proposal. If additional landfill cells are proposed, please provide the design for each cell and illustrate its location in relationship to all other cells.

The engineering design drawings should also illustrate the landfill area(s) at final closure. Such drawings would illustrate the installation of the final cover with elevations of the proposed final design height and exterior side slopes Please provide the final design drawings and appropriate cross-sections. Also, please provide the technical data in regards to the design elements of the landfill as required in 19.15.36.14 NMAC.

Form C-137, Item 12:

The Management Plan provided in the application does not address all of the applicable requirements regarding the management of waste contained in 19.15.36.13 NMAC and 19.15.36.14 NMAC.

Form C-137, Item 13:

The Management Plan provided in the application does not address all of the applicable requirements of Subsection L of 19.15.36.13 NMAC.

Form C-137, Item 14:

The H2S Contingency Plan provided in the application does not address all of the applicable requirements of 19.15.11 NMAC.

Form C-137, Item 15:

The Closure Plan provided in the application does not address all of the applicable closure and post-closure requirements of 19.15.36.18 NMAC.

Form C-137, Item 16:

The Contingency Plan provided in the application does not address all of the applicable requirements of Subsection N of 19.15.36.13 NMAC.

Form C-137, Item 17:

The Management Plan provided in the application does not address all of the applicable requirements of Subsection M of 19.15.36.13 NMAC.

Form C-137, Item 18:

OCD was unable to locate a leachate management plan in the application. Please provide.

Form C-137, Item 19:

OCD was unable to locate a gas safety management plan in the application. Please provide.

Form C-137, Item 20:

OCD was unable to locate a best management practice plan in the application: Please provide.

Form C-137, Item 21:

OCD was unable to locate demonstrations of compliance to the siting requirements of Subsections A and B of 19.15.36.13 NMAC in the application. Please provide.

Form C-137, Item 22:

OCD was unable to locate items (b) through (g) in the application packet. Please provide.

SURFACE OWNERS:

The Surface Owner map does not illustrate any of the surface owners within one mile west of the site's perimeter or of Section 7. Please identify all surface owners within one mile of the site's perimeter.

SITE DESCRIPTION:

Any and all general statements in the permit application and appendices must be supported by a citation of publication or supporting documentation. Please provide and reference.

The first sentence of the first paragraph states, that the proposed facility is "one point two (1.4) miles west of Maljamar, New Mexico." Please clarify if the proposed facility is 1.2 or 1.4 miles west of Maljamar and support the assessment by providing and/or referencing a map that illustrates and demonstrates the distance of only the proposed landfill facility.

The first sentence of the second paragraph states "Artesia Aeration is located on sections 5, 6, 7, of township 17S and range 13E..." The information provided on the C-137 Form indicates that the proposed landfill will be a new surface waste management facility, separate of the Artesia Aeration Landfarm facility. If the information provided on the C-137 Form is correct, the enlarged landfill design drawings illustrate that the proposed facility will only be located within Section 7 of Township 17 South, Range 32 East, NMPM, of Lea County, New Mexico. Please reference a drawing or map that supports the location description of the proposed landfill facility. The second sentence of the second paragraph states that Artesia Aeration "consists of 167.856 acres..." Due to the consistency of referencing the existing landfarm and the proposed landfill together throughout the permit application, it difficult to determine if the 167.856 acres represents only the proposed landfill or the landfill and landfarm area combined. Please clarify and provide a map or drawing that demonstrates, illustrates, and indicates the total acreage of the proposed landfill facility.

There are at least two general statements in the second paragraph that mentions the proposed site satisfies the siting requirements of 19.15.36.13 NMAC. These statements remain unfound until supporting documentation is provided to demonstrate compliance. Please provide and reference the location of the supporting documentation that demonstrates compliance with the siting requirements of Subsections A and B of 19.15.36.13 NMAC.

Based upon the format of the application, it is OCD's interpretation that this section, *Site Description*, of the application is provided to comply with the requirements of Paragraph (4) of Subsection C of 19.15.36.8 NMAC and the information requested for Item 10 on the C-137

application form. Paragraph (4) of Subsection C of 19.15.36.8 NMAC requires the applicant to provide "a description of the surface waste management facility with a diagram indicating the location of fences and cattle guards, and detailed construction/installation diagrams of pits, liners, dikes, piping, sprayers, tanks, roads, fences, gates, berms, pipelines crossing the surface waste management facility, buildings and chemical storage areas." The information provided in this section does not completely satisfy the specified items listed above. Please provide the appropriate information and/or reference the location of any supporting documentation.

The "References" provided at the bottom of the page are not appropriate for the information provided in this section and are not properly utilized. Please cite the specific pages within the "Ground-water Conditions in Northern Lea County, New Mexico" publication that support specific information provided in this section and provide an appropriate footnote. The water well records on file with the New Mexico Office of the State Engineer provide water well records for the entire state. Please provide the results of a records search in regards to the vicinity of the proposed facility location. The water well records on file with U.S.G.S provide water well records for the nation. Please provide the results of a records search in regards to the vicinity of the proposed facility location. Please provide the appropriate footnotes to information or statements provided in this section regarding the water well results and information or statements based upon information obtained from the Lea County Courthouse Public Records Department. Please provide a copy of the information obtained from the Lea County Courthouse Public Records Department.

PIT DESIGN:

The first paragraph in this section provides design dimensions for the proposed landfill cell. The design dimensions do not coincide with the engineer drawings received by OCD on August 4, 2008. Please clarify.

The written text in this section does not demonstration compliance or provided all of the information required in Subsections C, D, E, F, and G of 19.15.36.14 NMAC. Please demonstrate compliance with all of the appropriate requirements.

Please provide engineering design drawings that illustrate each and all of the proposed landfill cells and the landfill area(s) at final closure. Such drawings would illustrate the installation of the final cover with elevations of the proposed final design height and exterior side slopes and identify the design capacity of each landfill cell or the complete landfill disposal area. Please provide the final design drawings and appropriate cross-sections.

MANAGEMENT PLAN:

Part 1: The first sentence states that the depth to ground water "is in excess of 100 feet as displayed by monitoring drilled at location..." As reported in the Groundwater Investigation Report (submitted by Safety & Environmental Solutions, Inc. and received by OCD on August 4, 2008) of the application, only two monitoring wells have been installed within the proximity of the proposed landfill, MW-2 and MW-3. The report continues to confirm that the depth to ground water in MW-2 is 25.58 feet below the top of casing, which is 22.4 feet below the ground surface or at an elevation of 3990.02 feet above mean sea level. The second sentence states that "no ground water is located 50 foot below the lowest level of the disposal area in compliance with 19.15.36.13 NMAC section a.5." The depth to ground water siting criteria for a landfill, Paragraph (1) of Subsection A of 19.15.36.13 NMAC, states "no landfill shall be located where ground water is less than 100 feet below the lowest

elevation of the design depth at which the operator will place oil field waste." Based upon the statements provided in Part 1 of this section regarding ground water, there is an indication that the ground water separation requirement is not completely understood. Please readdress the compliance issues regarding ground water separation requirement and reference the supporting documentation of the assessment that is provided in the application. Also, please clarify if one single landfill cell, as current demonstrated, is proposed or if several landfill cells are proposed. If the latter, several landfill cells, is proposed, please provide a design drawing for each cell with design elevations and illustrate its placement or location in relationship to the proposed facility site.

Also, please provide a demonstration of compliance for each of the siting criteria identified in Subsection B of 19.15.36.13 NMAC.

Part 2: Please state the acreage of the proposed landfill facility and reference a drawing that confirms and demonstrates the specified size.

Part 3: Pursuant to Subsection E of 19.15.36.13 NMAC, the "operator shall not place oil field waste containing free liquids in a landfill." The consideration of the acceptance of waste fluids is not an option for landfill operators under 19.15.36 NMAC.

Part 4: The waste acceptance protocols provided in this section do not address all of the applicable requirements of Subsection F of 19.15.36.13 NMAC. The requirements state that "the operator shall not accept hazardous waste at a surface waste management facility." The acceptance protocols for exempt and non-exempt, non-hazardous oilfield wastes provided in the application are incomplete and do not coincide with the regulatory language of 19.15.36 NMAC. Please address.

Part 5: Please reference the provision within 20.3.14 NMAC that supports the proposed radiation survey criteria of "more than 30 picocuries above background."

Part 7: Please identify the acceptance limits in which "all material must be below."

Part 8: Please address all of the regulatory requirements pursuant to Paragraph (3) of Subsection F of 19.15.36.13 NMAC regarding the conditions and protocols of the acceptance of emergency non-oil field waste.

Part 9: The operational procedures provided in this section do not address all of the applicable requirements of 19.15.36 NMAC. The record keeping requirements of Subsection G of 19.15.36.13 NMAC are incomplete and do not coincide with the regulatory language of 19.15.36 NMAC. A template of the waste manifest must be submitted in the application in order to demonstrate compliance with 19.15.36 NMAC. The specific operational requirements applicable to landfills of Subsection A of 19.15.36.14 NMAC are not addressed in the application. Ground water monitoring, closure of individual cells in regards to operational and landfill development, and operations of the landfill gas control system and leachate collection system are not discussed in the application. Please address all applicable operational requirements.

Part 10: In information provided in this part seems to be an attempt to address the requirements of Subsections L and M of 19.15.36.13 NMAC. Please review the regulatory language provided in Paragraphs (1) through (3) of Subsection L of 19.15.36.13 NMAC to ensure that all of

the requirements are addressed as required by the regulations. Also, please address the additional inspection and maintenance requirements of 19.15.36.14 NMAC regarding the intermediate cover, final cover, vegetation, liner system, leachate collection system, and landfill gas control system.

H2S CONTINGENCY PLAN:

The first paragraph in this section states "Artesia Aeration is applying or a solid waste permit." The OCD permits surface waste management facilities under 19.15.36 NMAC. The Solid Waste Bureau of the New Mexico Environment Department permits solid waste landfills. Please utilize the correct terminology to prevent confusion regarding the type of permit that is being requested.

The H2S prevention and contingency plan is required to comply with the applicable provisions of 19.15.11 NMAC regarding surface waste management facilities. The information provided in the application is incomplete and does not provide all of the information and documents identified in Section 9 (Hydrogen Sulfide Contingency Plan) of 19.15.11 NMAC. The plan also does not address the requirements of 19.15.11.13 NMAC (Personnel Protection and Training), 19.15.11.14 NMAC (Standards for Equipment That May Be Exposed to Hydrogen Sulfide), and 19.15.11.16 NMAC (Notification of The Division). Please review the requirements of 19.15.11 NMAC and provide the required information.

CLOSURE PLAN:

This section should be re-titled "Closure and Post-Closure Care Plan" since 19.15.36 NMAC requires operators of landfills to provide 30 years of post-closure care. The closure plan does not identify the closure notice requirements identified in 19.15.36.14 NMAC and 19.15.36.18 NMAC. It also proposes a landfill cover design that does not satisfy the requirements of Paragraph (8) of Subsection C of 19.15.36.14 NMAC and does not demonstrate compliance with the additional cover design requirements and re-vegetation requirements of 19.15.36.18 NMAC. The ground water monitoring proposal in the second paragraph of the section does not comply with specific requirements Subparagraph (b) of Paragraph (3) of Subsection D of 19.15.36.18 NMAC. The post-closure portion of this section does not address the additional requirements of Subparagraph (a) of Paragraph (3) of Subsection D of 19.15.36.18 NMAC. Please address the closure requirements identified in 19.15.36.14 NMAC and 19.15.36.18 NMAC and the post-closure requirements identified in 19.15.36 18 NMAC.

Pursuant to Paragraph (9) of Subsection C of 19.15.36.8 NMAC, the permit application shall include "a closure and post closure plan, including a responsible third party contractor's cost estimate, sufficient to close the surface waste management facility in a manner that will protect fresh water, public health, safety and the environment (the closure and post closure plan shall comply with the requirements contained in Subsection D of 19.15.36.18 NMAC)." The financial cost estimate and supporting documentation in the application are incomplete and do not represent compliance with the closure and post-closure requirements of 19.15.36 NMAC. There are no costs estimates for the materials, testing, and installation of the required geomembrane liner portion of the final cover or the size of the area that requires final cover. Based upon the design drawings and the prescribed design requires specified within 19.15.36.14 NMAC and 19.15.36.18 NMAC, the final cover will also include the installation of four different layers of soils of a minimum total of four feet of soil, each with specific characteristic parameters and each with specific installation requirements. The estimate provided by Sweatt Construction Inc. does not demonstrate acknowledgement or

understanding of the requirements pertaining to the distinct soil layers and the installation of the soil component of the final cover. It also proposes that the re-vegetation of "approximately 50 acres" will be completed at the same time, which is contrary to the requirements Paragraphs (7) and (8) of Subsection A of 19.15.36.14 NMAC and Paragraph (2) of Subsection D of 19.15.36.18 NMAC. The financial estimate provided by Safety & Environmental Solutions, Inc. regarding ground water monitoring is based upon some the operational requirements identified in Paragraph (2) of Subsection L of 19.15.36.13 NMAC and Subsection B of 19.15.36.14 NMAC. It does not demonstrate compliance to all of the requirements or address the additional maintenance and monitoring required in Subparagraphs (a) and (b) of Paragraph (3) of Subsection D of 19.15.36.18 NMAC. Also, the estimate provided by Safety & Environmental Solutions, Inc. in the application proposes to sample for only three of the forty-eight constituents identified in 20.6.2.3103 NMAC. All of the constituents identified in 20.6.2.3103 NMAC are required to be analyzed. Please provide financial estimates that comply with the requirement of Paragraph (9) of Subsection C of 19.15.36.8 NMAC.

CONTINGENCY PLAN:

Pursuant to Paragraph (10) of Subsection C of 19.15.36.8, the application shall include "a contingency plan that complies with the requirements of Subsection N of 19.15.36.13 NMAC and with NMSA 1978, Sections 12-12-1 through 12-12-30, as amended." Pursuant to Subsection N of 19.15.36.13 NMAC, "each operator shall have a contingency plan. Paragraphs (1) through (14) of Subsection N of 19.15.36.13 NMAC identify the information required in the plan. The contingency plan submitted in the application does not provided the information in the manner required in the rule nor does it address all of the concerns and conditions identified with Subsection N of 19.15.36.13 NMAC. Please review the requirements and provided the appropriate information.

SITING & MW-2:

The siting requirements applicable to a landfill are identified in Subsections A and B of 19.15.36.13 NMAC. Subsection A of 19.15.36.13 NMAC identifies the criteria for depth of ground water. Paragraph (1) of Subsection A of 19.15.36.13 NMAC states 'no landfill shall be located where ground water is less than 100 feet below the lowest elevation of the design depth at which the operator will place oil field waste." Based upon the information provided in the application, OCD is unable to determine if one landfill cell is proposed or if there will be multiple landfill cells across the proposed area. The enlarged landfill design drawings illustrate and suggest that the proposal is for a single landfill cell. Information and drawings provided in the application and the groundwater investigation report (submitted by Safety & Environmental Solutions, Inc. and received by OCD on August 4, 2008) suggest that there will be multiple landfill cells within the proposed surface waste management facility boundary. Please clarify the extent of the proposal. If additional landfill cells are proposed, please provide the design for each cell and illustrate its location in relationship to all other cells. Artesia Aeration must demonstrate ground water is greater than 100 feet below the lowest elevation of the design depth at which oil field waste will be placed. The information provided in the application and the additional ground water reports suggests that shallow ground water is present and does not characterize the ground water beneath the proposed landfill area. Subparagraphs (b), (c); and (f) of Paragraph (15) of Subsection C of 19.15.36.8 NMAC identifies hydrological data that is required in the application, such as laboratory analyses, performed by an independent commercial laboratory, for major cations and anions; BTEX; RCRA metals; and TDS of ground water samples of the shallowest fresh water aquifer beneath the proposed site; depth to, formation name, type and thickness of the shallowest fresh water aquifer; and potentiometric maps

for the shallowest fresh water aquifer. This information is not provided. Please demonstrate compliance to ground water separation criteria and provide all of the information required in Paragraph (15) of Subsection C of 19.15.36.8 NMAC, including the geological data.

Subsection B 19.15.36.13 NMAC identifies the other criteria that apply to all surface waste management facilities, including landfills. Please provide and reference the location of the supporting documentation that demonstrates compliance to the siting requirements.

DESIGN DRAWINGS:

The proposed design drawings received by OCD on August 4, 2008 are incomplete and illustrate design features contrary to the regulations. Please provide engineering design drawings that illustrate and demonstrate compliance to the design requirements of 19.15.36 NMAC. Also, please provide engineering design drawings that illustrate the each and all of the proposed landfill cells and the landfill area(s) at final closure. Such drawings would illustrate the installation of the final cover with elevations of the proposed final design height and exterior side slopes and identify the design capacity of each landfill cell or the complete landfill disposal area. Please provide the final design drawings and appropriate cross-sections.

The OCD recommends that Artesia Aeration and your consultant (hydrologist/geohydrologist) schedule a meeting with OCD to establish a plan to properly characterize the geology and groundwater beneath the area proposed landfill prior to taking any further action. The goal is to establish an assessment plan that will provide the appropriate information to determine if the site is viable. If the site is determined to be viable, the OCD recommends that Artesia Aeration and your consultant schedule another meeting to discuss the deficiencies of the application identified above, in order for OCD to provide instruction on how they should be addressed.

Jones, Brad A., EMNRD

From: Jones, Brad A., EMNRD
Sent: Thursday, February 19, 2009 3:02 PM
To: Bob Gallagher (gallagher@nmoga.org)
Cc: Fesmire, Mark, EMNRD; Price, Wayne, EMNRD; Prukop, Joanna, EMNRD; Larry Parker; Dusty Wilson
Subject: Artesia Aeration

Bob,

I just wanted to provide a summary of our telephone conversation today regarding Artesia Aeration's permit application for an OCD landfill in order to ensure that there is an understanding of the issues and items that we discussed.

Item 1 Current status of the application review:

The most recent version of the permit application was received by OCD on January 26, 2009. Based upon a preliminary review, OCD has determined that Artesia Aeration made very few changes to the original application portion of the submittal, also the additional ground water assessment work performed at the proposed location did not consider or address the 100 foot separation siting requirement. The ground water assessment work was done without any involvement with or input by the OCD. The ground water investigation report, generated by Daniel B. Stephens & Associates, Inc., only assessed a shallow water bearing zone and limited the assessment to an area surrounding an existing monitoring well MW-2 and landfarm cells 5 and 6. It did not identify the extent of the shallow water bearing to the west and north nor did it include the proposed landfill area.

Item 2 Meeting with OCD

As we discussed in our telephone conversation today and previously, on September 11, 2008, the OCD recommends that representatives from Artesia Aeration, their consultant, and you schedule a meeting with OCD to discuss the outstanding issues of the permit application and the hydrogeological assessment for the proposed landfill area. The OCD recommends that this meeting occur before any additional work is performed.

Item 3 Hiring an experienced consultant

As discussed today and in our previous phone call, the OCD recommends that Artesia Aeration obtain the services of a consultant who possess experience and expertise in the submittal of permit applications for municipal landfills and has an understanding with regards to the construction, design, and operation of landfills. The OCD cannot recommend any party or person, but recommends that you or Artesia Aeration contact the Solid Waste Bureau (NMED) for a list of consultants that have submitted permit application within the past 2-3 years.

The OCD is ready to assist Artesia Aeration and your with the landfill permit application process by recommending techniques, formats, and sources that can assist Artesia Aeration in the development of an appropriate permit application submittal. The OCD appreciates your willingness to become involved in the process and assist Artesia Aeration with their permit application submittal.

Brad

Brad A. Jones
Environmental Engineer
Environmental Bureau
NM Oil Conservation Division
1220 S. St. Francis Drive
Santa Fe, New Mexico 87505
E-mail: brad.a.jones@state.nm.us
Office: (505) 476-3487
Fax: (505) 476-3462

ARTESIA AERATION

APPLICATION FOR SURFACE WASTE PERMIT 01/05/09

RECEIVED
2008 AUG 4 PM 1 28

ARTESIA AERATION

APPLICATION FOR SURFACE WASTE PERMIT

RECEIVED

JAN 26 2009

Environmental Bureau
Oil Conservation Division

For State Use Only

1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-137
Revised March 1, 2007

Submit 1 Copy to Santa Fe Office

APPLICATION FOR SURFACE WASTE MANAGEMENT FACILITY

A meeting should be scheduled with the Division's Santa Fe office Environmental Bureau prior to pursuing an application for a surface waste management facility in order to determine if the proposed location is capable of satisfying the siting requirements of Subsections A and B of 19.15.36.13 NMAC for consideration of an application submittal.

1 Application: x New ☐ Modification ☐ Renewal

2. Type: ☐ Evaporation ☐ Injection ☐ Treating Plant ☐ Landfill ☐ Landfarm ☐ Other

3. Facility Status: ☐ Commercial ☐ Centralized

4. Operator: Artesia Aeration

Address: P.O. Box 310 Hobbs, New Mexico 88241

Contact Person: Lary Parker Phone: 575-390-6402

5. Location: _____/4 _____/4 Section 5, 6, 7 Township 17S Range 32E

6. Is this an existing facility? ☐ Yes XX No If yes, provide permit number _____

7. Attach the names and addresses of the applicant and principal officers and owners of 25 percent or more of the applicant. Specify the office held by each officer and identify the individual(s) primary responsible for overseeing management of the facility.

8. Attach a plat and topographic map showing the surface waste management facility's location in relation to governmental surveys (quarter-quarter section, township and range); highways or roads giving access to the surface waste management facility site; watercourses; fresh water sources, including wells and springs; and inhabited buildings within one mile of the site's perimeter.

9. Attach the names and addresses of the surface owners of the real property on which the surface waste management facility is sited and surface owners of the real property within one mile of the site's perimeter.

10. Attach a description of the surface waste management facility with a diagram indicating the location of fences and cattle guards, and detailed construction/installation diagrams of pits, liners, dikes, piping, sprayers, tanks, roads, fences, gates, berms, pipelines crossing the surface waste management facility, buildings and chemical storage areas.

11. Attach engineering designs, certified by a registered professional engineer, including technical data on the design elements of each applicable treatment, remediation and disposal method and detailed designs of surface impoundments.

12. Attach a plan for management of approved oil field wastes that complies with the applicable requirements contained in 19.15.36.13, 19.15.36.14, 19.15.36.15 and 19.15.36.17 NMAC.

13. Attach an inspection and maintenance plan that complies with the requirements contained in Subsection L of 19.15.36.13 NMAC.

14. Attach a hydrogen sulfide prevention and contingency plan that complies with those provisions of 19.15.3.118 NMAC that apply to surface waste management facilities.

15. Attach a closure and post closure plan, including a responsible third party contractor's cost estimate, sufficient to close the surface waste management facility in a manner that will protect fresh water, public health, safety and the environment (the closure and post closure plan shall comply with the requirements contained in Subsection D of 19.15.36.18 NMAC).

16 Attach a contingency plan that complies with the requirements of Subsection N of 19.15.36.13 NMAC and with NMSA 1978, Sections 12-12-1 through 12-12-30, as amended (the Emergency Management Act).

17. Attach a plan to control run-on water onto the site and run-off water from the site that complies with the requirements of Subsection M of 19.15.36.13 NMAC.

18. In the case of an application to permit a new or expanded landfill, attach a leachate management plan that describes the anticipated amount of leachate that will be generated and the leachate's handling, storage, treatment and disposal, including final post closure options.

19. In the case of an application to permit a new or expanded landfill, attach a gas safety management plan that complies with the requirements of Subsection O of 19.15.36.13 NMAC

20. Attach a best management practice plan to ensure protection of fresh water, public health, safety and the environment.

21. Attach a demonstration of compliance with the siting requirements of Subsections A and B of 19.15.36.13 NMAC.

22. Attach geological/hydrological data including:

(a) a map showing names and location of streams, springs or other watercourses, and water wells within one mile of the site;

(b) laboratory analyses, performed by an independent commercial laboratory, for major cations and anions; benzene, toluene, ethyl benzene and xylenes (BTEX); RCRA metals; and total dissolved solids (TDS) of ground water samples of the shallowest fresh water aquifer beneath the proposed site;

(c) depth to, formation name, type and thickness of the shallowest fresh water aquifer;

(d) soil types beneath the proposed surface waste management facility, including a lithologic description of soil and rock members from ground surface down to the top of the shallowest fresh water aquifer;

(e) geologic cross-sections;

(f) potentiometric maps for the shallowest fresh water aquifer; and

(g) porosity, permeability, conductivity, compaction ratios and swelling characteristics for the sediments on which the contaminated soils will be placed.

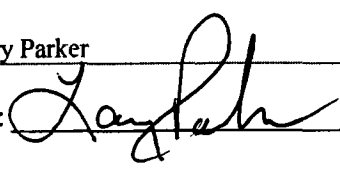
23. In the case of an existing surface waste management facility applying for a minor modification, describe the proposed change and identify information that has changed from the last C-137 filing.

24. The division may require additional information to demonstrate that the surface waste management facility's operation will not adversely impact fresh water, public health, safety or the environment and that the surface waste management facility will comply with division rules and orders

25. CERTIFICATION

I hereby certify that the information submitted with this application is true, accurate and complete to the best of my knowledge and belief.

Name: Lary Parker

Signature: 

Title: Operational Manager

Date: 08/04/08

E-mail Address: _laryp1128@yahoo.com

Application for Solid Waste Landfill Submitted by Artesia Aeration

The following is a listing of the owners of Artesia Aeration located 1.2 miles west of Maljamar, New Mexico. They also are equal owners of the real property on which Artesia Aeration is located.

Jim Wilson
8115 N. Grimes
Hobbs, New Mexico 88240
505-392-4742

Rob Matthews
P.O. Box 181
Madisonville Texas
936-348-1255

Jack Matthews
26 E. Compress Road
Artesia New Mexico
575-748-2854

Glen Hedgecock
Carlsbad New Mexico 88220
575-234-9098

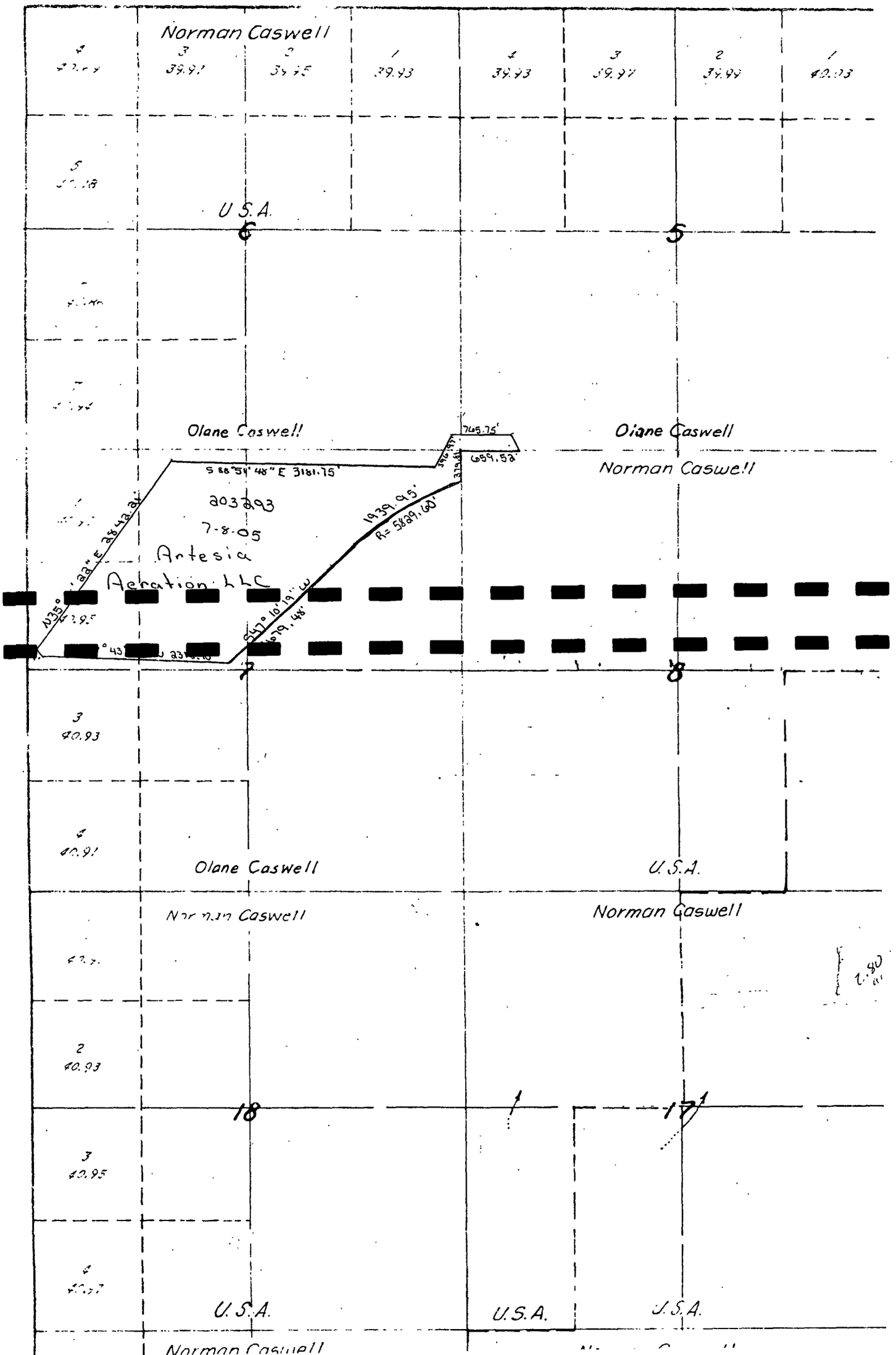
Operating Manager
Lary Parker
1718 W. Millen
Hobbs, New Mexico 88242
505-390-6402

Landowners of record within one (1) mile radius of Artesia Aeration are:

Olane and Ladoyce Caswell
Caswell Ranch
Maljamar, New Mexico 88264
806-637-7004

U.S, Department of Interior
Bureau of Land Management
Carlsbad Field Office
Attention: Bobbie Young
P.O. Box 1778
Carlsbad, New Mexico 88220-6292

State of New Mexico
State Highway and Transportation Department
District II Headquarters
4505 West Second Street
P.O. Box 1457
Roswell, New Mexico 88201-1457


Norman Caswell
U.S.A.
6
5
Olane Caswell
Olane Caswell
Norman Caswell
745.75'
689.52'
S 88°54'48" E 3181.75'
N35° 33' E 38.43.3'
203293
7-8-05
Artesia
Aeration LLC
1939.95'
R= 5829.60'
S47° 10' 19" W
679.48'
7
8
Olane Caswell
U.S.A.
Norman Caswell
Norman Caswell
18
17
U.S.A.
U.S.A.
U.S.A.
Norman Caswell

DESCRIPTION OF ARTESIA AERATION

Artesia Aeration is proposing to install a surface waste landfill disposal facility at a location that is one point two (1.4) miles west of Maljamar, New Mexico. It is adjacent to Artesia Aeration Landfarm which will be phased out upon awarding the waste permit for the landfill. Private landownership surrounding Artesia Aeration for one mile is the Caswell Ranch. Mr. Caswell is well aware of our endeavors to open a landfill and strongly supports our efforts.

Artesia Aeration is located on sections 5, 6, 7, of township 17S and range 32E in Lea County New Mexico. It consists of 167.856 acres of pasture land with no waterways, lakes, or streams located within guidelines set forth in 19.15.36.13 NMAC. The site is ideally located to help relieve the burden put upon the two existing landfill facilities currently permitted in Lea County and give greater options to operators in the surrounding operating area. In addition, the site meets and exceeds all siting requirements set forth in 19.15.36.13 NMAC.

The location and coordinates of the facility is 032deg 51' 14.23" N 103deg 48' 26.25"W. A map of the site located at back of application. Also attached is supporting maps, research, and plans to make the application acceptable to the commission.

We are located in an area that is easily accessible for producers and with the cell configuration and design will not be obtrusive to passing traffic or to the municipality of Maljamar, New Mexico. The site is ideally suited for our proposal and will help accomplish the desired results of the New Mexico Oil Conservation Division environmental containment program.

References

Ash, S.R. 1963. Ground-water conditions in northern Lea County, New Mexico: U.S. Geological Survey, Hydraulic Investigations Atlas.

Water well records on file with the Office of the New Mexico State Engineer and the U.S. Geological Survey.

Lea County Courthouse Public Record Department

PIT DESIGN

Artesia Aeration proposes the following pit design to comply with division specifications. The pit will be approximately 233ft X 244ft X 23ft with the construction and pit linings as follwos:

All construction shall conform to the construction specifications of NMAC title 19 section 15 part 36-surface waste management facilities. The base layer shall be placed on a prepared subgrade. It shall, at minimum, consist of two feet of clay soil compacted to a minimum 90 percent standard proctor density (ASTM D-698) with a hydraulic conductivity of 1 X 10-7 CM/SEC or less.

The clay soil component of a composite liner shall be compacted to a minimum of 90% standard proctor density (ASTM D698). The material shall have a plasticity index greater than 10%, a liquid limit between 25 and 50 percent. The portion of the material passing the #200 sieve (0.074mm and less fraction) shall be greater than 40% by weight, and have a clay content greater than 18% by weight.

The soil surface upon which the operator than one half inch in any dimension, organic matter, local irregularities, protrusions, loose soil, and abrupt changes in grade that could damage the geosynthetic.

The leak detection system between the primary and secondary geomembrane liners shall consist of two feet of compacted soil with a saturated hydraulic conductivity of 1 X 10-5 CN/SEC or greater.

Geomembrane liners shall consist of a 60-ml HDPE liner or an equivalent liner approved by the division. Geomembrane liners shall have a hydraulic conductivity no greater than 1 X 10-9 CM/SEC. Liner compactibility shall comply with EPA SW-846 Method 9090A.

Field seams for the geosynthetic material shall have thermal seals (hot wedge) with a double track weld to create an air pocket for non-destructive air channel testing. In areas where double-track welding cannot be achieved, the operator may propose alternative thermal seaming methods. A stabilized air pressure of 35 pounds per square inch, plus or minus one percent, shall be maintained for 5 minutes. The operator shall overlap liners for four to six inches before seaming, and shall orient seams parallel to the line of maximum slope: i.e., minimize the number of field seams in corners and irregular shaped areas. The operator shall use factory seams whenever possible. The operator shall not install horizontal seams within 5 feet of the top of the slope. Qualified personnel shall perform all field seaming.

The leachate collection and removal system shall consist of at least 2 feet of compacted soil with a saturated hydraulic conductivity of 1X10-2 CM/SEC or greater, over the upper geomembrane liner to facilitate drainage.

The soil component of the leak detection system shall consist of soil materials that shall be free of organic matter, shall have a portion of material passing the #200 sieve no greater then 5 percent by weight and shall have a uniformity coefficient less than 6, where CU is defined as D60/D10.

The leachate collection and removal system protection layer shall consist of a soil layer at least 1 foot thick with a saturated hydraulic conductivity of 1 X 10-2 CM/SEC or greater, over the leachate collection and removal system. Materials shall be free of organic matter and have a portion of material passing the #200 sieve no greater than 5 percent by weight and shall have a uniformity coefficient (CU) less than 6, where CU is defined as D60/D10.

Vents shall be installed per manufacturer recommendations.

All leak detection and leachate collection and disposal laterals will be installed at a 2% slope or greater.

Management Plan for Artesia Aeration

PART 1) Depth to ground water at Artesia Aeration is in excess of 100 feet as displayed by monitor wells drilled at location in accordance with 19.15.36.13 NMAC. No ground water is located 50 foot below the lowest level of disposal area in compliance with 19.15.36.13 section a. 5. Artesia Aeration meets all criteria set forth in 19.15.36.13 section B and is in compliant in all areas.

PART 2) Artesia Aeration waste management will be less than the 500 acres set forth in the siting requirements.

PART 3) Artesia Aeration has no plans or seeks no permits to accept waste fluids at the proposed landfill facility. Our primary function will be to accept solid oilfield wastes for disposal at the landfill only.

PART 4) Artesia Aeration will accept only non-hazardous oilfield waste that is verified by certification of a signed form C-138 from the generator or authorized agent. All exempt waste will be from approved process from oil and gas operations and explorations. These waste streams will not be co-mingled with non-exempt wastes. We will accept certifications on a per load basis with the exceptions of continual approved waste stream processes or projects. This certification will be on a monthly basis. This documentation will be inspected by an attendant at the time of entrance into facility. All documentation and certifications will be kept at facility for division inspection.

PART 5) Artesia Aeration will not accept waste that contains naturally occurring radioactive material (NORM). A radiation survey will be conducted with the copy of the survey being kept on site. This will be monitored and administrated by the agent of Artesia Aeration that will be on duty. All documentation of monitoring and inspection will be on hand at facility. Material having readings of more than 30 picocuries above background will be denied disposal access.

PART 6) All solid waste accepted at Artesia Aeration must pass the paint filter test pursuant to EPA method 9095 A.

PART 7) Artesia Aeration will accept non-exempt solid wastes with an approved C-138 and all required testing documentation. The testing required will be as follows:
TPH (hydrocarbon analysis)
TCLIP (hazardous constituent analysis)
Ignitability Test
Corrosivity
Reactivity Test
Paint Filter Test
All material must be below limits set forth. Testing must be at approved and recognized test facility with copy of test results accompanying C-138 and kept at facility for division inspection.

PART 8) Artesia Aeration will accept non-hazardous, non-oilfield waste only is so directed by the department of public safety. We will complete C-138 describing waste and reason for acceptance and submit to OCD for inspection.

PART 9) Operational procedures for Artesia Aeration will be as follows:

A 6ft X 6ft sign will be on display at entrance to facility stating facility name, permit number, legal location, and emergency phone numbers. This sign will be visible for 100 foot.

An employee will be on duty during all operational hours stationed at entrance to facility. The gates will be locked when an attendant is not on duty and the facility is closed. Normal operating hours will be from 7:00am mst to 5:30pm mst Monday through Friday. Facility may remain open for extended time during projects and based on facility personnel. No entrance will be allowed when attendant is not on duty. Entire facility will be fenced and all gates will be locked.

All documentation and recordkeeping will be maintained at disposal facility. Copies of all incoming manifests, C-138's, and other documentation will be filed and available for division inspection. All manifests will include generators name, site or location from which waste was generated, date of disposal, description of material, and volume of material. The will also include the transporter, name of the driver, and the person accepting the material as well as the time of day. A sample of receiving manifest will be submitted for approval by the division upon permitting.

PART 10) Artesia Aeration will conduct monthly inspection of all leak detection monitoring stations on all disposal cells active and closed. This inspection will include volume of leak detected, a report of analytical data, a detail report of date, location of detection, and corrective measures proposed. This inspection will be made available to the division and be kept on file at facility. The report will include the status of the leak detection system and the name of the inspector. The inspection will be made within the first five days of each month.

An inspection will be made twice yearly of all monitoring wells associated with the facility. Water, if encountered, will be analyzed and all reports of sampling will be supplied to OCD division. Any maintenance records, status reports, and inspectors name will also be supplied in accordance with guidelines.

Inspection of berms around active cells will be a daily activity with quarterly inspections being furnished to the division. Repairs made because of erosion, wind, or storm conditions will be corrected and noted with these records being kept at facility for inspection.

Artesia Aeration will maintain berms with a minimum height of three (3) foot around disposal cells to protect commingling of fluid run off with solid waste in cell. This will also prevent overflow of cell with excessive rain and moisture and contain fluids for removal to authorized fluid disposal facility. A buildup of fluids will be removed via vacuum trucks as accumulations warrant. No fluids will be stored on facility. There are no waterway, rivers, lakes, ponds, or playas within five (5) miles surrounding proposed facility.

MAINTENANCE PROCEDURES

A daily inspection will be done on entire facility. The inspection will be done by the supervisor on duty prior to opening of the facility daily. The inspection will begin with housekeeping duties performed at the proposed office and surrounding area. All trash will be disposed of and cleanliness will be demanded.

A complete inspection of all roadways will be done prior to opening the facility for disposal. Obstacles will be cleared and trash and debris removed and placed in dumpster. Leakage from trucks and vehicles, if any, on roadways will be cleared and disposed of in cell. A visual inspection of road condition will be made at that time also. If repair is needed, it will be made prior to opening facility.

Inspections will be made on disposal cell including berms, surrounding backing areas, and the pit itself. Repairs to berms will be made immediately to ensure runoff control is intact. The area where trucks and vehicles back to pit will be kept smooth and well indicated to avoid backing or pullout accidents and mishaps. The pit area will be visually inspected for any apparent problems. The surface covering of the liner will be adequately covered by soil to ensure no tearing or ripping of the liner on the surface area. An inspection of the surrounding fence will be done and any problems noted and handled promptly the same day to ensure security and prevention of unapproved access or accidental entry to facility by personnel or animals. All deficiencies or problems will be noted by the inspector and filed in office for reference and or inspection by the OCD. All write ups will be handled immediately or as soon as equipment or personnel become available. Inspections will done on all facility equipment such as loaders, dozers, and excavators to ensure trouble free operations and prevent breakdowns. Downed equipment could cause serious backup problems at the disposal. Inspection and maintenance records of all equipment will be kept at office.

Cleanliness, safety, and environmental protection will be our uppermost priority and will not be taken lightly. All inspection records will be reviewed by operations manager daily and follow up inspections will be performed.

H2S Contingency Plan for Artesia Aeration

Artesia Aeration is appying for a solid waste permit and if approved we anticipate a very low exposure rate to hydrogen sulfide. The facility will be manned during all operating hours and admittance will be monitored and recorded. During closed hours gates will be closed and locked with admittance allowed only with company personnel present. Any load checked in at gate or office that has a H2s reading of more than 10ppm will be throughly checked and if reading register more than 50ppm entry will be denied and no alloance to dispose of at Artesia Aeration. To maintain a safety level for the pubic and for our emplyoees we will implement the following plans:

All emplyoees will receive training and certification for working in H2S environments. This training will be conducted by a certified training instuctor and company. Certification will be renewed annually and all employees will retain their certificates on their persons at all times.

All emplyoees working in the facility will wear personal H2S monitors while in the facility. Employees will be educated in the proper use and maintence of monitors. Monitors will be inspected and serviced by a certified person or company in accordance with manufactors requirements. In additon to personal monitors a multi-gas monitor will be on site to ensure safe working conditions. The multi-gas monitor will be located in the office area and be available to facility supervisor to monitor any readings over 10ppm. A Scott air pack will be located within facility office in the event of an emergency to be used to evacuate a fallen employee or visitor on site.

Windsocks will be installed strategically on site to inform employees, contractors, and customers on site of the prevailing wind directions in case of any excessive H2s releases. The socks will be placed as follows: One sock will be placed at the enterance to the facility and readily visable as one drives in to the facility. One will be placed southwest edge of the facility 50 feet from nearest disposal cell. One will be placed on northern edge of disposal cell area. These windsocks will be of adaquate size and color to be readily visable

from disposal area and will comply with regulations concerning previous. An audio warning devise will be installed to notify persons on site in the event of a discharge of over 100ppm H2S. Instructions will be posted in office proper manuvers in the event of an emergency.

The following emergancy phone numbers will be posted for notification in the event of a H2S release of over 100ppm.

Lovington Fire Department - Emergency 911- Non emergency- 505-396-2359
Maljamar Fire Department- Emergency 911- Non emergency- 505-676-4100
Loco Hills Fire Department- Emergency 911- Non emergency- 505-746-5000
New Mexico State Police Emergency 911- Non emergency- 505-392-5588(in accordance with N.M. HMER)
Lea County OCD Non emergency- 505-393-6161

An assemly area will be established directly outside of eastern gate for all employees to gather in the event of an H2S release. This area will be designated by a sign and on the emergency information sheet in office. The plant manager will be in charge of personnel acountability in the event of an evacuation. Drills will be conducted on a quarterly basis with documentation of drill and results will be kept on site for one year.

In the event of a release of over 100ppm H2S the following procedures will be followed:

The alarm will be sounded by supervisor or first available employee.
All personnel are to assemble in designated area.
Supervisor will ensure all personnel are accounted for and assembled.
Emergency phone numbers will be called by supervisor or available employee.
Gates will be closed and locked.
Entry will not be allowed except for trained responders.
Supervisor and employees will co-operate with responders and assist

as directed.
All clear will sound when emergency has been eradicated and responders have given all clear.
Gates will be reopened only at that time.
Detailed report will be given to OCD within 24 hours.

At all times Artesia Aeration will abide and adhere to the "Recommend Practices for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide" RP-55. It is our goal to make Artesia Aeration a safe atmosphere in which to work with the knowledge that we are doing our part to ensure safety.

CLOSURE PLAN FOR ARTESIA AERATION

Artesia Aeration will have only one open active cell in operation at any given time and we are only going to be a solid waste facility. Consequently, as a disposal cell becomes filled we will close it completely pursuant to 19.15.36.14 paragraph 8 of Subsection C. This will incorporate 12 inches of compacted sand above top of oilfield waste material and then the installation of a 60-mil HDPE liner material as supplied and installed by Akome Inc. We will have 12 inches of sand on top of liner utilizing a 4% slope to aid in drainage. The final layer will be of native soils that will be re0seeded. Quotes from Sweatt Construction and Akome Inc. are attached showing scope of their work.

We are also submitting a closure sampling process that will have an engineering firm sample all monitoring wells quarterly for the first year after closure and semi-annually thereafter. This testing should satisfy requirements as stated in 19.15.36.18 Subsection D paragraph 3. Attached is estimate and scope of work by Safety and Environmental Solutions Inc.

Upon closure of facility all fences will be checked for integrity and damages and repaired as needed. Temporary structures will be removed. Gates would be securely locked and postings of facility closure would be prominently displayed at entrance. This work would be done at the prevailing roustabout rate of $80.00/ hour.

Utilizing the cost estimates provided the approximate cost of closure would be $127,234.37. This includes sampling of monitoring wells for 30 years as stated in 19.15.36.18 Subsection D paragraph 3.

GCI/d/b/a SWEATT CONSTRUCTION INC.
720 SOUTH TEXACO ROAD
HOBBS, NEW MEXICO 88240
(505) 393-3180 - FAX (505) 391-9895

GENERAL DIRT WORK
OIL FIELD ROADS - PITS - LOCATIONS

DECEMBER 28, 2007

ARTESIA AERATION INC.

ATTN: JIM WILSON OR LARRY PARKER

RE: LANDFILL CLOSURE AND RECLAMATION
LEA COUNTY, N.M.

WE WISH TO SUBMIT OUR BID TO FURNISH LABOR AND MATERIALS TO COVER USING ONSITE MATERIAL AND RE-SEED APPROXIMATELY 50 ACRES. USEING WATER TRUCK TO FACILITATE SEED GROWTH AS DIRECTED.

TOTAL BID PRICE	$28,620.00
TAX	1,538.33
TOTAL BID PRICE INCLUDING TAX	$30,158.33

SINCERELY,

KENDALL LIVINGSTON
VICE PRESIDENT
GCI d/b/a SWEATT CONSTRUCTION, INC.

THANK YOU FOR THE OPPORTUNITY TO BID ON THE ABOVE PROJECT.

KL/sp

Per your request, here is a cost estimate in current dollars for water sampling at Artesia Aeration assuming all three wells need to be sampled:

Labor $275
Mileage $125
Equipment Rental (meter, pumps) $115
Sampling/Laboratory analysis (BTEX, TDS, Chloride) $405
Expendibles (twine, gloves) $20
Expendibles first sampling (bailers, tubing) $107.50

Summing this up, the first year sampling (quarterly) will be $1,047.50 + ($942 x 3) = $3,873.50 + tax
Each subsequent year, semi-annual sampling $942 x 2 = $1,884 + tax

These are cost estimates only based on current charges for the items listed above. SESI work is performed on a time and materials basis.

If you need further information, please let me know.

Dave

David G. Boyer, P.G.
Hydrogeologist
Safety and Environmental Solutions, Inc.
P.O. Box 1613
703 E. Clinton, Suite #102
Hobbs, NM 88241
office: 575-397-0510
fax: 575-393-4388
cell: 575-390-7067
email: dgboyer@sesi-nm.com

CONTINGENCY PLAN FOR ARTESIA AERATION

Artesia Aeration will be a solid oilfield waste only disposal facility. At no time will the disposal or storage of liquid oilfield waste be allowed. The contingency plan will reflect this fact. Any amendments to this contingency plan including changes of emergency coordinators, changes in facility design, and equipment changes will posted five (5) days prior to change. The division will be notified prior to changes for approval.

In the event of a fire the response action will be to immediately contain the fire in the area it occurs and the evacuation of personnel non-essential to the rehearsed response. The fire will be contained by the use of stored soils that surround the disposal pit. The fire department services will be called immediately on discovery or reporting of the fire. A listing of the fire response departments will be on display at the onsite disposal office as well as onsite personnel training for such emergencies. The emergency coordinator will make the additional reporting processes as necessary. The area immediately surrounding the disposal cells will have all ready been cleared of all vegetation which will help to isolate any fire hazard or spreading of fire. An alarm horn, with adequate volume, will be installed at disposal office which will be activated to alert personnel of emergency. An evacuation escape route and staging area will be posted prominently for employee and visitor information.

Fire extinguishers will be located at central location and at active disposal cell for extinguishing smaller fires. All fires will be reported promptly to the OCD division. Explosions will be responded to by the emergency coordinator by first evacuating all personnel to staging area located outside entrance to facility. He will immediately notify all appropriate fire departments, police agencies, and state and local response teams. Having no fluid stored or disposed of at the facility the danger of explosions and fires are lessoned greatly but our response training and vigilance to maintain a safe environment will not be lessoned.

Any emergency situation such as an explosion, fire, gas release, or release would constitute a temporary closing of the facility. The emergency coordinator would take the following steps:

1. Use notification system to alert personnel of emergency situation.
2. Alert all employees to shut down all equipment, electrical and mechanical and report to staging area east of facility.
3. Identify the character, exact source, amount, and extent of any released materials. This will be done by observation or review of facility records and, if necessary, by chemical analysis.
4. Concurrently assess possible hazards to human health and or the environment that may result from the release, fire, or explosion. This assessment will consider both direct and indirect effects.
5. Notify the appropriate state or local agencies if their help is needed. The agencies and contact numbers are listed below.
6. If the coordinator determines that the emergency could threaten health or the environment outside the facility he must report his findings as follows:
    a) If his assessment indicates that evacuation of local areas may be advisable, he must immediately notify appropriate authorities. He must be available to help the officials decide their course of action; and
    b) He must immediately notify the National Response Center (1-800-424-8802)
    c) The report will include the following:
    Name and phone number of the reporting party
    Name and address of the facility
    Time and type of incident(fire, explosion, etc.)
    Name and volume of materials involved
    The extent of injuries if any
    The possible hazards to human health, or the environment outside of the facility.

7. During the emergency, the coordinator must take all reasonable measures necessary to ensure that fires, explosions, or releases do not occur, or recur, or spread to other areas of facility. This could include stopping operations, collecting and containing releases, and removing or isolating materials.
8. Immediately after emergency, the Emergency Coordinator must provide for storing and disposing of recovered waste, contaminated

fluids, or any other material that results from a release, fire, or explosion at the facility.

9. The Coordinator must ensure that in the affected areas of the facility;
    a) No waste that may be incompatible with the released material is treated, stored, or disposed of until cleanup procedures are completed;and
    b) All emergency equipment listed in the contingency plan is cleaned and ready for use before operations are resumed.
10. The Emergency Coordinator must notify the Regional Administrator of the EPA, Region VI in Dallas Texas (214-606-6444) and the appropriate state (NM-EID 505-827-2926) and local (Lea County LEPC 505-397-3636) authorities that the facility is in compliance before operations may be resumed in the affected areas of the facility.
11. The Emergency Coordinator must document time, date, and details of any incident that requires implementing the contingency plan. Within 15 days after an incident the company must submit a written report on the incident to the EPA Regional Administrator, Region VI 1201 Elm Street, Dallas, Texas 75270 and the New Mexico Environmental Improvement Division, Hazardous Waste Bureau, 1190 St. Francis Drive, P.O. Box 968, Santa Fe, New Mexico 87504-0968. This report will include:
    a) Name, address, and telephone number of owner or operator.
    b) Name, address, and telephone number of the facility.
    c) Date, time, and type of incident (fire, explosion, release)
    d) Name and quantity of materials involved.
    e) The extent of any injuries.
    f) An assessment of actual or potential hazards to human health or the environment.
    g) Estimated quantity and disposition of recovered material that resulted from the incident.

Any release of contaminates because of excessive rains or flooding would be first contained be berm extensions and heightening efforts. The emergency coordinator would notify division within twenty-four hours following such an occurrence where the material breached the surrounding berms. The coordinator will also contact any appropriate state or local agencies within

the same time frame as needed. Containment of contamination would be ongoing with procedures to protect the health of personnel and the impact on the environment being the priority of the coordinator. Clean up of contamination would be started immediately upon determination of extent and approval of all agencies involved. Progress of cleanup would be reported daily with expected completion time frame included.

An explosion would constitute a closure of facility. After evacuation and notification a thorough investigation would determine cause and effect. Procedures would be instituted to alleviate any further dangers and prevent future incidents prior to re-opening facility.

Artesia Aeration will only be accepting solid non hazardous wastes such as contaminated soils, drilling operations waste, oilfield debris, and associated materials. We will be accepting no hazardous materials as demonstrated by C-138 that will accompany all materials disposed of at facility. Artesia Aeration will not be accepting any fluids for storage, disposal, or re-cycling.

Artesia Aeration will be using a chimney method to manage any gas accumulations that may arise. We will incorporate the use of slotted PVC chimney pipes through out our disposal cells. These pipes will be three (3) inch in diameter. They will be slotted and buried tem (10) foot below grade with three (3) foot above surface. These will help relieve any buildup of gas generated in the land fill. These chimneys will be monitored monthly using a multi-gas monitor. These readings will be logged and kept on site for evaluation and inspection by division. These monitoring systems will be left in place upon closure of disposal cell and will also be in place during a final closure plan.

The following is a listing of emergency phone numbers that will be posted in a prominent place within the onsite disposal office:

Lovington Fire Department	911	non emergency - 505-396-2359
Maljamar Fire Department	911	non emergency - 505-676-4100
Loco Hills Fire Department	911	non emergency - 505-746-5000
New Mexico State Police	911	non emergency - 505-392-5588
Lea County Sheriff	911	non emergency -505-393-2515
Lea County OCD office		non emergency - 505-393-6161
New Mexico DOT		non emergency- 505-887-0460

Lary Parker will be the **Emergency Coordinator** for Artesia Aeration
Address 1718 West Millen Drive, Hobbs New Mexico 88242
Home Phone Number 505-631-9252 Emergency Phone 505-631-6402

A second person will be designated secondary emergency coordinator when our permit is issued. Contact information will be forwarded to division office as well as response agencies at that time. Any changes or additions to these designees will be forwarded to the appropriate agencies.

Upon receipt of permit all pertinent information will be supplied to each of the emergency responders listed.

The following is a list of all emergency equipment to be on hand upon opening of disposal facility:
3- Fire extinguishers 2 eight pound and one twenty-five pound class ABC
5- H2S monitors
2- 73 piece first aid kits
2- 10 minute H2S escape packs
1- Alarm system located on office with volume to be heard for ½ mile.
(Alarm will be activated upon explosion, H2S high level, or fire.)
2- Wind socks to monitor wind direction. One located at entrance and one at active disposal cell

TRAINING PROGRAM

Artesia Aeration will conduct an annual training seminar for all key personnel. All operational systems will be discussed with training in areas that are related to each individual responsibility being addressed. Any changes that transpired will be discussed. Emergency operations and responsibilities will be reiterated with an evaluation of the previous year's progress. Sampling procedures will be discussed and results of previous year will be evaluated. Review of all paperwork and evaluation of the C-138's will be discussed. All minutes of these meetings will be recorded and kept on file for five (5) years.

All employees will receive training in RCRA general requirements with discussions on emergency response actions appropriate to the specific wastes handled at the facility.

All employees will receive training on proper use of fire extinguishing equipment as well as decontamination of spill control equipment.
All employees will participate in drills and evacuation procedures and their prospective assignments in the event of and emergency.

In addition to these training sessions we will also have monthly safety meetings that will be mandatory for all personnel. Safety issues will be addressed as well as safety training in such areas as H2S safety, first aid, fire fighting, heat stress, personal safety equipment, etc. During these meeting we will also discuss various aspects of our daily processes such as paperwork, waste sampling, and disposal cell maintenance. Records of these meeting will also be kept on record for inspection for five (5) years.

MONITOR WELL #2 ANALYSIS

An observation was made that monitor well #2 had water of an unknown source at a height of 26". While there is water in the monitor well it is believed that the water is not from a viable potable water source. The geology of the area seems to contribute to pooling effect experienced in the monitor well.

Monitor well #2 is 315' southwest of our proposed disposal area and was drilled to a depth of 40'. To alleviate any future concerns about the presence of water in the well we began to investigate the source of the water by two methods.

First we began to investigate ourselves then we solicited the services of Daniel B. Stephens. Enclosed are the results of our field investigation and the detailed report from Daniel B. Stephens.

We decided to dig trench pits at various intervals around MW2 to determine the direction of water migration into the well. Chart C1 shows the GPS location of all trenches that were dug in relation to MW2.

All trenches were dug to a minimum depth of 40' and an average length of 50'. All trenches were dug using the step down method due to the depth. We left the trenches open for a period of time to monitor any fluid migration. Chart C2 chronicles our observations. Our conclusions are on the following page.

In addition we hired Daniel B. Stephens to also do an investigation of our site. Michael Mcvey was the hydrologist designated to do this work and his research and results are included in his summery booklet which is an inclusion to our application.

CHART C-1

TRENCH 1	32deg N 51' 07.9"	103deg W 48' 14.5"
TRENCH 2	32deg N 51' 07.5"	103deg W 48' 13.6"
TRENCH 3	32deg N 51' 07.5"	103deg W 48' 13.6"
TRENCH 4	32deg N 51' 08.8"	103deg W 48' 11.5"
TRENCH 5	32deg N 51' 10.1"	103deg W 48' 09.5"
TRENCH 6	32deg N 51' 07.1"	103deg W 48' 12.4"
TRENCH 7	32deg N 51' 07.8"	103deg W 48' 15.3"
TRENCH 8	32deg N 51' 08.7"	103deg W 48' 14.8"
TRENCH 9	32deg N 51' 05.3"	103deg W 48' 16.3"
TRENCH 10	32deg N 51' 05.9"	103deg W 48' 17.2"
TRENCH 11	32deg N 51' 09.5"	103deg W 48' 19.3"
TRENCH 12	32deg N 51' 13.4"	103deg W 48' 17.5"

MONITOR WELL #2 IS LOCATED AT 32DEG N 51' 13.4" 103DEG W 48' 13.9" FOR REFERENCE

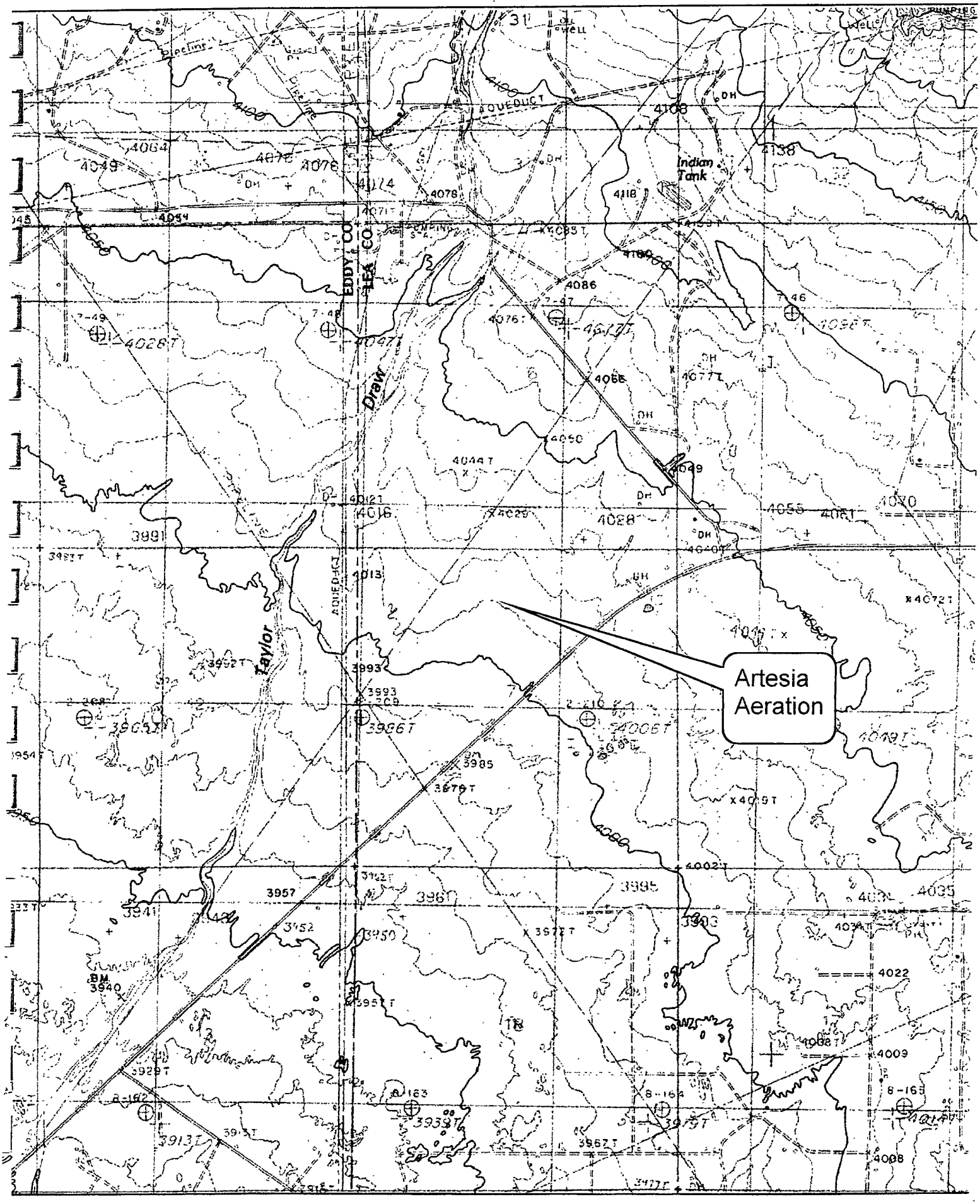
CHART C-2

We began digging the observation trenches on February 2, 2008. Wayne Price and Brad Jones with the OCD came to evaluate the results and progress of the pits on February 20, 2008 and wrote summary of their visit dated February 21, 2008

When trench numbers 1, 2, 3, 4, and 7 were dug we encounter moist soil at 37 foot. We continued digging until approximately 40 foot. Overnight water drained into trenches to the height of about 1.5 foot. Trench 8 had no show of moisture or water until second day after digging. Water level rose to about 18" and has not varied to date.

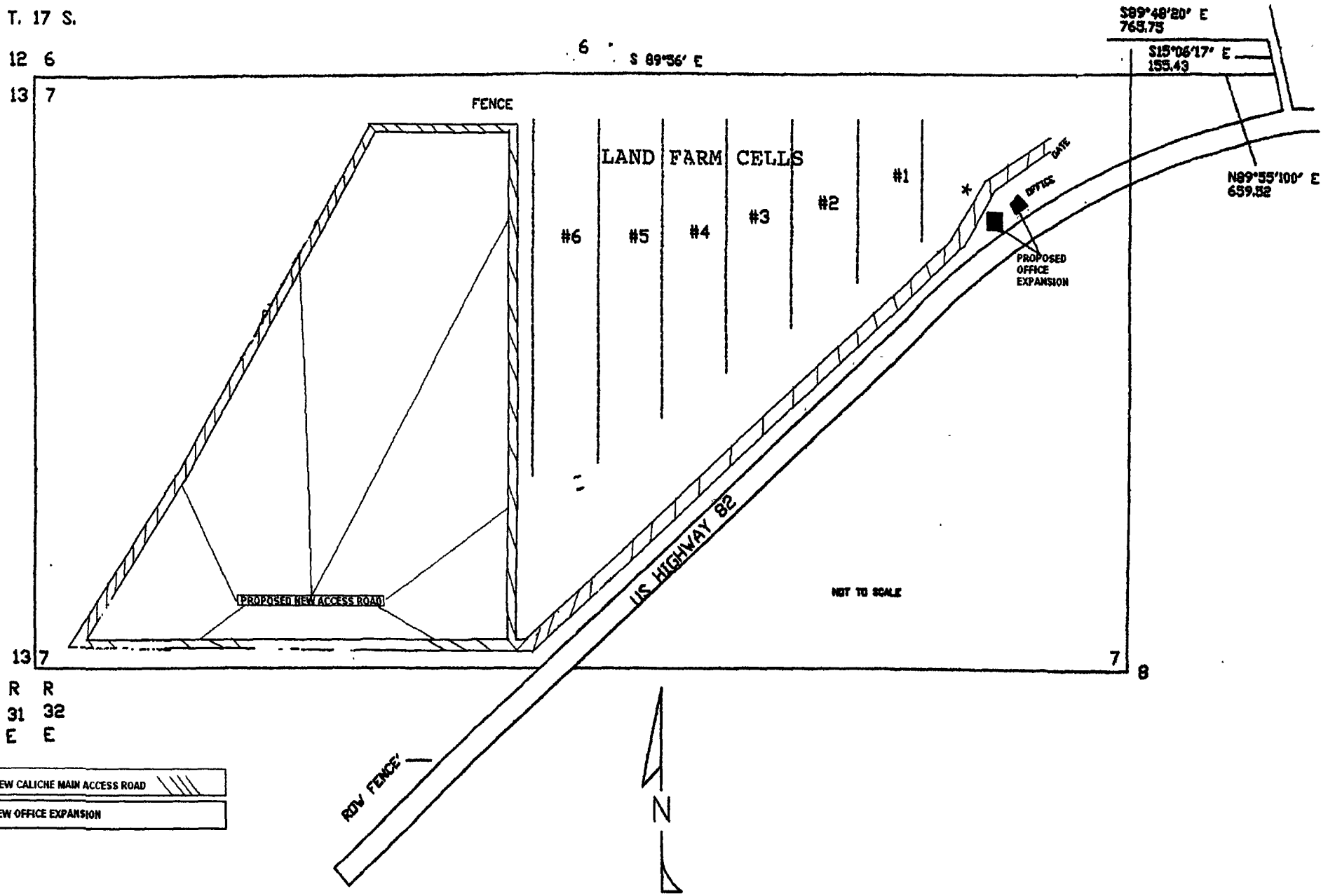
Trenches 5, 9, 10, 11, and 12 had no show of moisture and had no water drain into trench and remain dry today.

The trenches were observed daily during the time the monitor well was bailed out. The water level dropped on all well having standing water. On 3/06/08 the level in trench 7 had dropped to no standing water. The levels on the other 5 trenches had declined to about 1 foot of standing water. On March 24 only pit #8 had any significant standing water with a level of less than one foot. Trenches 1, 2, 3, 4, and 7 had dampness at bottom of trench, but no standing water.



Name: MALJAMAR
Date: 1/29/2008
Scale: 1 inch equals 2000 feet

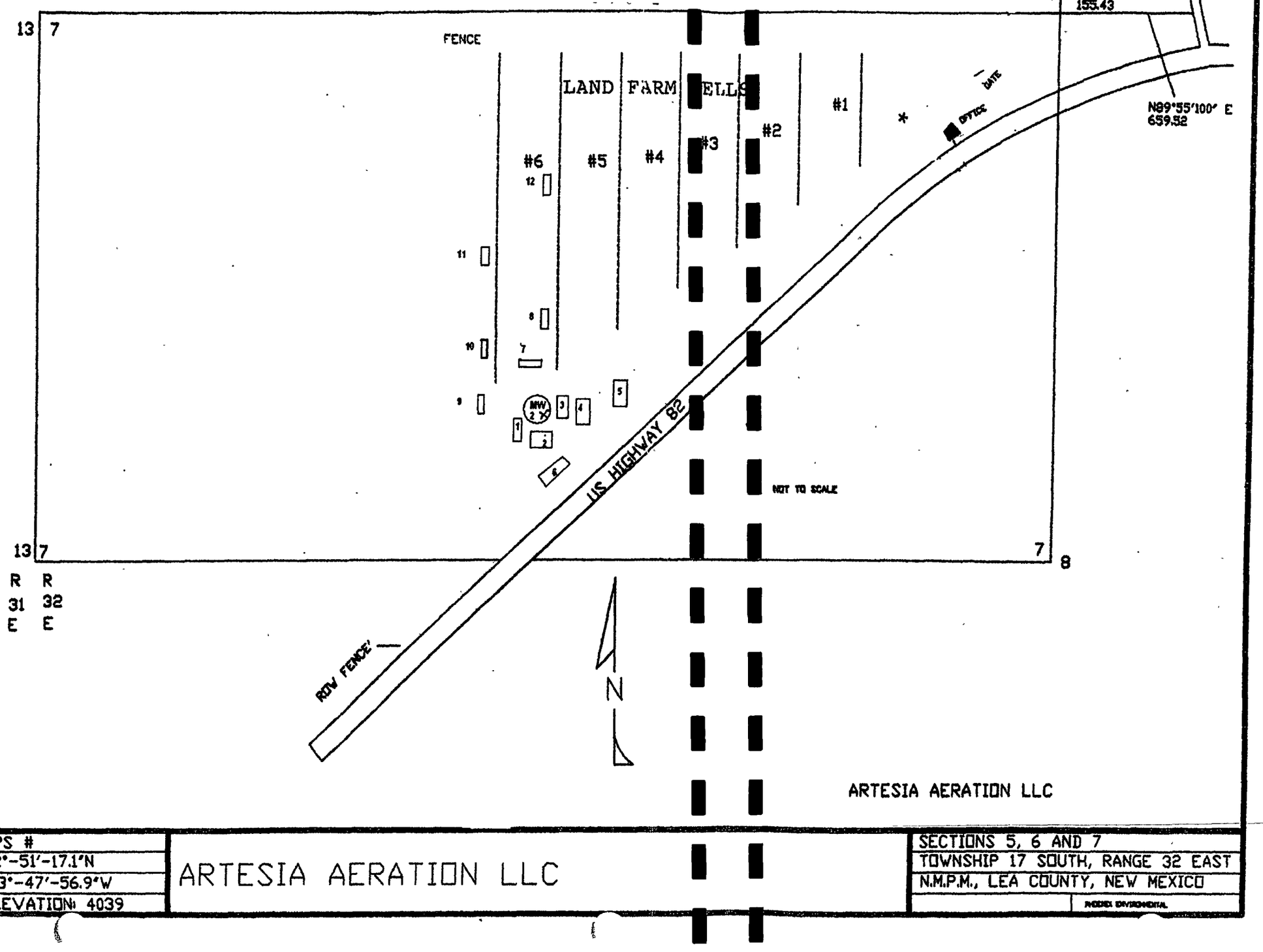
Location: 032° 51' 14.23" N 103° 48' 26.25" W NAD 83
Caption: Figure 1. Location Map, Artesia Aeration, Lea County, New Mexico



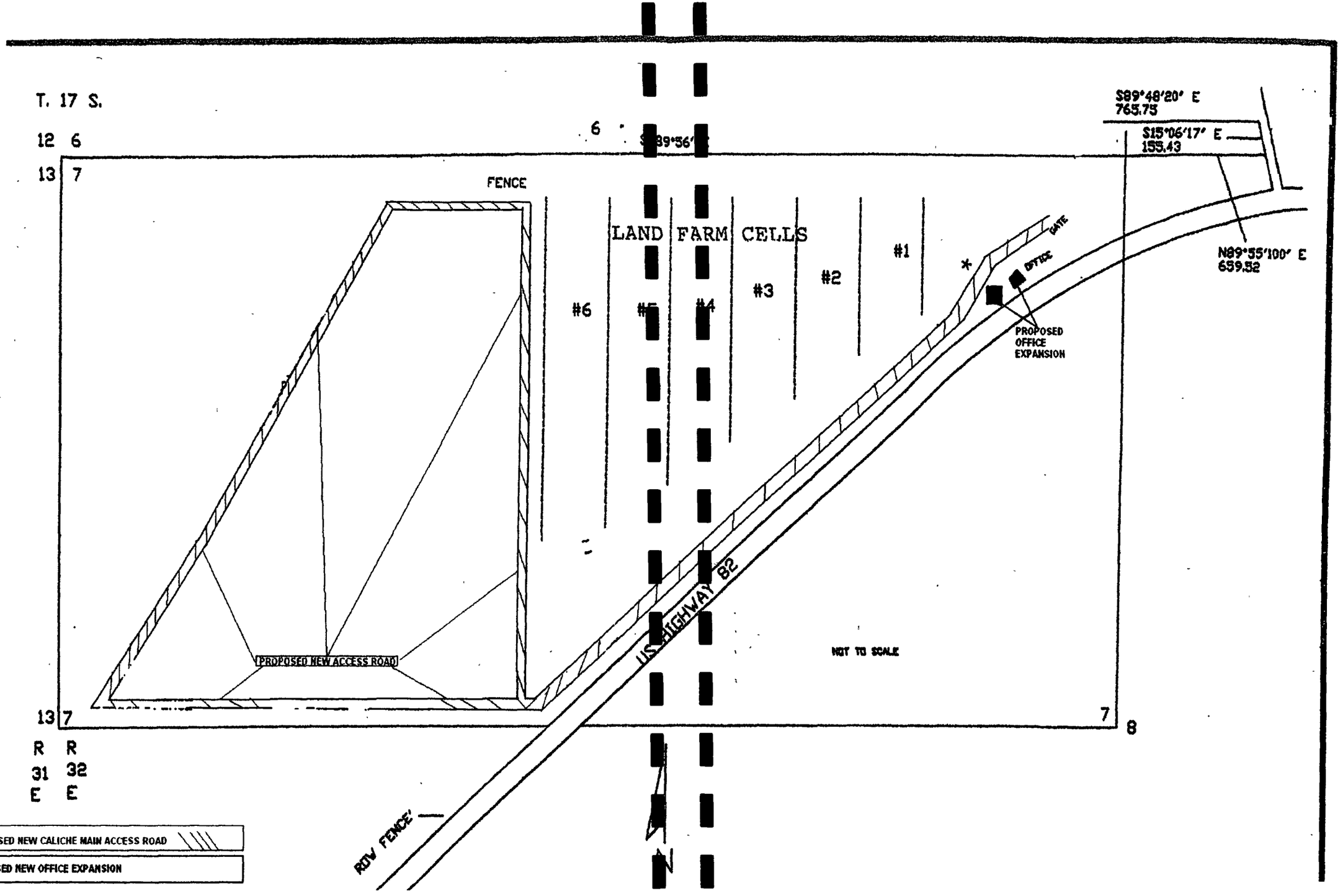
GPS #
32°-51'-17.1"N
103°-47'-56.9"W

ARTESIA AERATION LLC

SECTIONS 5, 6 AND 7
TOWNSHIP 17 SOUTH, RANGE 32 EAST
N.M.P.M. LEA COUNTY



GPS #	ARTESIA AERATION LLC	SECTIONS 5, 6 AND 7
32°-51'-17.1"N		TOWNSHIP 17 SOUTH, RANGE 32 EAST
103°-47'-56.9"W		N.M.P.M., LEA COUNTY, NEW MEXICO
ELEVATION: 4039		RODEO ENVIRONMENTAL


T. 17 S.
12 6
13 7
6
FENCE
LAND FARM CELLS
#1
#2
#3
#4
#5
#6
S89°48'20" E
765.75
S15°06'17" E
155.43
N89°55'100" E
659.52
GATE
OFFICE
PROPOSED OFFICE EXPANSION
PROPOSED NEW ACCESS ROAD
US HIGHWAY 82
NOT TO SCALE
13 7
7
8
R R
31 32
E E
ROW FENCE
PROPOSED NEW CALICHE MAIN ACCESS ROAD
PROPOSED NEW OFFICE EXPANSION

RECEIVED
JAN 26 2009
Environmental Bureau
Oil Conservation Division

Groundwater Investigation Report
Artesia Aeration
Lea County, New Mexico

Prepared for **Artesia Aeration**
1718 W. Millen Dr.
Hobbs, NM 88242

December 8, 2008

Daniel B. Stephens & Associates, Inc.
6020 Academy NE, Suite 100 • Albuquerque, New Mexico 87109

Groundwater Investigation Report
Artesia Aeration, Lea County, New Mexico

1. Introduction

This report summarizes the field investigation conducted by Daniel B. Stephens & Associates, Inc. (DBS&A) in November 2008 to characterize the source and extent of shallow groundwater encountered in monitor well MW-2 at the Artesia Aeration landfarm (Site). The Site is located on the north side of U.S. Highway 82 approximately one mile west of Maljamar, New Mexico in Section 7, Township 17S, Range 32E, Lea County, New Mexico (Figure 1).

2. Background

Several previous investigations have been conducted at the Site. In 1999, monitor well MW-D1 was installed near the entrance to the landfarm. Subsequent investigations in 2005 and 2007 included the installation of monitor wells MW-1, MW-2, and soil borings 3 and 4, and the installation of monitor well MW-3, respectively. None of the monitor wells or soil borings installed at the Site during these investigations yielded water except MW-2, which is located south of landfill cells 5 and 6 (Figure 2) The well was determined to contain water at the time of installation and it continues to contain water to date.

A search of New Mexico State Engineer Office and US Geological Survey records by another consultant did not locate any water wells within two miles of the Site (Safety & Environmental Solutions, 2008). Because of the uncertainty associated with the origin of the groundwater encountered in monitor well MW-2, the New Mexico Oil Conservation Division Environmental Bureau requested that Artesia Aeration determine the source and extent of groundwater in MW-2 prior to submission of a new permit for expansion of the facility.

In an attempt to characterize the extent and source of the groundwater, employees of Artesia Aeration dug trenches on the north, east, and south sides of MW-2. The trenches were dug with a trackhoe to depths of approximately 38 to 40 feet below ground surface (ft bgs) and allowed to stand open overnight. A total of seven trenches were dug: two on the north, one on the east, two

on the south, and two to the southeast. Standing water (<1 ft) was found to be present in the bottom of the closest trenches dug on the north and south sides of MW-2. The trench on the east side was wet, but did not contain any standing water. The trenches were backfilled and regraded after several days. No compaction of the soils was performed during backfilling. The area is currently devoid of vegetation and has settled in several locations producing topographically low lying spots where surface water can potentially pond. In addition, the regrading has produced a significant topographic low between monitor well MW-2 and landfill cell 6 where runoff of surface water from cell 6 accumulates. Photos of the general area around MW-2 are included in Appendix A.

DBS&A was subsequently contracted by Artesia Aeration in October 2008 to complete the groundwater investigation in the vicinity of monitor well MW-2. The field activities described herein were performed by DBS&A from November 3 through 5, 2008. A final site visit was made on December 2, 2008 to gauge current water levels after the well survey was completed A summary of the field investigation and conclusions are provided in Sections 3 and 4 below. Field notes recorded during the investigation are included in Appendix B.

3. Field Investigation

From November 3 through 5, 2008, DBS&A conducted a soil boring investigation at the Site in the vicinity of monitor well MW-2. A total of 15 soil borings were installed with a track-mounted Geoprobe 6620DT (Figure 2). The initial soil borings were installed at a distance of 20 ft from monitor well MW-2 on the north, south, east, and west sides If water was encountered in the closest borings, additional borings were installed at greater distances outward from the initial borings until there was no water encountered in the boring. The soil borings were advanced to a minimum total depth of 25 ft bgs, or refusal, and allowed to stand open overnight to determine whether water would enter the boring. The grid system established for identifying the soil borings was based on an arbitrary north defined as the entrance to the Site. Therefore, east was toward Highway 82; west was toward landfill cells 5 and 6; and south was toward Artesia (Figure 2).

Each boring was continuously cored using 4 ft long plastic sleeves that were inserted into the steel Geoprobe push rods. Lithologic descriptions of the recovered core were completed in the field by the geologist and are included in the field notes in Appendix B. Due to the trenching

conducted around MW-2 by Artesia Aeration, the lithologic descriptions contained in the field notes are considered to not be representative of actual subsurface lithologic conditions. The best description of the subsurface lithology in the area of investigation is considered to be that of MW-2 installed in May 2005 in undisturbed sediments. The log of MW-2 is provided in Appendix C. The shallow subsurface geology in the area of investigation consists mainly of sands, silty sands, and sandy clays with caliche underlain by consolidated and semi-consolidated fine-grained sedimentary deposits consisting of claystones, mudstones, and clay.

At the time of the field investigation, DBS&A observed evidence of ponded water behind the southern berms of cells 5 and 6 (Figure 2), in the topographic low between MW-2 and landfill cell 6, and in several other low lying spots around MW-2 that have resulted from settling of the backfilled trenches.

3.1 Extent of Groundwater

The results of the soil boring investigation showed that groundwater in the vicinity of MW-2 is perched and of limited areal extent. The extent of perched groundwater is shown in Figure 2. Of the 15 soil borings installed during the investigation, water was encountered in nine of them (Table 1). Soil boring W20 sloughed in overnight and was not redrilled. The initial water levels gauged in the open borings after standing open overnight are shown in Table 1.

The six dry borings defined the extent of the perched groundwater to the north, east, southeast, and south (Figure 2). The perched groundwater was determined to extend from beneath landfill cells 5 and 6 toward Highway 82 for a distance of less than 80 ft (boring E40 contained water; E80 did not contain water). To the south of MW-2, the perched groundwater extends approximately 80 ft. When boring S80 was drilled, it was initially found to contain water, but after a few days went dry. This likely indicates that the boring is located on the outer fringes of the perched groundwater. To the north along the access road, the perched water extends less than 20 ft (boring N20 did not contain water). The extent of perched groundwater beneath landfill cells 5 and 6 was not determined due to site constraints and the inability to drill through landfill cell contents. Both soil borings installed between cells 5 and 6 (W40 and W90) contained significant amounts of water.

3.2 Monitor Well Installation and Survey

Three of the soil borings containing water were completed as monitor wells and designated MW-W40, MW-E40, and MW-S40 (Figure 2). MW-W40 was completed to a total depth of 27 ft bgs, MW-E40 was completed to a total depth of 28 ft bgs, and MW-S40 was completed to a total depth of 26 ft bgs. Each of the wells was constructed of 10 ft of 1-inch, flush-threaded, machine-cut, 0.020-inch slot, Schedule 40 (SCH 40) PVC well screen and 1-inch, flush-threaded, SCH 40 PVC blank casing to the surface. A 10-20 silica sand filter pack was placed in the annulus from the bottom of the boring to 2 ft above the top of the well screen. A minimum 2-feet-thick activated bentonite chip seal was then installed on top of the filter pack. The remaining annulus was filled with a cement/bentonite grout. The wells were each completed at the surface within a 12-inch, flush-mount, traffic-grade well vault. A 2-foot-diameter by 6-inch-thick concrete pad was then poured around the well vault to ensure that the wells are not disturbed.

After the wells were installed, the x and y coordinates and the top of casing elevations were surveyed by Asel Surveying & Consulting of Hobbs, New Mexico, a New Mexico registered land surveyor. Existing monitor well MW-2 was resurveyed with the three newly installed wells. The survey results are presented in Table 2.

3.3 Groundwater Elevations

On December 2, 2008, DBS&A personnel measured the depth to water in monitor wells MW-2, MW-W40, MW-E40, and MW-S40. Table 3 summarizes water level measurements and perched groundwater elevations. A map showing the surface of the perched groundwater was prepared using the water level measurements and perched groundwater elevations and is provided in Figure 3. The direction of perched groundwater flow in the vicinity of MW-2 is to the south (from landfill cells 5 and 6) at a gradient of approximately 0.036 foot per foot (ft/ft).

It is not known how the trench excavation conducted by Artesia Aeration affected the original extent and flow of perched groundwater in the vicinity of MW-2, but it is apparent that a "bathtub-type" condition is present in the vicinity of MW-2 and is at least partially a result of the excavation as numerous low lying areas were produced from settling after backfilling.

4. Conclusions

The results of the investigation indicate that groundwater encountered in MW-2 is perched and of limited areal extent. The direction of flow is to the south (from cells 5 and 6) at a gradient of approximately 0.036 ft/ft. The perched groundwater is a result of the infiltration of surface water from two sources: (1) precipitation and (2) irrigation for landfarm operations

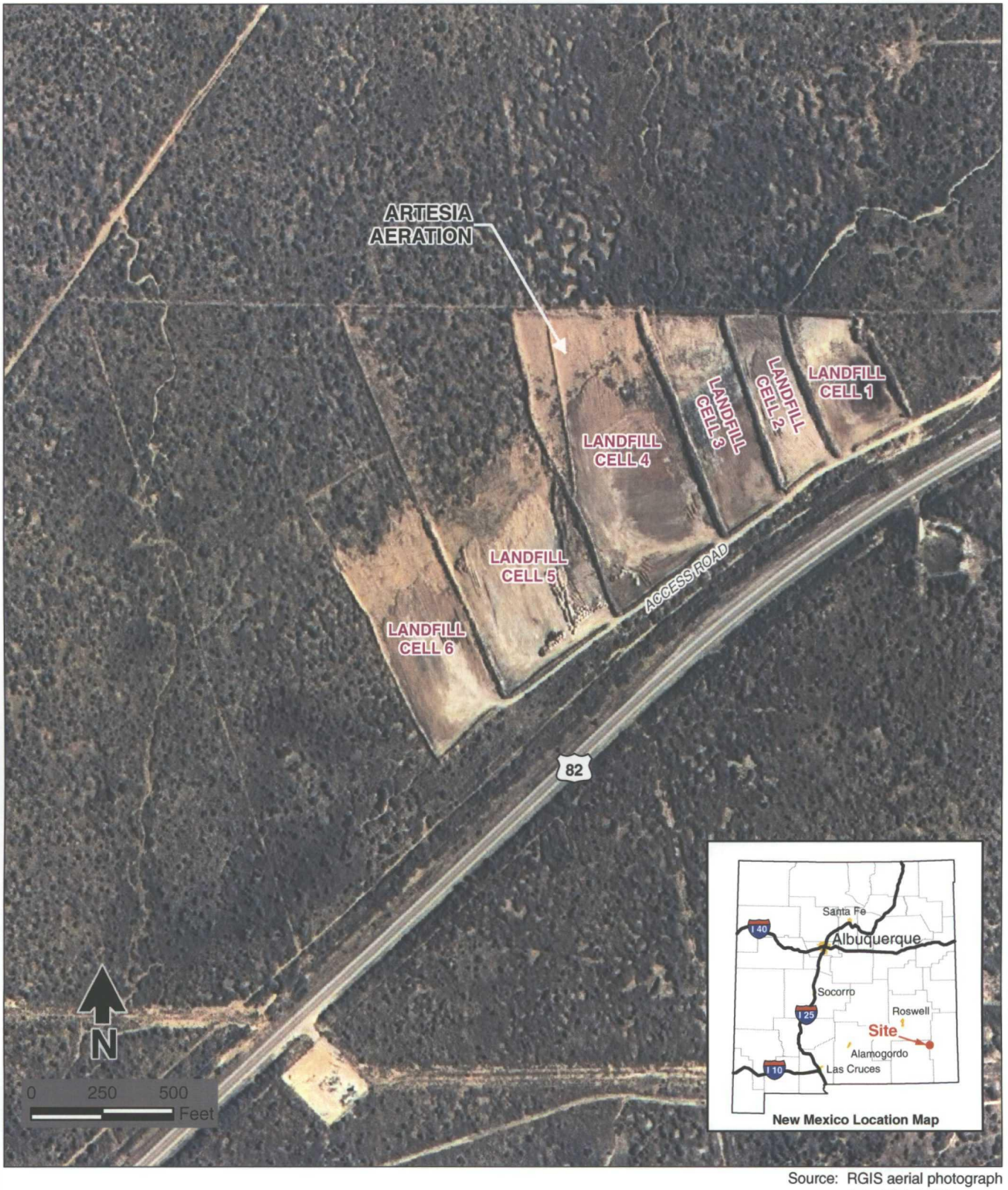
In cells 5 and 6, surface water from precipitation flows to the south where it ponds behind the berms upgradient of MW-2. There the water infiltrates and is held in the "bathtub-type" condition by the underlying fine-grained sediments. The report submitted by Safety & Environmental Solutions, Inc. (2008) indicated that the water level in MW-2 "appears to fluctuate depending on the amount of precipitation, especially heavier precipitation related to summer thunderstorms".

Water that is applied to the surface of cells 5 and 6 during landfarm operations (approximately every 2 weeks) also contributes to the perched groundwater by infiltration and surface flow. Excess water that infiltrates into the subsurface flows hydraulically downgradient where it is also held in the "bathtub-type" condition by the underlying fine-grained sediments. Likewise, excess water applied to the surface of the cells will run off and accumulate either behind the berms or in the topographic low between MW-2 and cell 6, and there infiltrate.

5. References

Safety & Environmental Solutions, Inc. 2008. Groundwater Investigation Report, Artesia Aeration, Section 7, Township 17S, Range 32E, Lea County, New Mexico. January 2008.

Figures



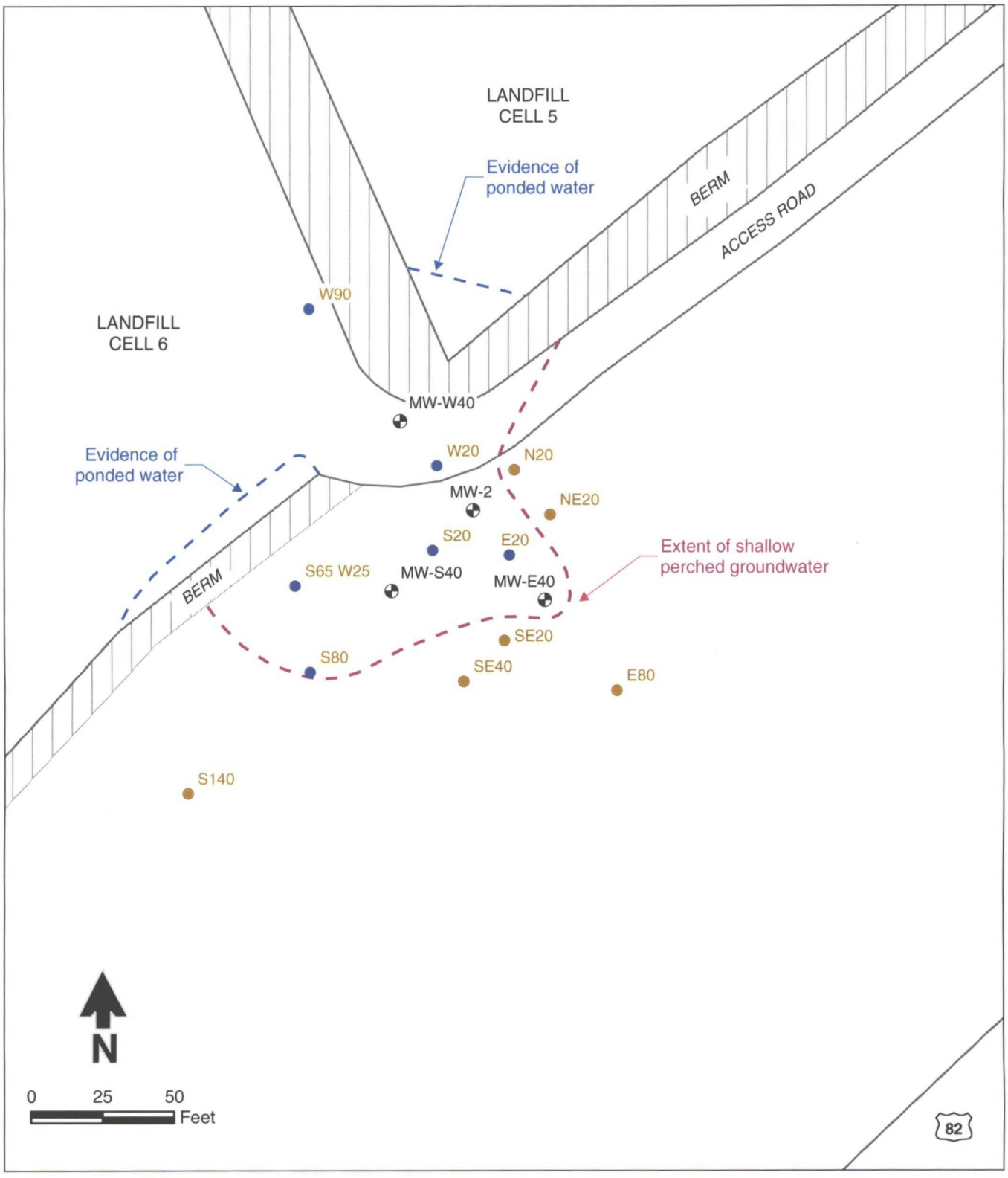
Source: RGIS aerial photograph dated July 2005

S:/PROJECTS/ES08.0173_ARTESIA_AERATION/GIS/MXDS/SITE_LOCATION_MAP.MXD 804021

ARTESIA AERATION
Site Location Map

Daniel B. Stephens & Associates, Inc.
12/04/2008 JN ES08.0173.00

Figure 1



Explanation

- Monitor well
- Soil boring (containing water)
- Soil boring (dry)

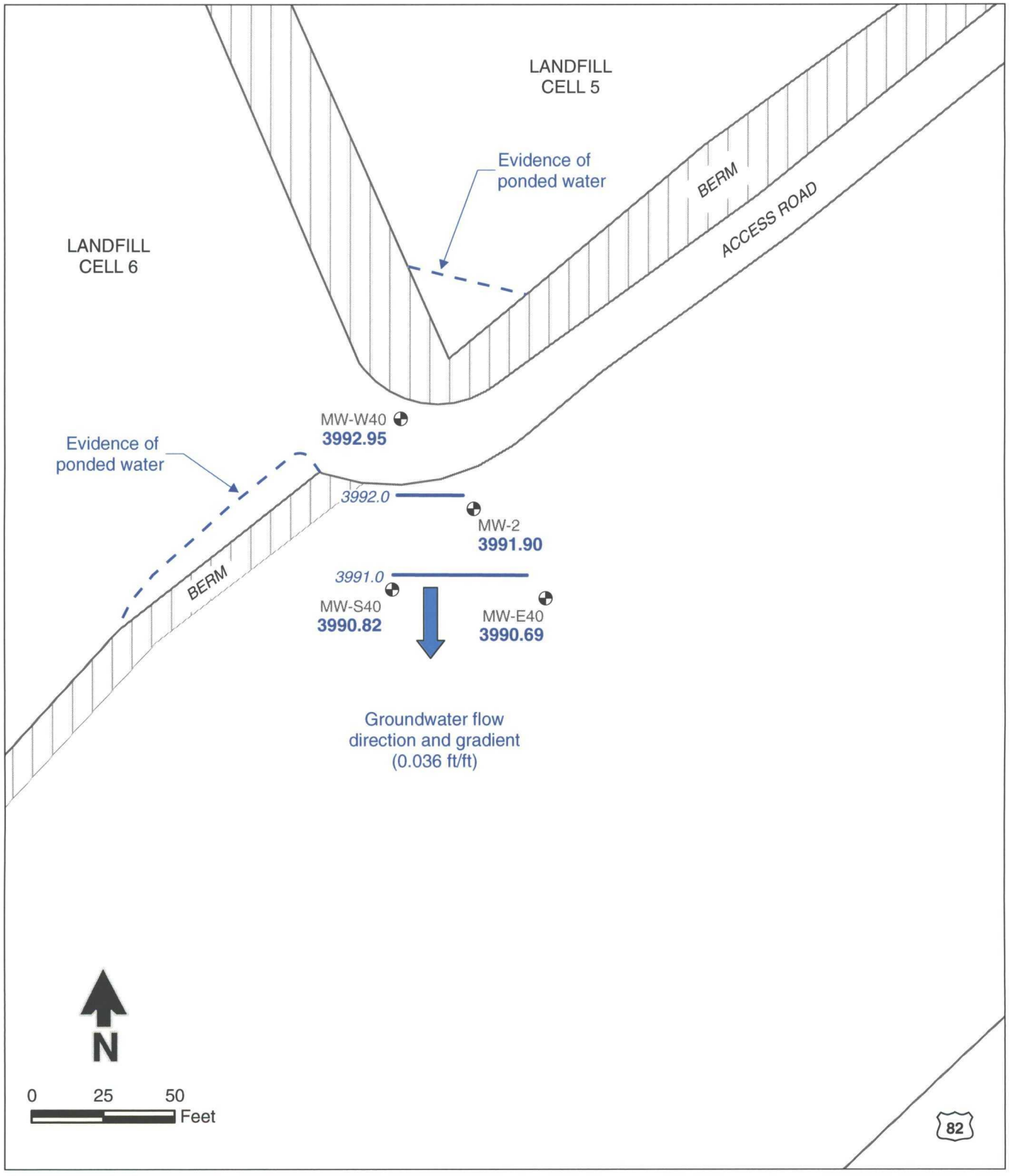
S:/PROJECTS/ES08.0173_ARTESIA_AERATION/GIS/MXDS/SAMPLE_LOCS.MXD 805021

ARTESIA AERATION

Soil Boring and Monitor Well Locations

Daniel B. Stephens & Associates, Inc.
12/05/2008 JN ES08.0173.00

Figure 2



Explanation

MW-2 Well designation

3991.90 Potentiometric surface elevation (ft msl)

Monitor well

Potentiometric surface elevation contour (ft msl)

ARTESIA AERATION

Perched Groundwater Elevations December 2, 2008

Daniel B. Stephens & Associates, Inc.

12/05/2008 JN ES08.0173.00

Figure 3

S:/PROJECTS/ES08.0173_ARTESIA_AERATION/GIS/MXDS/GWE_2008_DEC.MXD 804021

Tables

Table 1. Summary of Soil Boring
Artesia Aeration, Lea County, New Mexico
Page 1 of 1

Soil Boring Designation	Total Depth (ft bgs)	Depth to Water (ft bgs)
N20	26	Dry
NE20	28	Dry
W20	24	--- [a]
W40	28	17.87
W90	28	16.62
E20	24	20.86
E40	27	20.80
E80	27	Dry
SE20	32	Dry
SE40	23	Dry
S20	29	20 09
S40	26	20 88
S80	24	22 14
S140	22	Dry
S65 W25	23	22.91

ft msl - Feet above mean sea level
[a] Soil boring sloughed in overnight to 19 ft bgs and was not redrilled.

Table 2. Survey Results, NM East Zone - NAD 83
Artesia Aeration, Lea County, New Mexico
Page 1 of 1

Well Designation	Northing	Easting	Top of Casing Elevation (ft msl)
MW-2	674142.45	703945.24	4015.60
MW-E40	674111.33	703970.32	4011.38
MW-S40	674114.45	703916.73	4011 56
MW-W40	674173.29	703919.66	4011 24

ft msl - Feet above mean sea level

Table 3. Summary of Water Level Measurements
Artesia Aeration, Lea County, New Mexico

Well	Screen Interval (ft bgs)	Top of Casing Elevation (ft msl)	Date Measured	Depth to Groundwater (ft btoc)	Groundwater Elevation (ft msl)
MW-2	15-25	4015.60	12/02/08	23.70	3991.90
MW-E40	18-28	4011.38	12/02/08	20.69	3990.69
MW-S40	16-26	4011.56	12/02/08	20.74	3990 82
MW-W40	17-27	4011.24	12/02/08	18.29	3992.95

ft bgs = Feet below ground surface
ft btoc = Feet below top of casing
ft msl = Feet above mean sea level

Appendices

Appendix A

Photographs

Photograph 1
Regraded area around MW-2 (view to the east).

Photograph 2
MW-2 with the berm Cell 5 in the background (view to the northeast).

Photograph 3
Topographic low between MW-2 and Cell 6 (view to the northwest).

Photograph 4
Regraded area with MW-2 at the center (view to the west).

Photograph 5
Regraded area with Cell 6 in the background (view to the northwest).

Photograph 6
Regraded area with the southern berm of Cell 6 to the left in the photograph and the southern and western berms of Cell 5 in the background behind the truck (view to the northeast).

Appendix B

Field Notes

9/3/08 — S, MM

0900 Onsite: Mike McVey, Louis Trevino & Jerome Fisher.

0910 Tailgate Health & Safety Meeting. Topics Include Pinch Points, Slip Trips & Fall Hazards, & Overhead Hazards Associated W/ Geoprobe Activities. Mostly Overcast, Breezy, 61°

0920 MW-02 DTW = 23.35' btoc
TD = 28.30' btoc

0930 Pin Flags Set At 20' & 40' In 4 Directions (N, S, E, & W).

0942 ~~S~~ S-20 5YR4/6 — 0-4' Core, 1.3' Recovery
0-0.9 Silty Sand w/ Clay, Yellowish Red, Some Caliche Fragments, Sand is V. Fine To Fine Grained, Well Graded, SL Plastic, Damp.
0.9-1.3 Silty Sand, Well Graded, V. Fine To Fine Grained, Damp, Yellowish Red 5YR5/6.

0950 4-8' Core, 2.0' Recovery
4.0-4.6 Silty Sand As Above
4.6-5.0 Sand w/ Clay, Sand is V. Fine Grained, V. Pale Brown 10YR 8/2

11/3/08 4

4.6-5.0 Cont
Well Graded, Dry To Damp.
5.0-6.0 Silty Sand, ~~Br~~ Reddish ~~Brown~~ Yellow 5YR 6/6, Dry To Damp, Darkening In Color To Yellowish Red 5YR 5/8 At 6.0'.
1000 8-12' Core, 2.1' Recovery.
Silty Sand w/ Gravel (Up To 1½"), Sand is V. Fine To Fine Grained, Pink 5YR 7/4, Gravels Are Angular & Granitic. Some Caliche Nodules
1005 12-16' Core, 0.3' Recovery,
Silty Sand As Above. Sleeve Is Pinched Off & Twisted At Bottom.
1020 16'-20' Core, 3.8' Recovery
16.0-17.3 ~~20-21.3~~ Silty Clayey Sand, Sand Is V. Fine To Fine Grained, Reddish Yellow 5YR 6/6, Well Graded, Damp.
17.3 ~~21.3~~ - 19.8 Sandy Clay, Sand is V. Fine To Fine Grained, Red 2.5YR 4/6, Hard, Sl Plastic, Dry To Sl Damp Some Caliche Fragments Throughout, Gravels Up To ½" At 19.0', Angular

11/3/08 5

17.3 - 19.8 Cont
To Subrounded, Granitic & Caliche Nodules Increasing W/ Depth.
1035 20'-24' Core, 0.5' Recovery
~~Clayey~~ Sandy Clay As Above.
1057 20'-24' Core, 3.9' Recovery
20.0 - 20.4 Sandy Clay As Above, Damp
20.4-25.5 Clayey Sand w/ Gravel (Up To 1"), Gravels Are Angular To Subrounded, Granitic & Limestone, Sand is V. Fine To Fine Grained, Red 2.5YR 4/8, Hard, Sl Plastic, Dry To Damp.
25.5-27.0 Clayey, Gravelly Sand w/ Caliche, Gravels Are Limestone & Granitic, Sand is V. Fine To Fine Grained, Well Graded, Red 2.5YR 4/8, Dry To Damp.
27.0-27.9 Sandy Clay, Sand is V. Fine To Fine Grained, Reddish Brown 2.5YR 4/4, Sl. Plastic, Hard, Damp.
1110 24-28' Core, 2.8' Recovery
24.0-26.8 Sandy Clay, Sand is V. Fine To Fine Grained, Reddish Brown 2.5YR 4/4, Sl. Plastic, V. Hard, Greenish Gray Mottling Grey 2 4/1. Some Gravels

11/3/08 J

24.0-26.8 Cont
Up To 1/4", Rounded To Subrounded
Dry To Damp
1120 28.0'-29.5' Core, 1.3' Recovery,
Sandy Clay As Above, Dry.
1130 TD = 29'
1137 15' of 1" Screen & 15' of 1"
Casing Placed In Hole.
1141 Begin on E-20.
1145 0-4' Core, 1.75' Recovery.
0-1.75 Silty Sand w/ Clay & Gravel
(Up To 3/4"), Gravel is Limestone,
Sand is V. Fine To Fine Grained,
Yellowish Red 5YR5/6, Well Graded,
Damp.
1150 4'-8' Core, 1.75' Recovery,
4.0-5.1 Silty Sand w/ Clay As Above.
5.1-5.75 Caliche, Hard, Indurated
1155 8'-12' Core 3.8' Recovery
8'-9.75' ~~Recovered~~ V. Fine Sand w/ Caliche
9.75'-11.8' Same As Above w/ Decreasing
Caliche Content & Increasing Sand.
1205 12'-16' Core, 1.25' Recovery
12.0-13.25 Silty ~~Sand w/ Gravel~~ Gravelly Sand,
(Up To 1 1/4"), Limestone & Granitic

11/3/08 F

12-13.5 Cont
Gravels, Sand is V. Fine To
Fine Grained, Well Graded,
Pink 5YR 8/3, Damp.
1217 16-20' Core, 4' Recovery
16.0-16.9 Silty Gravelly Sand
As Above
16.9-19.5 Silty Clay w/ Sand,
Lt. Red 2.5YR 6/6, Well Graded,
Plastic, Hard, Damp To 17.5
Moist From 17.5-19.5
19.5-20.0 Caliche w/ Gravel
Up To 1", Angular To Subangular,
Limestone & Granitics, Dry.
1224 20'-24' Core, 0.3' Recovery
20.0-20.3 Clayey Sand w/ Gravel
Up To 3/4", Sand is V. Fine To
Fine, Red 2.5YR 4/8, Well
Graded, ~~Damp To Moist~~, Dry To Damp.
1240 TD = 24'
1242 ~~M~~ S-20 Dry To 29.56' btoc
1244 15' of 1" Screen & 10' of
1" Casing Set In Hole.
1300 Begin on N-20

11/3/08 3

1303 0'-4' Core, 2.3' Recovery
0-2.3 Silty Sand, Sand is V. Fine To Fine Grained, Yellowish Red 5YR 5/6, Damp

1308 4-8' Core, 3.0' Recovery
4.0-4.5' Silty Sand, As Above
4.5-5.3' Sandy Clay w/ Caliche, Sand is V. Fine To Fine Grained, Pale Yellow 2.5Y 8/2, Well Graded, Hard to Sl. Plastic, Damp
5.3-7.2 Silty Sand w/ Clay, Well Graded, Sand is V. Fine To Fine Grained, Lt. Brown 7.5YR 6/4 Darkening w/ Depth To Yellowish Red 5YR 5/6 At Bottom, Damp.

1315 8'-12' Core, 3.1' Recovery
8.0-9.3' Silty Sand w/ Clay As Above.
9.3'-11.1' Silty Sand w/ Clay, Caliche At 9.3' decreasing w/ Depth, Well Graded, Damp To Moist.

1323 12'-16' Core, 3.1' Recovery
12.0'-14.2' Silty Sand w/ Gravel

11/3/08 4

12.2-14.2 Cont
Up To 3/4", Gravel Content & Size Increases w/ Depth, Pink 7.5YR 7/4, Well Graded, Damp
14.2'-15.1' Silty Sand, Sand is V. Fine To Fine Grained, Well Graded, Reddish Yellow 5YR 6/6, Damp To Moist.

1330 16'-20' Core, 4' Recovery
16.0-16.8 Silty Sand As Above
16.8-19.2 Silty Clayey Sand, Sand is V. Fine To Fine, Red 2.5YR 5/6, Well Graded, Hard, Sl. Plastic, Dry To Damp.
19.2-19.7 Gravelly Clay, Gravel is Up To 1 1/4", Limestone, Clay is V. Hard, Plastic, Red 2.5YR 4/6, Dry To Damp.
19.7-20.0 Sandy Clay, Sand is V. Fine To Fine Grained, Clay is V. Hard, Plastic, Red 2.5YR 4/6 w/ Green Gray Mottling, Dry To Damp.

1340 20'-24' Core, Sandy Clay As Above

11/3/08 J

1344 24-28' Core, 0.6' Recovery
24.0-24.6 Sandy Clay As Above.

1351 TD=26' (N-20)
E-20 DTW = Dry to 25.35'

1400 Begin on W-20

1405 0-4' Core, 3.9' Recovery
0-0.5 Silty Sand w/ Gravel (up to 1/2") Well Graded, Lt Brown 7.5YR6/3 Dry to Damp, Sand is V. Fine To Fine Grained,
0.5-3.9' Silty Sand, Sand is V. Fine To Fine Grained, Well Graded, Yellowish Red 5YR 5/8, Damp Some Black Mottling.

1410 4-8' Core, 2.4' Recovery
4.0-4.6 Silty Sand As Above w/ Some Clay, Sl. Plastic, Sl. Hard.
4.6-5.3 Sandy Clay w/ Caliche, Sand is V. Fine To Fine, Pale Yellow 5Y 8/2, Dry to Damp, Well Graded,
5.3-6.1 Silty Sand w/, V. Fine To Fine Grained Pale Yellow 2.5Y 7/4, w/ Increasing Sand & Decreasing Caliche w/

11/3/08 J

5.3-6.1 Cont.
Depth. Damp
6.1-6.4 Silty Sand w/ Cont'y, Sand is V. Fine To Fine Grained, Yellowish Red 5YR5/8, Well Graded, Damp

1419 8-12' Core, 3.0' Recovery
8.0-9.0 Silty Sand w/ Clay As Above.
9.0-10.25 Silty Sand w/ Gravel Up to 3/4", Angular To Subangular, Limestone & Granitic Gravels, Well Graded, Reddish Yellow 5YR 6/6, Damp
10.25-11.0 Silty Sand As Above w/ Us Gravel.

1424 12'-16' Core, 4.0' Recovery
12.0-12.6 Silty Sand As Above
12.6-14.5 ~~Silty, Clayey Sand w/~~ Silty Sandy Clay w/ Caliche, Sand is V. Fine, Well Graded, Sl Plastic, Sl Hard, Pink 7.5YR8/3 Decreasing Caliche w/ Depth.
14.5-16.0 Silty, Sandy Clay, Sand is V. Fine Grained, Red 2.5YR 5/6

11/3/08 — 4

14.5-16 X ONT
PLASTIC, SOFT, MOIST
1432 16'-20' CORE, 4' RECOVERY
16.0-18.0 SILTY SANDY CLAY AS ABOVE.
18.0-20.0 SANDY CLAY, SAND IS V. FINE TO FINE, V. HARD, PLASTIC, RED 2.5YR 4/6, GREEN-GRAY MOTTLING, DRY TO DAMP
1444 20.0-24.0' CORE, 3.9' RECOVERY
20.0-22.0 SILTY, GRAVELLY SAND, GRAVEL W/ CLAY NODULES, SAND IS V. FINE TO COARSE GRAINED, GRAVEL IS UP TO 1 1/4", LIMESTONE & GRANITIC GRAVELS, CALICHE DECREASING & CLAY INCREASING W/ DEPTH, DRY TO DAMP
22.0-24.0 SANDY CLAY W/ GREEN GREY MOTTLING, SAND IS V. FINE TO FINE GRAINED, V. HARD, PLASTIC, RED 2.5YR 4/8, DRY TO SL DAMP
1450 TD=24'
25' OF 1" PVC SCREEN

11/3/08 — 5

WELL	DTW	TIME
S-20	DRY TO 29.56' btoc	1501
E-20	DRY TO 25.58' btoc	1503
N-20	DRY TO 30.19 btoc	1504
W-20	DRY TO 24.89 btoc	1506

1508 BEGIN ON W-40
1510 0-4' CORE, 3.1' RECOVERY
0-0.5 SILTY SAND W/ GRAVEL UP TO 1" (CALICHE), WELL GRADED, DRY TO DAMP
0.5-3.1 SILTY SAND, V. FINE TO FINE GRAINED, WELL GRADED, YELLOWISH RED 5YR 5/6, LIGHTER W/ INCREASING DEPTH TO REDDISH YELLOW 7.5YR 6/6, DAMP
1517 4-8' CORE, 1.8' RECOVERY
4.0-4.5 SILTY SAND AS ABOVE
4.5-5.8 SILTY SAND W/ CLAY & CALICHE, SAND IS V. FINE TO FINE GRAINED, V. PALE BROWN 10YR 8/3, WELL GRADED, DRY TO DAMP
~~5.7-5.8~~
1527 8'-12' CORE, 2.6' RECOVERY
8.0-10.6' SILTY, CLAYEY SAND;

11/3/08 J

W-40 8.0-10.6 CONT
SAND is V. FINE TO FINE GRAINED, WELL GRADED, REDDISH YELLOW 5YR 6/8, DAMP

1527 12'-16' CORE, 3.8' RECOVERY,
12.0-12.5 SILTY CLAYEY SAND AS ABOVE
12.5-13.5 SANDY CLAY W/ CALICHE NODULES & GRAVELS UP TO 1/2", SAND IS V. FINE, RED ~~CLAY~~ 2.5YR 4/6
13.5-15.8' SAME AS 8.0-10.6 W/ CALICHE NODULES.

1537 16-20' CORE, 3.5' RECOVERY
16.0-16.7 SILTY SAND W/ GRAVEL, ~~SA~~ (UP TO 1/2"), SAND IS V. FINE GRAINED
16.7-18.5' CLAY W/ SAND, V. HARD, ~~32~~ PLASTIC, RED 2.5YR 4/6, DRY TO DAMP

TD = 19.25'
W 20' OF 1" PVC SCREEN.

11/3/08 F

1550 BEGIN ON S-40

1553 0-4' CORE, 0.9' RECOVERY
0-0.9' SILTY SAND W/ GRAVEL UP TO 1/2", CALICHE FROM 0.6-0.7, REDDISH BROWN 5YR 5/4, WELL GRADED, DRY TO DAMP, INCREASING MOISTURE W/ DEPTH TO DAMP AT BOTTOM.

1555 4'-8' CORE NO RECOVERY

1558 8-12' CORE, 1.8' RECOVERY
8.0-8.8 SAME AS 0-0.9 DRY TO DAMP W/ SM. CALICHE NODULES,
8.8-9.8' SILTY SAND W/ CLAY & CALICHE, GRAVEL UP TO 3/4" FROM 9.2 TO 9.6, V. PALE BROWN 10YR 8/2, WELL GRADED, DRY TO DAMP

1607 12'-16' CORE, 1.5' RECOVERY
12.0-13.5 SAME AS ABOVE

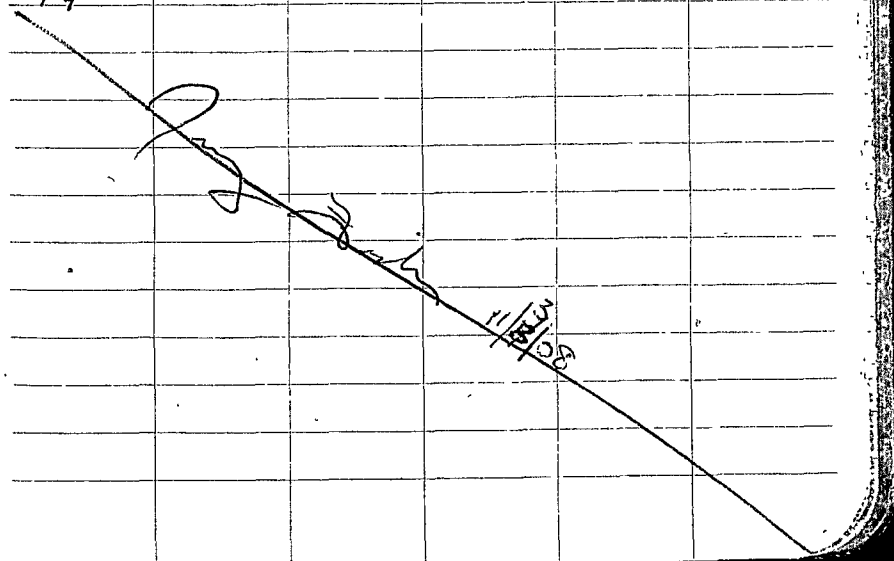
1620 16-20' CORE, 3.6' RECOVERY
16.0-17.1 SILTY SAND W/ CLAY AS ABOVE W/ CALICHE NODULES
17.1-19.6 CLAY W/ V. FINE SAND, V. HARD, PLASTIC, RED 2.5YR 4/6

11/3/08 F

17.1-19.6 Cont
DRY, Lt Brown Mottling & Small Black Nodules,
1632 20'-21.5' Core, 1.3' Recovery
20.0-21.3' Same As Above
TD = 21.5'
1645 Begin On E-40
1648 0-4' Core, 1.3' Recovery
0-1.3' Silty Sand w/ Clay & Gravel up To 3/4", Sand is V. Fine To Fine Grained, Dry To Damp At Bottom
1650 4'-8' Core, No Recovery
1653 8'-12' Core, No Recovery, V. Soft Sand
1655 12'-16' Core, 0.9' Recovery, V. Soft
12.0-12.6' As Above
12.6-12.9', Caliche Stnd & Gravel
No Pen. 16.0 12.9 12.7 12.7-12.9 Same As 12.0-12.6
1716' - 20' Core, 1.3' Recovery
16.0-17.3 Silty Sand w/ Clay & Gravel up To (1/2") Sand is V. Fine To Fine Grained, Increasing Moisture With Depth From Damp To Wet At 17'.

11/3/08 F

16.0-17.3 Cont
Well Graded, Yellowish Red 5YR 4/6,
1702 20'-24' Core, 2.3' Recovery
20.0-20.3 Silty-Sand w/ Gravel up To 1", & Caliche Nodules, Yellowish Red 5YR 4/6, Well Graded, Wet
1706 24'-28' Core, 2.6' Recovery
24.0-26.6 As Above w/ (Green-Grey Nodules), Wet
Tooling Will Be Left In The Hole Overnight To Keep The Hole Open.
1720 Offsite



11/4/08 — F.

0845 Onsite

0850 Tailgate Safety Meeting, Those Present Include Louis Trujillo + Jerome Fisher.

0855 Check Water Levels In All Borings

Time	Well	DTW('bgs)	TD('bgs)	
0855	W-40	Dry	20.14	
0856	W-20	Dry	24.89	
0858	S-20	22.56	29.56	
0900	S-40	Dry	21.30'bgs	Open Borehole
0906	E-20	21.83	25.09	
0910	E-40	27.21	28.38	
0914	N-20	Dry	30.19	

0940 Pulled Temporary Well From W-20. Bottom 4" Broke Off In Hole. TD = 20.23'bgs

0945 Pulled Temporary Well From W-40. TD = 19.35'bgs

0949 Pulled Temporary Well From N-20. TD = 20.09'bgs

0950 Rods Pulled From E-40. 6-5' Sticks Of 1" Slotted PVC Installed.

11/4/08 — F

0955 Gauge W-20. The Bottom 2.5' Of Screen That Came Out Of The Hole Was Muddy, High Clay Content Mud, However No Accumulated Water In The Well Or The Borehole. TD = 20.23'bgs

0958 Gauge W-40, TD = 19.35'bgs No Mud On Tip Of Probe.

1002 Gauge N-20, TD = 26.09'bgs No Mud On Tip Of Probe.

1004 Return To S-40 To Try For 5' More Depth.

1017 Refusal @ ~~30~~ 26'.

1025 21.5-25.5' Core, 2.5' Recovery

21.5 - ~~23.0~~ 23.6 Clay w/ Sand, Sand is V. Fine To Fine Grained, Red 2.5YR5/6, Hard, V. Plastic, To Damp To Moist, Bottom 0.2' Moist To V. Moist

23.0-23.5 Silty Sand w/ Clay & Gravel up To 1/4", V. Cuttings Red 5YR5/6, Sand is V. Fine To Med Grained, Well Graded, Wet

23.5-24.0' ~~Sandy Clay~~ Clayey Sand w/ Gravel

11/4/08 JF

23.5-24.0 Cont.
Vf to 3/4", Red 2.5YR 4/8, V. Hard, Non Plastic, M. Caliche Nodules, Dry

1045 Start on E-80

1049 0-4' Core, 2.5' Recovery
0-0.5 Silty, Clayey Sand, Sand is V. Fine to Fine Grained Strong Brown 7.5YR 4/6, Well Graded, Damp.
0.5-1.5 Silty Sand, Sand is V. Fine To Fine Grained, Well Graded Strong Brown 7.5YR 4/6, Damp
1.5-2.5 Same As 0-0.5 But Damp To Moist

1053 4-8' Core, 2.7' Recovery
4.0-4.5 Caliche, Hard, Indurated,
4.5-5.0 Pulverized Caliche & Silty Sand, V. Fine Grained Well Graded, Reddish Yellow 5YR 7/6, Dry to Damp
5.0-5.6 Clayey Sand, V. Fine Grained, Well Graded, ~~Reddish~~ Yellowish Red 5YR 5/6 Sl. Plastic, Dry to Damp

11/4/08 JF

5.6-6.7 Silty Sand w/ Caliche & Gravel Up to 1", Limestone & Granite Gravels, Sand is V. Fine To Coarse Grained, Well Graded Yellowish Red 5YR 4/6, Dry to Sl. Damp

1057 8-12' Core, 3.7' Recovery
8.0-9.8 As Above
9.8-10.7 Silty Sand, V. Fine To Fine Grained, Reddish Yellow 5YR 6/6, Well Graded, Damp

1103 12-16' Core, 3.3' Recovery
12.0-12.6' As Above
12.6-13.3 As Above w/ Gravel up To 1", Limestone & Granite Gravels,
13.3-15.3 Silty Sand w/ Clay & Caliche, Sand is V. Fine to Fine Grained, Well Graded, V. Pale Brown 10YR 8/2, Darkening in Color To Pink 7.5YR 7/3, Dry to Damp

1110 16'-20' Core, 3.8' Recovery
16.0-19.5' As Above w/ Sparse Gravels

11/4/08 F

16.0-19.5 Cont (E-80)

U.P. To 3½"

19.5-19.8 Silty Sand, V. Fine ~~Grained~~ To Fine Grained, Well Graded, Yellowish Red 5YR5/6, Damp To Moist

1120 20-24' Core, 3.9' Recovery

20.0-20.7' As Above

20.7'-23.0' Silty Clay w/ Sand. Sand is V. Fine Grained, Yellowish Red, 5YR5/6, Low Non Plastic, Hard, Damp

23.0-23.9 Sandy Clay, Sand is V. Fine ~~Grained~~, To Med Grained, ~~Dark~~ Red 2.5YR Red 2.5YR5/6, V. Hard, Plastic, Dry To Damp To 23.7. Increasing Moisture w/ From 23.7 To 23.9 To V. Moist.

1139 24'-27' Core, 2.5' Recovery, Refusal At 27'.

24.0-24.1 As Above

24.1-26.5 Clay w/ Some Fine Sand, Reddish Brown 5YR4/4, Lt Brown & Greenish Yellow

11/4/08 F

24.1-26.5 Cont (E-80)

Mottling, V. Hard, High Plasticity, Damp w/ ~~Some~~ Decreasing Moisture w/ Depth To Dry At Bottom.

1149 Check Water Levels

Time	Well	DTW (Bgc)	DTW bgs
1150	S-20	22.09	21.74
1152	S-40	Dry TD = 30.14 Bgc	Dry TD = 26.09 bgs
1150	E-20	21.82	20.56
1158	E-40	23.03	20.89

1225 Start on S-80

0-4' Core, 2.6' Recovery

0-0.5' Silty Sand w/ Clay, Sand is V. Fine To Fine, Caliche Nodules, Yellowish Brown 10YR 5/4, Well Graded, Damp

0.5'-2.6' Silty Sand, V. Fine to Fine Grained, Well Graded, Strong Brown 7.5YR5/8, Dry To Damp

1234 4-8' Core, 2.4' Recovery

4.0-5.3 As Above

5.3-6.4' As Above w/ Caliche At

11/4/08 — I

5.3-6.4 Cont (S-80)
5.3 & Decreasing w/ Depth
To 5.7. Caliche Nodules from
6.0 To Bottom.

1242 8.0-12' Core, 2.4' Recovery
8.0-8.5' Caliche, Hard, Indurated, Dry
8.5-10.4' Silty Sand w/ Clay &
Caliche Nodules, Sand is
V. Fine to Fine Grained,
Well Graded, Strong Brown
7.5YR 5/8, Caliche Nodules
Decreasing w/ Depth, Damp

1247 12-16' Core, 2.4' Recovery
12.0-13.2' Silty Sand w/ Clay & Caliche,
Sand is V. Fine to Fine
Grained, Decreasing
Caliche w/ Depth, Pinkish
White 7.5YR 8/2, Well Graded,
Dry to Damp.
13.2'-14.4' As Above w/ A Little
If Any Caliche, Color
is Reddish Yellow 5YR 7/6

1254 16-20' Core, ~~0.9'~~ Recovery
16.0-17.8' ~~Sandy Silty~~ Sandy
Clay, Sand is V. Fine

11/4/08 — J

16.0-17.8' Cont (S-80)
Grained, Well Graded, Red
2.5YR 5/6, V. Hard, & Plastic
Dry At Top, Damp At Bottom,
Increasing Clay Content
w/ Depth As Well As Plasticity.

1307 Refusal At 23.5'
20-24' Core, ~~Silty, Sandy Clay~~
~~As Above~~ 3.8 ~~4.0~~ Recovery
20.0-23.5 Sandy Clay As Above.
Refusal At Appx 23.5'
In Caliche w/ Limestone
& Granitic Gravels.

1319 Gage E-80
Dry, TD = 26.49' bgs
Tip of Probe is Dry.

1323 Gage S-80
Dry to 22.98' bgs
Tip of Probe Has Sandy Wet
Mud.

1338 Start on ~~E-40, S-40~~ SE-40

1340 0-4' Core, 0.5' Recovery
0-0.5' Silty Sand w/ Caliche
Nodules, Sand is V. Fine
To Fine Grained,

11/4/08 4

0-0.5 Co-F (SE-40)
Strong Brown 7.5YR 4/6, Well Graded, Dry At Top, Damp At Bottom.

1342 4'-8' Core, No Recovery.

1345 8'-12' Core, 1.9' Recovery
8.0-8.9 Silty Sand w/ Clay & Caliche Nodules, Sands V. Fine to Fine Grained, Well Graded, Strong Brown 7.5YR 4/6, Damp
8.9-9.6 As Above, But Color Is Red 2.5YR 4/6, Damp.
9.6-9.9 Silty, ~~Sandy~~ Clay w/ Sand & Caliche, Sands V. Fine, Pink, 7.5YR 7/4, Limestone & Caliche Gravels From 9.6-9.8 up To 1/2", Well Graded, Damp.

1353 ~~X~~ 12'-16' Core, 3.9' Recovery
12.0-15.5 As Above w/ No Gravels
15.5-15.9 Silty Sand, V. Fine to Fine Grained, Well Graded, ~~Lt Brown~~ Pink 7.5YR 7/4

1356 16'-20' Core, 3.9' Recovery

11/4/08 5

16.0-16.8 As Above
16.8-19.9 As Above w/ Clay Sz. Moist From 17.3-18.0 Otherwise Damp ~~+ Dry~~ ~~To Damp At Bottom~~.
Sz Plastic, Hard.

1401 20.0-22.5' Core, Refusal At 22.5'
In V. Hard Red Clay w/ Limestone & Caliche Gravels.
2.2' Recovery
20.0-21.4 As Above
21.4-22.5 As Above w/ Increasing Clay, ~~& Caliche~~, w/ Depth, Caliche, ~~Caliche Gyp~~ Limestone, Granitic, & Caliche Gravels up To 3/4".
No Disturbed Soils Encountered.

1410 Start on E40,520

1412 0-4' Core No Recovery
Very Soft, Possibly Fill.

1414 4-8' Core, No Recovery

1416 8'-12' Core, 1.6' Recovery
8.0-9.6' Silty Sand w/ Clay & Sparse Caliche

11/4/08 I

8-0-9.6' Cont (E40,520)
Gravels up to 3/4", Sand is V. Fine To Fine Grained, Well Graded, Brown 7.5YR 4/4, Damp
1425 12'-16' Core, 1.2' Recovery
~~1435~~ 12.0'-12.4' As Above
12.4'-13.2' Silty Sand w/ Gr. Clay ~~&~~, Caliche, & Limestone & Caliche Gravels up To 1", Caliche Nodules, Sand is V. Fine To Coarse Grained, Well Graded, Yellowish Red 5YR 4/6, ~~White Caliche At~~, Damp, Dry At Bottom w/ Increasing Sand Content w/ Depth.
~~1432~~ 1428 16'-20' Core, No Recovery
1432 20'-24' Core, 2.0' Recovery
20.0'-20.2' Gravel, Up To 1", Limestone & Caliche Gravels,
20.2'-22.0' Clay w/ Sand, Hard, Plastic Red 2.5YR 4/8, w/ Green, Black, & Lt Brown Mottling, Dry To S. Damp At Top w/ Decreasing Moisture w/ Depth.

11/4/08 J

1439 24'-28' Core, 3.8' Recovery
24.0'-27.8' As Above
1444 28'-32' As Above w/ Some Rose Sand.
~~TH~~ TD = 31.5' bgs
1458 Gauge Wells
1500 E-40 22.96' btoc
1512 E-80 Dry To 22.44 ft bgs N, Moisture on Tip of Probe
1515 S-80 22.49' bgs TD = 22.80' bgs
1510 Start on NE-20
1513 0'-4' Core, 1.4' Recovery
0-1.4' Silty Sand w/ Clay & Sparse Caliche Nodules, Sand is V. Fine To Fine Grained, Well Graded, Strong Brown 7.5YR 5/6, Dry At Top, Increasing Moisture w/ Depth To Damp At Bottom. SL Plastic
1519 4'-8' Core, 1.6' Recovery
4.0'-4.2' As Above
4.2'-5.6' As Above w/ Little To No Clay.
1526 8'-12' Core, 1.6' Recovery
8.0'-8.3' As Above

11/4/08 F

NE-20 CONT

8.3'-9.6' ~~CALICHE~~ AS ABOVE W/ CALICHE & WHITE. GRADUAL DARKENING TO REDDISH YELLOW 7.5YR 6/6 AT BOTTOM, DRY

1534 12'-16' CORE, 3.1' RECOVERY

12.0'-15.1' AS ABOVE BUT AT 12.3' COLOR CHANGES TO PINK 7.5YR 8/4 & AT 14.3' COLOR CHANGES TO RED 2.5YR 4/8.

1541 16'-20' CORE, 3.7' RECOVERY

16.0'-17.2' AS ABOVE

17.2'-19.7' SILTY SAND W/ CLAY & SPARSE GRAVELS UP TO 1/2", SUBROUNDED LIMESTONE, SAND IS V. FINE W/ SPARSE COARSE GRAINS, WELL GRADED, HARD, SL. PLASTIC, REDDISH YELLOW 5YR 7/6, DRY TO SL. DAMP

1548 20'-24' CORE, 3.9' RECOVERY

20.0'-20.3 AS ABOVE BUT COLOR IS RED 2.5YR 4/8

11/4/08 F

NE-20 CONT

20.3'-20.6 CLAYEY GRAVEL, UP TO 1", LIMESTONE & CALICHE GRAVELS, DAMP

20.6'-23.9' CLAY W/ SPARSE SAND & GRAVEL UP TO 1/2" MOD. HARD TO 22.5 THEN HARD, PLASTIC, RED 2.5YR 4/8 W GREENISH GRAY & LT BROWN MOTTLING. DRY TO DAMP.

1556 24'-28' CORE, 4.0' RECOVERY

24.0'-28.0' CLAY W/ SPARSE SAND & GRAVEL AS ABOVE. HARD.

TD = 28.0' bgs

1600 START ON SW-20

1603 0-4' CORE, 2.5' RECOVERY

0-2.5' SILTY SAND, V. FINE TO FINE GRAINED, WELL GRADED, STRONG BROWN 7.5YR 5/8, DRY AT TOP W/ INCREASING MOISTURE W/ DEPTH TO DAMP AT BOTTOM.

11/4/08 I

0-2.5 CONT (SW-20)
SOME CLAY NEAR BOTTOM.

1605 4'-8' CORE, 2.0' RECOVERY
4.0'-6.0' SILTY SAND W/ CLAY, SAND IS V. FINE TO FINE GRAINED, WELL GRADED, SL PLASTIC, STRONG BROWN 7.5YR5/8 & INCREASINGLY PALE W/ DEPTH TO PALE YELLOW 5Y 7/4 AT 5.2' AND THEN INCREASINGLY DARKENING TO YELLOWISH RED 5YR5/8, DAMP.

1615 8'-12' CORE, 3.4' RECOVERY
8.0'-8.5' AS ABOVE
8.5'-11.4' AS ABOVE, BUT AT 8.5', WEAKLY CALICHIFIED DARKENING W/ DEPTH TO REDDISH YELLOW 5YR7/6 AT 10.6'. SOME CALICHE NODULES TO BOTTOM.

1630 12'-16' CORE, 4.0' RECOVERY.
12.0'-13.6' SILTY SAND W/ LITTLE CLAY & SPARSE CALICHE GRAVELS UP TO 1/4" & SPARSE COARSE

11/4/08 II

12.0-13.6 CONT (SW-20)
SAND GRAINS, WELL GRADED, NON-PLASTIC, PINK 7.5YR8/4, DAMP
13.6'-16.0' SILTY SAND W/ CLAY & SPARSE LIMESTONE GRAVEL UP TO 1", SAND IS V. FINE TO FINE GRAINED, WELL GRADED, REDDISH YELLOW 5YR 7/6, DAMP

1635 16'-20' CORE, 3.9' RECOVERY
16.0-16.3 AS ABOVE
16.3-17.5 AS ABOVE BUT COLOR DARKENS TO RED 2.5YR4/8
17.5'-19.9' SANDY CLAY, SAND IS V. FINE, V. HARD, PLASTIC WHEN WET, RED 2.5YR5/6 W/ GRAY & LT/PALE BROWN MOTTLING, DRY TO SL. DAMP

1643 REFUSAL AT 21'
20'-21' CORE, 0.4' RECOVERY
20.0'-20.4' AS ABOVE

1700 CHECK WATER LEVELS
TIME DTW = ~~22.14' bgs~~ OPEN BOREHOLE
1701 22.14' bgs S-80 TD = 22.60' bgs

11/4/08 — 4

Time	Well	DTW
1704	S-40	25.22' btoc or 21.23' bgs
1709	SE-40	Dry To 22.12' bgs
1711	SW-~~40~~ 20	Dry To 20.73' bgs
1713	S-20	21.49' btoc or 20.53' bgs
1715	S20 E40	Dry To 31.64' bgs
1717	W40	Dry To 19.37' bgs
1718	W20	Dry To 19.18' bgs
1721	MW-02	23.33' btoc
1723	E-20	21.80' btoc or 20.54' bgs
1725	E-40	22.95' btoc or 20.82' bgs
1727	E-80	Dry To 26.46' bgs
1729	N-20	Dry To 25.98' bgs
1730	NE-20	Dry To 27.87' bgs
1735	OFFSITE.	

11/4/08

11/5/05 — 5

Time	Well	DTW	TD	
0840	ONSITE: M. McVey, J. Fisher, L. Trejo			
0850	TAILGATE SAFETY MEETING			
0855	CHECK WATER LEVELS			
0858	~~S-80 21.46' bgs~~	21.46' bgs	21.88' bgs	0.42'
	S-40	24.89 btoc		
		20.88' bgs	26.10' bgs	5.22'
	S-20	20.09' bgs	28.59' bgs	8.50'
	SE-40	Dry to 22.14' bgs		
	S20, E40	Dry to 31.64' bgs		
	E 80	Dry to 26.49' bgs		
	E40	20.85' bgs	28.11' bgs	7.26'
	E20	20.86' bgs	23.85' bgs	2.99'
	NE 20	Dry to 27.80' bgs		
	N 20	Dry to 25.93' bgs		
	W 20	Dry to 19.06' bgs		
	W 40	Dry to 19.39' bgs		
	SW 20	Dry to 20.55' bgs		
0935	START ON New Boring Approx 25' W of MW-02. Push Down To 20' Before Coring.			
0958	20-24' Core, 2.7' Recovery 20.0'-21.0' Sandy Clay, Sand is V. Fine To Fine Grained, Well Graded			

11/5/08 5

20.0'-21.0' CONT
~~Red~~ RED 2.5YR 2.5YR 5/6
~~21.0'~~ SOME WEATHERED SAMPLE. DRY TO DAMP
21.0'-~~21.9'~~ 22.5' AS ABOVE W/ GRAVELS
UP TO 1/2", & INCREASING
SAND GRAIN SIZE TO V. FINE
TO COARSE. DRY TO DAMP
~~21.9'~~ DOWN TO 21.9. MOIST FROM
21.7' TO 22.1'. DRY ~~FROM~~
& HARD FROM 22.1-22.7.
1008 START ON NEW BORING
APPROX 140' S OF MW-02
PUSH DOWN TO ~~APPROX~~ 16'.
1022 16'-20' ~~CORE~~, 1.6' RECOVERY
16.0'-17.6' ~~A~~ CLAYEY SAND, ~~V. FINE~~ W/
SCATTERED CALICHE GRAVELS
UP TO 1/4", SAND IS V. FINE
~~TO F~~ GRAINED, RED 2.5YR 5/6,
WELL GRADED, DRY TO DAMP
EXCEPT DAMP TO MOIST
FROM 16.7'-17.0'. WEATHERED
SAMPLE FROM 16.0'-16.1'.
1045 REFUSAL AT 23'
20'-24' CORE, 2.0' RECOVERY
20.0'-20.7' AS ABOVE W/ INCREASING

11/5/08 F

20.0-20.7 CONT
CLAY CONTENT W/ DEPTH,
20.7'-20.9' GRAVELLY SAND, GRAVEL IS
UP TO 1/2", CALICHE GRAVELS,
SAND IS V. FINE GRAINED, WELL
GRADED, BROWN 7.5YR 5/4,
DRY
20.9'-22.0' SANDY CLAY, SAND IS V. FINE
GRAINED, V. HARD, PLASTIC
WHEN WET, RED 2.5YR 5/6,
W/ CALICHE MOTTLING & SMALL
CALICHE NODULES, DRY TO
SL. DAMP.
1055 RETURN TO W-40 TO INCREASE
DEPTH.
1130 19.5'-23.6' CORE, 2.8' RECOVERY
19.5-20.5 SILTY SAND, SAND IS V. F. NE
TO FINE GRAINED, WELL GRADED,
YELLOWISH RED 5YR 5/6, WET.
20.5'-21.2' CLAYEY SAND, SAND IS
V. FINE GRAINED, WELL GRADED,
YELLOWISH RED 5YR 5/6, ~~B~~ SOFT,
PLASTIC, WET
21.2'-22.3' SAME AS 19.5-20.5

11/5/08 J

W-40 Cont

1140 23.5'-28.0' Core, 1.9' Recovery
23.5'-25.4' Sandy Clay, Sand is V. Fine Grained, V. Hard, Plastic when Wet, Red 2.5YR 5/6, w/ Black & Caliche Mottling, Dry to Sl. Damp
TD = 28'
Start on W-90

1150 20'-24' Core, 2.5' Recovery
20.0'-22.5' Clayey Sand w/ Gravel & Caliche Nodules up To 1", Gravels are Limestone & Caliche Gravels, Sand is V. Fine To Coarse, Well Graded, Dry To Sl Damp Except for 21.3'-21.6' Which was Damp To Sl. Moist.

1205 24'-27.7' Core, No Recovery
2 Refusal At 27.7'

1225 Pull Temporary Well From S-40
TD = 22.78' bgs
W-40 ~~DTW= TD=~~
Sloughed In Approx 8'

11/5/08 J

E-40 TD = 28.02' bgs
~~DTW=~~

1255 W-40 Installed 10' of Pre-Packed Sand Filter Screen (2-5' Sticks) & 20' (4-5' Sticks) of 3/4" PVC Riser. TD = 27.18' bgs

1318 ~~S-40 DTW = 21.16' bgs~~
S-40 ~~Pulled~~ DTW 21.16' bgs TD = 22.43' bgs
Pushed Down To 26' & Installed Well ~~Filter~~ w/ Rods in Place; 25' of 1" Slotted PVC & 5' 1" PVC Stick-up Removed Rods & Filled w/ Sand To 1' bgs. Will Grout To Surface & Finish Surface Completion. TD = 26.35' bgs

1335 E-40 Was Installed w/ 25' (5-5' Sticks) of 1" Slotted PVC & 5' (1 Stick) of 1" PVC Stick-up Sand To 2' bgs. TD = 28.02'
DTW = 20.93' bgs

1340 Installed Temporary Well in WS S6S W25. ~~22~~ 23.25' bgs
DTW = Dry But Top of Point Moist

1358 Gauge S-140, Dry To 22.48' bgs

1403 Gauge W-90, DTW = 18.9'-19.2' TD = 21.78' bgs
Difficult To Gauge, Very Muddy From Sloughing In.

11/5/08

	W-40	TD = 27.14' btoc
		DTW = 17.87' btoc
1511	E-40	DTW = 20.80' btoc
		TD = 27.99' btoc
1516	E-80	DRY TO 26.29' bgs = TD
1519	E 520 E 40	DRY. TO 21.02' bgs = TD
1521	SE 40	DRY TO 21.71 bgs = TD
1524	S65W25	DTW = 22.91' bgs TD = 23.31' bgs
1526	S-80	DRY TD = 20.34'
1528	S-140	DRY TD = 22.37' bgs
1531	S-40	DRY, Bottom 0.2' of Probe Wet
		TD = 26.29' btoc
1534	W-40	DTW = 17.68' btoc
1546	W-90	DTW = 16.62' bgs TD = 17.33' bgs
1551	MW-02	DTW = 23.35' btoc TD = 28.30' btoc
1630	OFFSITE	

Brian 11/5/08

12/2/08

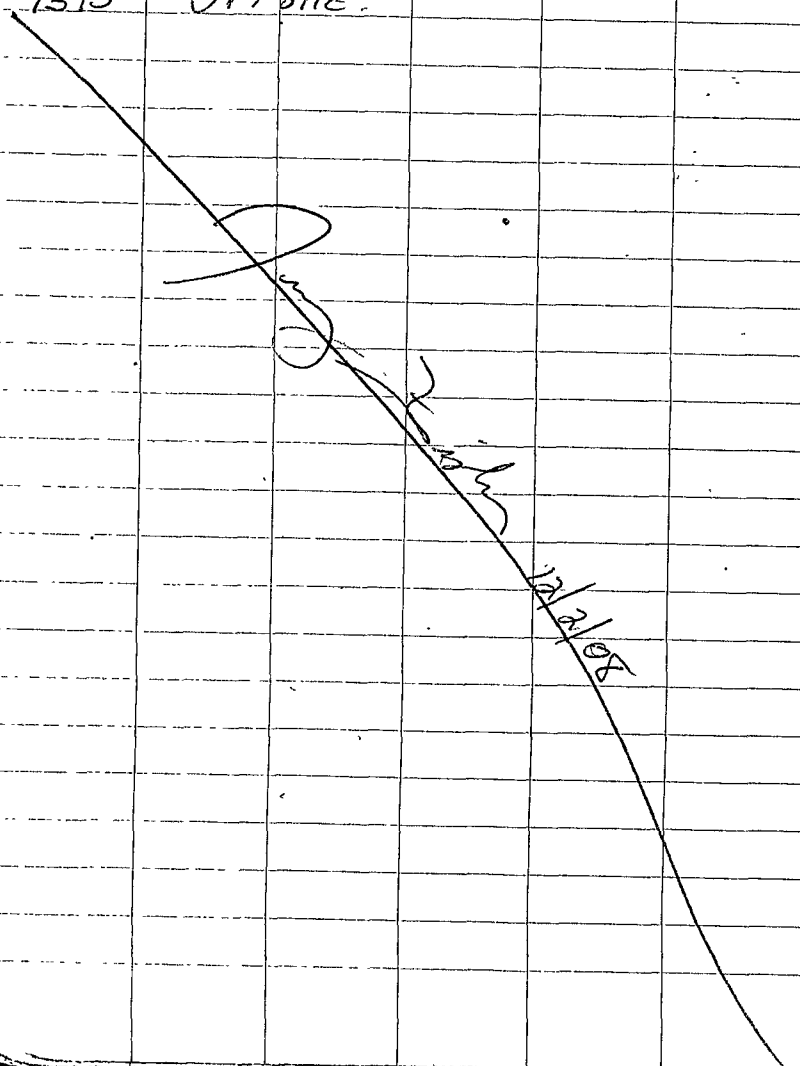
		DTW	TD	
1310	ONSITE			
1317	MW-02	23.70		
1319	W-40	18.29	27.11	
1322	S-40	20.74	26.22	
1324	E-40	20.69	27.93	
1327	E-80	DRY	24.59	TOP OF PROBE MAT DAMP SOIL BELOW TO
1330	E40S20	DRY	18.99	
1332	E40S40	DRY	30.79	NO FREE WATER INSIDE
1334	S140	19.95	20.05	MUD IN PROBE W/ WELL CUTTINGS BELOW
1337	" "	DRY	20.05	DAMP SOIL ON TOP
1338	S-80	DRY	19.73	
1340	W25S65	21.85 btoc	25.16	SCREEN IN PLACE TOC = 1.90' AGS
1345	S-20	~~19.~~ DRY	19.28	
1346	E-20	DRY	19.39	
1348	NE-20	20.88	21.47	TIP OF PROBE MUDDY W/ SOME FREE WATER
1350	N-20	DRY	19.19	
1352	W-80	DRY	16.71	
1420	FINISHED BAILING E-40 (WENT DRY)			
1433	"		" S-40	
	LEFT 3/4" PVC BAILER IN S-40.			
1457	FINISHED BAILING W-40. HAD TO USE 1/2" STAINLESS STEEL BAILER ON TOP OF 1/2" 3/4" POLY BAILER TO WEIGHT THE BAILER. 3/4" POLY BAILER REMAINS IN WELL.			

12/2/08

I

1500 ROTUIN TO E-40 TO CONTINUE BOILING. WENT DRY AGAIN AFTER A COUPLE OF BOILERS.

1515 OFFSITE.



Appendix C

Log of Well MW-2

HOLLY ENERGY PARTNERS

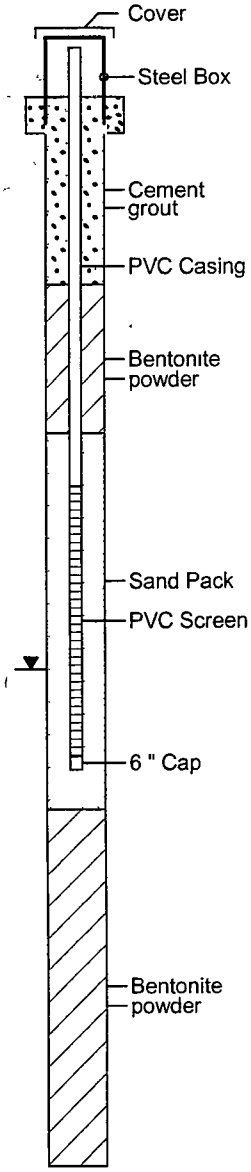
LOG OF WELL MW-2

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started	05/27/05, 1130	Drilled By	Eco/Enviro Drilling
Date, Time Completed	05/27/05, 1700	Logged By	D G Boyer, SESI
Hole Diameter	8 1/4"	Northing Coordinate	
Drilling Method	Hollow Stem Auger	Easting Coordinate	
Drilling Equipment	Foremost-Mobile B-57	Survey By	

Sample Type:
SS Split Spoon (18 in or 24 in)
CB Core Barrel (5 ft)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Type	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
0	CT				0-5 ft. SAND, reddish brown, fine grained, uniform, dry
5	CT		SP		5-10 ft. SAND, brown to reddish brown, very fine to fine grained, slightly damp, caliche fragments to 1/2 in. at base
10	CT				10-12 ft SAND, brown to reddish brown, very fine to fine grained
12	CT		SP/GP		12-14 ft. GRAVELLY SAND, sand brown, fine grained, with granitic gravels to 1.5 in. Large gravels angular, smaller gravels rounded, quartz common in gravels
14			SP		
15	CT		SC		14-15 ft. SAND, as above
					15-20 ft CLAYEY SAND, grading to sandy clay at 20 ft. Possible contact with redbeds.
20	CB	2	CL		20-25 ft. GRAVELLY SILTY CLAY/ GRAVELLY SANDY CLAY, reddish brown, with very hard caliche in tip, gravels are caliche gravels
25	CB	5	CL		25-28.5 ft CLAY, reddish brown, very dry (redbed)
					28 5-29 ft. CLAY, green-gray-brown striations, very dry
30	CB	5	CL/CS		29-31 ft CLAY and CLAYSTONE, clay brown, claystone dark brown, partially consolidated, poorly cemented, very dry
			CL		
			MS		31-33.1 ft. CLAY, reddish brown, stiff, very dry, powdery when broken
35	CB	5	CL/CS		33.1-35 ft. CLAYSTONE, dark brown, poorly consolidated, poorly cemented, dry
			CS		35-35.9 ft CLAY and CLAYSTONE, reddish-brown, very dry
40					36.9-40 ft. CLAYSTONE, dark brown, poorly cemented, occasional green inclusions (pea size), occasional caliche streak, very dry.



Well Construction Information

COMPLETION DATA

Hole Depth	40 ft Below LS
TD Inside casing	28 29 ft Below TOC

CASING, SCREEN & CAP

Material, joints	PVC, threaded
Diameter	2 in ID
Manufacturer	LAIBE
Screen type	Slotted
Screen length	10 ft
Screen opening	0 020 slot
Scrn placement	15-25 ft BLS
Sump	None
Bottom Cap	0.5 ft PVC
Protector Casing	Above grade steel
Lock Key #	--

SEALS & SAND PACK

Cement seal type	QuikCrete
Cem't placement	0 - 7 ft BLS
Grout placement	--
Annular seal type	Aquagel bentonite
Seal volume	3 bg powder, hydrated
Seal placement	7-12 5 ft. BLS
Sand pack type	8/16 Oglebay silica
Sand volume	9 bags
Sand placement	12.5-25 ft. BLS
Lower Annular seal	5 bg powder, hydrated
Seal placement	26 5-40 BLS

ELEVATIONS

Ground elevation	Approx 4035 ft
Inner casing, top	--

WELL INSTALLATION
Drilled to 40 feet with 8 1/4" auger to determine lithology Backfilled to 25 ft and installed well with 10 ft screen 5 bags bentonite powder to 26 5 ft., 1.5 bags 8/16 Oglebay-Norton sand to 25 ft , 7 5 bags to 12 5 ft, 3 bags Aquagel bentonite powder to 7 ft , hydrated QuikCrete cement mix to surface Installed locking steel protection casing, stick-up approximatel 3 2 ft above land surface. Water at 24 86 BTC

WELL DEVELOPMENT
On 05/29/05 measured DTW at 24 49 ft BTC Pumped out approximately 2 5 gallons and collected water sample

On 06/03/05 measured water at 24.56 ft and pumped 1 5 gallon until dry

Notes
Location south side of service road opposite SE corner of landfarm Cell 6

Z:\SESCentral\Company Files\Artesia Aeration\Boring-well Logs\MW-2 Well BOR

RECEIVED
2008 AUG 4 PM 1 29

ARTESIA AERATION

APPLICATION FOR SURFACE WASTE PERMIT

Application

For State Use Only

1301 W Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-137
Revised March 1, 2007

Submit 1 Copy to Santa Fe Office

APPLICATION FOR SURFACE WASTE MANAGEMENT FACILITY

A meeting should be scheduled with the Division's Santa Fe office Environmental Bureau prior to pursuing an application for a surface waste management facility in order to determine if the proposed location is capable of satisfying the siting requirements of Subsections A and B of 19.15.36.13 NMAC for consideration of an application submittal.

Application: x New ☐ Modification ☐ Renewal

Type: ☐ Evaporation ☐ Injection ☐ Treating Plant ☐ Landfill ☐ Landfarm ☐ Other

Facility Status: ☐ Commercial ☐ Centralized

4. Operator: Artesia Aeration

Address: P.O. Box 310 Hobbs, New Mexico 88241

Contact Person: Lary Parker Phone: 575-390-6402

Location: _____/4 _____/4 Section 5, 6, 7 Township 17S Range 32E

Is this an existing facility? ☐ Yes XX No If yes, provide permit number _____

7. Attach the names and addresses of the applicant and principal officers and owners of 25 percent or more of the applicant. pecify the office held by each officer and identify the individual(s) primary responsible for overseeing management of the icility.

Attach a plat and topographic map showing the surface waste management facility's location in relation to governmental irveys (quarter-quarter section, township and range); highways or roads giving access to the surface waste management acility site; watercourses; fresh water sources, including wells and springs; and inhabited buildings within one mile of the site's perimeter.

Attach the names and addresses of the surface owners of the real property on which the surface waste management facility is sited and surface owners of the real property within one mile of the site's perimeter.

). Attach a description of the surface waste management facility with a diagram indicating the location of fences and cattle guards, and detailed construction/installation diagrams of pits, liners, dikes, piping, sprayers, tanks, roads, fences, gates, berms, pipelines crossing the surface waste management facility, buildings and chemical storage areas.

1. Attach engineering designs, certified by a registered professional engineer, including technical data on the design elements of each applicable treatment, remediation and disposal method and detailed designs of surface impoundments.

2. Attach a plan for management of approved oil field wastes that complies with the applicable requirements contained in 19.15.36.13, 19.15.36.14, 19.15.36.15 and 19.15.36.17 NMAC.

3. Attach an inspection and maintenance plan that complies with the requirements contained in Subsection L of 19.15.36.13 NMAC.

4. Attach a hydrogen sulfide prevention and contingency plan that complies with those provisions of 19.15.3.118 NMAC that pply to surface waste management facilities.

15. Attach a closure and post closure plan, including a responsible third party contractor's cost estimate, sufficient to close the surface waste management facility in a manner that will protect fresh water, public health, safety and the environment (the closure and post closure plan shall comply with the requirements contained in Subsection D of 19.15.36.18 NMAC).

16 Attach a contingency plan that complies with the requirements of Subsection N of 19.15.36.13 NMAC and with NMSA 1978, Sections 12-12-1 through 12-12-30, as amended (the Emergency Management Act).

17. Attach a plan to control run-on water onto the site and run-off water from the site that complies with the requirements of Subsection M of 19.15.36.13 NMAC.

18. In the case of an application to permit a new or expanded landfill, attach a leachate management plan that describes the anticipated amount of leachate that will be generated and the leachate's handling, storage, treatment and disposal, including final post closure options.

19. In the case of an application to permit a new or expanded landfill, attach a gas safety management plan that complies with the requirements of Subsection O of 19.15.36.13 NMAC

20. Attach a best management practice plan to ensure protection of fresh water, public health, safety and the environment.

21. Attach a demonstration of compliance with the siting requirements of Subsections A and B of 19.15.36.13 NMAC.

22. Attach geological/hydrological data including:

(a) a map showing names and location of streams, springs or other watercourses, and water wells within one mile of the site;

(b) laboratory analyses, performed by an independent commercial laboratory, for major cations and anions; benzene, toluene, ethyl benzene and xylenes (BTEX); RCRA metals; and total dissolved solids (TDS) of ground water samples of the shallowest fresh water aquifer beneath the proposed site;

(c) depth to, formation name, type and thickness of the shallowest fresh water aquifer;

(d) soil types beneath the proposed surface waste management facility, including a lithologic description of soil and rock members from ground surface down to the top of the shallowest fresh water aquifer;

(e) geologic cross-sections;

(f) potentiometric maps for the shallowest fresh water aquifer; and

(g) porosity, permeability, conductivity, compaction ratios and swelling characteristics for the sediments on which the contaminated soils will be placed.

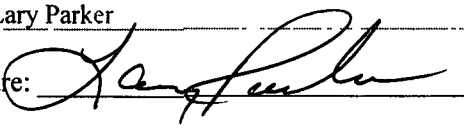
23. In the case of an existing surface waste management facility applying for a minor modification, describe the proposed change and identify information that has changed from the last C-137 filing.

24. The division may require additional information to demonstrate that the surface waste management facility's operation will not adversely impact fresh water, public health, safety or the environment and that the surface waste management facility will comply with division rules and orders

25. CERTIFICATION

I hereby certify that the information submitted with this application is true, accurate and complete to the best of my knowledge and belief.

Name: Lary Parker

Signature: 

Title: Operational Manager

Date: 08/04/08

E-mail Address: _laryp1128@yahoo.com

Surface Owners

Application for Solid Waste Landfill Submitted by Artesia Aeration

The following is a listing of the owners of Artesia Aeration located 1.2 miles west of Maljamar, New Mexico. They also are equal owners of the real property on which Artesia Aeration is located.

Jim Wilson
8115 N. Grimes
Hobbs, New Mexico 88240
505-392-4742

Rob Matthews
P.O. Box 181
Madisonville Texas
936-348-1255

Jack Matthews
26 E. Compress Road
Artesia New Mexico
575-748-2854

Glen Hedgecock
Carlsbad New Mexico 88220
575-234-9098

Operating Manager
Lary Parker
1718 W. Millen
Hobbs, New Mexico 88242
505-390-6402

Landowners of record within one (1) mile radius of Artesia Aeration are:

Olane and Ladoyce Caswell
Caswell Ranch
Maljamar, New Mexico 88264
806-637-7004

U.S, Department of Interior
Bureau of Land Management
Carlsbad Field Office
Attention: Bobbie Young
P.O. Box 1778
Carlsbad, New Mexico 88220-6292

State of New Mexico
State Highway and Transportation Department
District II Headquarters
4505 West Second Street
P.O. Box 1457
Roswell, New Mexico 88201-1457

Norman Caswell

4 39.97 | 3 39.97 | 2 39.95 | 1 39.93 | 4 39.93 | 3 39.97 | 2 39.99 | 1 40.03 | 4 40.04

5 40.08

U.S.A.

6

5

Olane Caswell

S 88°54'48" E 3181.75'

765.75'

656.52'

376.97'

379.81'

Olane Caswell

Norman Caswell

203293

7-8-05

Artesia

Aeration LLC

N35°55'33" E 38.43.31'

1939.95'

R= 5829.60'

S47°10'19" W

1679.48'

N87°43'22" W 2312.70'

7

8

3 40.93

4 40.91

Olane Caswell

U.S.A.

Norman Caswell

Norman Caswell

2.80 ac

2 40.93

18

1

17

3 40.95

4 40.97

U.S.A.

U.S.A.

U.S.A.

Norman Caswell

Norman Caswell

1 40.98

2 40.98

Site Description

DESCRIPTION OF ARTESIA AERATION

Artesia Aeration is proposing to install a surface waste landfill disposal facility at a location that is one point two (1.4) miles west of Maljamar, New Mexico. It is adjacent to Artesia Aeration Landfarm which will be phased out upon awarding the waste permit for the landfill. Private landownership surrounding Artesia Aeration for one mile is the Caswell Ranch. Mr. Caswell is well aware of our endeavors to open a landfill and strongly supports our efforts.

Artesia Aeration is located on sections 5, 6, 7, of township 17S and range 32E in Lea County New Mexico. It consists of 167.856 acres of pasture land with no waterways, lakes, or streams located within guidelines set forth in 19.15.36.13 NMAC. The site is ideally located to help relieve the burden put upon the two existing landfill facilities currently permitted in Lea County and give greater options to operators in the surrounding operating area. In addition, the site meets and exceeds all siting requirements set forth in 19.15.36.13 NMAC.

The location and coordinates of the facility is 032deg 51' 14.23" N 103deg 48' 26.25"W. A map of the site located at back of application. Also attached is supporting maps, research, and plans to make the application acceptable to the commission.

We are located in an area that is easily accessible for producers and with the cell configuration and design will not be obtrusive to passing traffic or to the municipality of Maljamar, New Mexico. The site is ideally suited for our proposal and will help accomplish the desired results of the New Mexico Oil Conservation Division environmental containment program.

References

Ash, S.R. 1963. Ground-water conditions in northern Lea County, New Mexico: U.S. Geological Survey, Hydraulic Investigations Atlas.

Water well records on file with the Office of the New Mexico State Engineer and the U.S. Geological Survey.

Lea County Courthouse Public Record Department

Pit Drawings

PIT DESIGN

Artesia Aeration proposes the following pit design to comply with division specifications.

We plan to excavate our pit to twenty-two (22) feet in depth with one hundred and twenty-(120) foot by one hundred and fifty (150) dimensions. We will incorporate a three to one slopes on the north, east, and west sides and a one to six slope on the south side. The south side will allow access to bottom of pit for installation of leak detection and leachate systems at base of cell and any stabilization of liner needed prior to acceptance of waste materials.

The base of cell will consist of two-(2) foot of clay material that will be compacted to ninety (90) percent standard proctor density. All materials will be graded so as to have no stones or debris that could cause compromise to the geomembranes we will be utilizing. The liner we propose to use for lower geomembrane is a 30 mil PVC. We will use a compacted sand base of six (6) inches on which we will install our leak detection system. This leak detection system will consist of a four-(4) inch schedule 80 PVC .010 slotted screen. Eighteen (18) inches of compacted sand will be laid on top of leak system to allow for migration of any fluid leakage. There will be four-(4) inch PVC risers located at each end of slotted screens. These will extend above grade for leak detection and for removing any fluid that may leachate into system as well as for future sampling.

A 30 mil PVC liner will be installed on top of leak system and be the primary lining system. Akome is the contractor we have selected to install our liner. They have multiple years' experience in pit linings and they have the practical knowledge to install the liner as per specifications. The liner will be laid and seamed together with a twenty-(20) foot liner lip around all sides of disposal cell. All seams will be thermally sealed as per standards set forth by division. The attached illustrations show our proposed pit design and the leak and leachate system we anticipate installing.

Management & Maintenance

Management Plan for Artesia Aeration

PART 1) Depth to ground water at Artesia Aeration is in excess of 100 feet as displayed by monitor wells drilled at location in accordance with 19.15.36.13 NMAC. No ground water is located 50 foot below the lowest level of disposal area in compliance with 19.15.36.13 section a. 5. Artesia Aeration meets all criteria set forth in 19.15.36.13 section B and is in compliant in all areas.

PART 2) Artesia Aeration waste management will be less than the 500 acres set forth in the siting requirements.

PART 3) Artesia Aeration has no plans or seeks no permits to accept waste fluids at the proposed landfill facility. Our primary function will be to accept solid oilfield wastes for disposal at the landfill only.

PART 4) Artesia Aeration will accept only non-hazardous oilfield waste that is verified by certification of a signed form C-138 from the generator or authorized agent. All exempt waste will be from approved process from oil and gas operations and explorations. These waste streams will not be co-mingled with non-exempt wastes. We will accept certifications on a per load basis with the exceptions of continual approved waste stream processes or projects. This certification will be on a monthly basis. This documentation will be inspected by an attendant at the time of entrance into facility. All documentation and certifications will be kept at facility for division inspection.

PART 5) Artesia Aeration will not accept waste that contains naturally occurring radioactive material (NORM). A radiation survey will be conducted with the copy of the survey being kept on site. This will be monitored and administrated by the agent of Artesia Aeration that will be on duty. All documentation of monitoring and inspection will be on hand at facility. Material having readings of more than 30 picocuries above background will be denied disposal access.

PART 6) All solid waste accepted at Artesia Aeration must pass the paint filter test pursuant to EPA method 9095 A.

PART 7) Artesia Aeration will accept non-exempt solid wastes with an approved C-138 and all required testing documentation. The testing required will be as follows:
TPH (hydrocarbon analysis)
TCLIP (hazardous constituent analysis)
Ignitability Test
Corrosivity
Reactivity Test
Paint Filter Test
All material must be below limits set forth. Testing must be at approved and recognized test facility with copy of test results accompanying C-138 and kept at facility for division inspection.

PART 8) Artesia Aeration will accept non-hazardous, non-oilfield waste only is so directed by the department of public safety. We will complete C-138 describing waste and reason for acceptance and submit to OCD for inspection.

PART 9) Operational procedures for Artesia Aeration will be as follows:

A 6ft X 6ft sign will be on display at entrance to facility stating facility name, permit number, legal location, and emergency phone numbers. This sign will be visible for 100 foot.

An employee will be on duty during all operational hours stationed at entrance to facility. The gates will be locked when an attendant is not on duty and the facility is closed. Normal operating hours will be from 7:00am mst to 5:30pm mst Monday through Friday. Facility may remain open for extended time during projects and based on facility personnel. No entrance will be allowed when attendant is not on duty. Entire facility will be fenced and all gates will be locked.

All documentation and recordkeeping will be maintained at disposal facility. Copies of all incoming manifests, C-138's, and other documentation will be filed and available for division inspection. All manifests will include generators name, site or location from which waste was generated, date of disposal, description of material, and volume of material. The will also include the transporter, name of the driver, and the person accepting the material as well as the time of day. A sample of receiving manifest will be submitted for approval by the division upon permitting.

PART 10) Artesia Aeration will conduct monthly inspection of all leak detection monitoring stations on all disposal cells active and closed. This inspection will include volume of leak detected, a report of analytical data, a detail report of date, location of detection, and corrective measures proposed. This inspection will be made available to the division and be kept on file at facility. The report will include the status of the leak detection system and the name of the inspector. The inspection will be made within the first five days of each month.

An inspection will be made twice yearly of all monitoring wells associated with the facility. Water, if encountered, will be analyzed and all reports of sampling will be supplied to OCD division. Any maintenance records, status reports, and inspectors name will also be supplied in accordance with guidelines.

Inspection of berms around active cells will be a daily activity with quarterly inspections being furnished to the division. Repairs made because of erosion, wind, or storm conditions will be corrected and noted with these records being kept at facility for inspection.

Artesia Aeration will maintain berms with a minimum height of three (3) foot around disposal cells to protect commingling of fluid run off with solid waste in cell. This will also prevent overflow of cell with excessive rain and moisture and contain fluids for removal to authorized fluid disposal facility. A buildup of fluids will be removed via vacuum trucks as accumulations warrant. No fluids will be stored on facility. There are no waterway, rivers, lakes, ponds, or playas within five (5) miles surrounding proposed facility.

MAINTENANCE PROCEDURES

A daily inspection will be done on entire facility. The inspection will be done by the supervisor on duty prior to opening of the facility daily. The inspection will begin with housekeeping duties performed at the proposed office and surrounding area. All trash will be disposed of and cleanliness will be demanded.

A complete inspection of all roadways will be done prior to opening the facility for disposal. Obstacles will be cleared and trash and debris removed and placed in dumpster. Leakage from trucks and vehicles, if any, on roadways will be cleared and disposed of in cell. A visual inspection of road condition will be made at that time also. If repair is needed, it will be made prior to opening facility.

Inspections will be made on disposal cell including berms, surrounding backing areas, and the pit itself. Repairs to berms will be made immediately to ensure runoff control is intact. The area where trucks and vehicles back to pit will be kept smooth and well indicated to avoid backing or pullout accidents and mishaps. The pit area will be visually inspected for any apparent problems. The surface covering of the liner will be adequately covered by soil to ensure no tearing or ripping of the liner on the surface area. An inspection of the surrounding fence will be done and any problems noted and handled promptly the same day to ensure security and prevention of unapproved access or accidental entry to facility by personnel or animals. All deficiencies or problems will be noted by the inspector and filed in office for reference and or inspection by the OCD. All write ups will be handled immediately or as soon as equipment or personnel become available. Inspections will done on all facility equipment such as loaders, dozers, and excavators to ensure trouble free operations and prevent breakdowns. Downed equipment could cause serious backup problems at the disposal. Inspection and maintenance records of all equipment will be kept at office.

Cleanliness, safety, and environmental protection will be our uppermost priority and will not be taken lightly. All inspection records will be reviewed by operations manager daily and follow up inspections will be performed.

H2S Contingency

H2S Contingency Plan for Artesia Aeration

Artesia Aeration is appying for a solid waste permit and if approved we anticipate a very low exposure rate to hydrogen sulfide. The facility will be manned during all operating hours and admittance will be monitored and recorded. During closed hours gates will be closed and locked with admittance allowed only with company personnel present. Any load checked in at gate or office that has a H2s reading of more than 10ppm will be throughly checked and if reading register more than 50ppm entry will be denied and no alloance to dispose of at Artesia Aeration. To maintain a safety level for the pubic and for our emplyoees we will implement the following plans:

All emplyoees will receive training and certification for working in H2S environments. This training will be conducted by a certified training instuctor and company. Certification will be renewed annually and all employees will retain their certificates on their persons at all times.

All emplyoees working in the facility will wear personal H2S monitors while in the facility. Employees will be educated in the proper use and maintence of monitors. Monitors will be inspected and serviced by a certified person or company in accordance with manufactors requirements. In additon to personal monitors a multi-gas monitor will be on site to ensure safe working conditions. The multi-gas monitor will be located in the office area and be available to facility supervisor to monitor any readings over 10ppm. A Scott air pack will be located within facility office in the event of an emergency to be used to evacuate a fallen employee or visitor on site.

Windsocks will be installed strategically on site to inform employees, contractors, and customers on site of the prevailing wind directions in case of any excessive H2s releases. The socks will be placed as follows: One sock will be placed at the enterance to the facility and readily visable as one drives in to the facility. One will be placed southwest edge of the facility 50 feet from nearest disposal cell. One will be placed on northern edge of disposal cell area. These windsocks will be of adaquate size and color to be readily visable

from disposal area and will comply with regulations concerning previous. An audio warning devise will be installed to notify persons on site in the event of a discharge of over 100ppm H2S. Instructions will be posted in office proper manuvers in the event of an emergency.

The following emergancy phone numbers will be posted for notification in the event of a H2S release of over 100ppm.

Lovington Fire Department - Emergency 911- Non emergency- 505-396-2359
Maljamar Fire Department- Emergency 911- Non emergency- 505-676-4100
Loco Hills Fire Department- Emergency 911- Non emergency- 505-746-5000
New Mexico State Police Emergency 911- Non emergency- 505-392-5588(in accordance with N.M. HMER)
Lea County OCD Non emergency- 505-393-6161

An assemly area will be established directly outside of eastern gate for all employees to gather in the event of an H2S release. This area will be designated by a sign and on the emergency information sheet in office. The plant manager will be in charge of personnel acountability in the event of an evacuation. Drills will be conducted on a quarterly basis with documentation of drill and results will be kept on site for one year.

In the event of a release of over 100ppm H2S the following procedures will be followed:

The alarm will be sounded by supervisor or first available employee.
All personnel are to assemble in designated area.
Supervisor will ensure all personnel are accounted for and assembled.
Emergency phone numbers will be called by supervisor or available employee.
Gates will be closed and locked.
Entry will not be allowed except for trained responders.
Supervisor and employees will co-operate with responders and assist

as directed.
All clear will sound when emergency has been eradicated and responders have given all clear.
Gates will be reopened only at that time.
Detailed report will be given to OCD within 24 hours.

At all times Artesia Aeration will abide and adhere to the "Recommend Practices for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide" RP-55. It is our goal to make Artesia Aeration a safe atmosphere in which to work with the knowledge that we are doing our part to ensure safety.

Closure Plan

CLOSURE PLAN FOR ARTESIA AERATION

Artesia Aeration plans on having only one open, active disposal cell in operation at any given time. Consequentially, our closure plan would be of a smaller scale. Attached are quotes that would facilitate the closure.

We are only going to be a solid waste disposal site and no fluids will be stored or disposed of at our facility. As stated we plan on having only one active cell in operation at any time with filled cells completely closed pursuant to 19.15.36.14 paragraph 8 of Subsection C. This will incorporate 12 inches of compacted sand above top of oilfield waste material and then the installation of a 30-mil PVC liner as supplied and installed by Akome Inc. We will have 12 inches of sand on top of liner utilizing a 4% slope to aid in drainage. The final layer will be of native soil that will be re-seeded. Quotes from Sweatt Construction and Akome Inc. are attached showing the scope of their work with dirt work and liner installation.

We are also submitting a closure sampling process that will have an engineering firm sample all monitoring well quarterly for the first year after closure and semi-annually there after. This is more testing than is required as stated in 19.15.36.18 Subsection D paragraph 3. Attached is a cost estimate provided by Safety and Environmental Solutions Inc.

Upon closure of facility all fences will be checked for integrity and damaged. Repairs will be made if needed. Any temporary structures would be removed. Gates would be securely locked and postings of facility closure would be posted at entrance. This work would be done at the prevailing roustabout rate, currently $75.00, on a per hour basis.

Utilizing the cost estimates provided the approximate closure cost for the facility would be $97,234.37. This includes sampling of monitoring well for 30 years as stated in 19.15.36.18 Subsection D paragraph 3.

GCI/d/b/a SWEATT CONSTRUCTION INC.
720 SOUTH TEXACO ROAD
HOBBS, NEW MEXICO 88240
(505) 393-3180 - FAX (505) 391-9895

GENERAL DIRT WORK
OIL FIELD ROADS - PITS - LOCATIONS

DECEMBER 28, 2007

ARTESIA AERATION INC.

ATTN: JIM WILSON OR LARRY PARKER

RE: LANDFILL CLOSURE AND RECLAMATION
LEA COUNTY, N.M.

WE WISH TO SUBMIT OUR BID TO FURNISH LABOR AND MATERIALS TO COVER USING ONSITE MATERIAL AND RE-SEED APPROXIMATELY 50 ACRES. USEING WATER TRUCK TO FACILITATE SEED GROWTH AS DIRECTED.

TOTAL BID PRICE	$28,620.00
TAX	1,538.33
TOTAL BID PRICE INCLUDING TAX	$30,158.33

SINCERELY,

KENDALL LIVINGSTON
VICE PRESIDENT
GCI d/b/a SWEATT CONSTRUCTION, INC.

THANK YOU FOR THE OPPORTUNITY TO BID ON THE ABOVE PROJECT.

KL/sp

AKOME INC.

419 West Cain
P.O. Box 2038
Hobbs, New Mexico
88241

Phone: 575-393-2910

Artesia Aeration Cost Estimate

The following is a cost estimate to close the proposed disposal pits located one mile west of Maljamar, New Mexico. The liner material of 30 mil thickness to be installed on top of pit with dimensions of 120 foot by 150 foot with 10 foot overlap will be as follows:

Labor and material (30 mil liner material)	$9,877.00
Tax	$679.04
TOTAL	$10,556.04

Transportation and labor expense included in quote.

Thank you for this opportunity and we look forward to working with you on this and future projects.

Jack Duffy

Per your request, here is a cost estimate in current dollars for water sampling at Artesia Aeration assuming all three wells need to be sampled.

Labor $275
Mileage $125
Equipment Rental (meter, pumps) $115
Sampling/Laboratory analysis (BTEX, TDS, Chloride) $405
Expendibles (twine, gloves) $20
Expendibles first sampling (bailers, tubing) $107.50

Summing this up, the first year sampling (quarterly) will be $1,047.50 + ($942 x 3) = $3,873.50 + tax
Each subsequent year, semi-annual sampling $942 x 2 = $1,884 + tax

These are cost estimates only based on current charges for the items listed above. SESI work is performed on a time and materials basis.

If you need further information, please let me know.

Dave

David G. Boyer, P.G.
Hydrogeologist
Safety and Environmental Solutions, Inc.
P.O. Box 1613
703 E. Clinton, Suite #102
Hobbs, NM 88241
office: 575-397-0510
fax: 575-393-4388
cell. 575-390-7067
email: dgboyer@sesi-nm.com

Contingency Plan

CONTINGENCY PLAN FOR ARTESIA AERATION

Artesia Aeration will be a solid oilfield waste only disposal facility. At no time will the disposal or storage of liquid oilfield waste be allowed. The contingency plan will reflect this fact. Any amendments to this contingency plan including changes of emergency coordinators, changes in facility design, and equipment changes will posted five (5) days prior to change. The division will be notified prior to changes for approval.

In the event of a fire the response action will be to immediately contain the fire in the area it occurs and the evacuation of personnel non-essential to the rehearsed response. The fire will be contained by the use of stored soils that surround the disposal pit. The fire department services will be called immediately on discovery or reporting of the fire. A listing of the fire response departments will be on display at the onsite disposal office as well as onsite personnel training for such emergencies. The emergency coordinator will make the additional reporting processes as necessary. The area immediately surrounding the disposal cells will have all ready been cleared of all vegetation which will help to isolate any fire hazard or spreading of fire. An alarm horn, with adequate volume, will be installed at disposal office which will be activated to alert personnel of emergency. An evacuation escape route and staging area will be posted prominently for employee and visitor information.

Fire extinguishers will be located at central location and at active disposal cell for extinguishing smaller fires. All fires will be reported promptly to the OCD division. Explosions will be responded to by the emergency coordinator by first evacuating all personnel to staging area located outside entrance to facility. He will immediately notify all appropriate fire departments, police agencies, and state and local response teams. Having no fluid stored or disposed of at the facility the danger of explosions and fires are lessoned greatly but our response training and vigilance to maintain a safe environment will not be lessoned.

Any emergency situation such as an explosion, fire, gas release, or release would constitute a temporary closing of the facility. The emergency coordinator would take the following steps:

1. Use notification system to alert personnel of emergency situation.
2. Alert all employees to shut down all equipment, electrical and mechanical and report to staging area east of facility.
3. Identify the character, exact source, amount, and extent of any released materials. This will be done by observation or review of facility records and, if necessary, by chemical analysis.
4. Concurrently assess possible hazards to human health and or the environment that may result from the release, fire, or explosion. This assessment will consider both direct and indirect effects.
5. Notify the appropriate state or local agencies if their help is needed. The agencies and contact numbers are listed below.
6. If the coordinator determines that the emergency could threaten health or the environment outside the facility he must report his findings as follows:
    a) If his assessment indicates that evacuation of local areas may be advisable, he must immediately notify appropriate authorities. He must be available to help the officials decide their course of action; and
    b) He must immediately notify the National Response Center (1-800-424-8802)
    c) The report will include the following:
    Name and phone number of the reporting party
    Name and address of the facility
    Time and type of incident(fire, explosion, etc.)
    Name and volume of materials involved
    The extent of injuries if any
    The possible hazards to human health, or the environment outside of the facility.

7. During the emergency, the coordinator must take all reasonable measures necessary to ensure that fires, explosions, or releases do not occur, or recur, or spread to other areas of facility. This could include stopping operations, collecting and containing releases, and removing or isolating materials.
8. Immediately after emergency, the Emergency Coordinator must provide for storing and disposing of recovered waste, contaminated

fluids, or any other material that results from a release, fire, or explosion at the facility.

9. The Coordinator must ensure that in the affected areas of the facility;
    a) No waste that may be incompatible with the released material is treated, stored, or disposed of until cleanup procedures are completed;and
    b) All emergency equipment listed in the contingency plan is cleaned and ready for use before operations are resumed.
10. The Emergency Coordinator must notify the Regional Administrator of the EPA, Region VI in Dallas Texas (214-606-6444) and the appropriate state (NM-EID 505-827-2926) and local (Lea County LEPC 505-397-3636) authorities that the facility is in compliance before operations may be resumed in the affected areas of the facility.
11. The Emergency Coordinator must document time, date, and details of any incident that requires implementing the contingency plan. Within 15 days after an incident the company must submit a written report on the incident to the EPA Regional Administrator, Region VI 1201 Elm Street, Dallas, Texas 75270 and the New Mexico Environmental Improvement Division, Hazardous Waste Bureau, 1190 St. Francis Drive, P.O. Box 968, Santa Fe, New Mexico 87504-0968. This report will include:
    a) Name, address, and telephone number of owner or operator.
    b) Name, address, and telephone number of the facility.
    c) Date, time, and type of incident (fire, explosion, release)
    d) Name and quantity of materials involved.
    e) The extent of any injuries.
    f) An assessment of actual or potential hazards to human health or the environment.
    g) Estimated quantity and disposition of recovered material that resulted from the incident.

Any release of contaminates because of excessive rains or flooding would be first contained be berm extensions and heightening efforts. The emergency coordinator would notify division within twenty-four hours following such an occurrence where the material breached the surrounding berms. The coordinator will also contact any appropriate state or local agencies within

the same time frame as needed. Containment of contamination would be ongoing with procedures to protect the health of personnel and the impact on the environment being the priority of the coordinator. Clean up of contamination would be started immediately upon determination of extent and approval of all agencies involved. Progress of cleanup would be reported daily with expected completion time frame included.

An explosion would constitute a closure of facility. After evacuation and notification a thorough investigation would determine cause and effect. Procedures would be instituted to alleviate any further dangers and prevent future incidents prior to re-opening facility.

Artesia Aeration will only be accepting solid non hazardous wastes such as contaminated soils, drilling operations waste, oilfield debris, and associated materials. We will be accepting no hazardous materials as demonstrated by C-138 that will accompany all materials disposed of at facility. Artesia Aeration will not be accepting any fluids for storage, disposal, or re-cycling.

Artesia Aeration will be using a chimney method to manage any gas accumulations that may arise. We will incorporate the use of slotted PVC chimney pipes through out our disposal cells. These pipes will be three (3) inch in diameter. They will be slotted and buried tem (10) foot below grade with three (3) foot above surface. These will help relieve any buildup of gas generated in the land fill. These chimneys will be monitored monthly using a multi-gas monitor. These readings will be logged and kept on site for evaluation and inspection by division. These monitoring systems will be left in place upon closure of disposal cell and will also be in place during a final closure plan.

The following is a listing of emergency phone numbers that will be posted in a prominent place within the onsite disposal office:

Lovington Fire Department	911	non emergency - 505-396-2359
Maljamar Fire Department	911	non emergency - 505-676-4100
Loco Hills Fire Department	911	non emergency - 505-746-5000
New Mexico State Police	911	non emergency - 505-392-5588
Lea County Sheriff	911	non emergency -505-393-2515
Lea County OCD office		non emergency - 505-393-6161
New Mexico DOT		non emergency- 505-887-0460

Lary Parker will be the **Emergency Coordinator** for Artesia Aeration
Address 1718 West Millen Drive, Hobbs New Mexico 88242
Home Phone Number 505-631-9252 Emergency Phone 505-631-6402

A second person will be designated secondary emergency coordinator when our permit is issued. Contact information will be forwarded to division office as well as response agencies at that time. Any changes or additions to these designees will be forwarded to the appropriate agencies.

Upon receipt of permit all pertinent information will be supplied to each of the emergency responders listed.

The following is a list of all emergency equipment to be on hand upon opening of disposal facility:
3- Fire extinguishers 2 eight pound and one twenty-five pound class ABC
5- H2S monitors
2- 73 piece first aid kits
2- 10 minute H2S escape packs
1- Alarm system located on office with volume to be heard for ½ mile. (Alarm will be activated upon explosion, H2S high level, or fire.)
2- Wind socks to monitor wind direction. One located at entrance and one at active disposal cell

TRAINING PROGRAM

Artesia Aeration will conduct an annual training seminar for all key personnel. All operational systems will be discussed with training in areas that are related to each individual responsibility being addressed. Any changes that transpired will be discussed. Emergency operations and responsibilities will be reiterated with an evaluation of the previous year's progress. Sampling procedures will be discussed and results of previous year will be evaluated. Review of all paperwork and evaluation of the C-138's will be discussed. All minutes of these meetings will be recorded and kept on file for five (5) years.

All employees will receive training in RCRA general requirements with discussions on emergency response actions appropriate to the specific wastes handled at the facility.

All employees will receive training on proper use of fire extinguishing equipment as well as decontamination of spill control equipment.
All employees will participate in drills and evacuation procedures and their prospective assignments in the event of and emergency.

In addition to these training sessions we will also have monthly safety meetings that will be mandatory for all personnel. Safety issues will be addressed as well as safety training in such areas as H2S safety, first aid, fire fighting, heat stress, personal safety equipment, etc. During these meeting we will also discuss various aspects of our daily processes such as paperwork, waste sampling, and disposal cell maintenance. Records of these meeting will also be kept on record for inspection for five (5) years.

MW#2 & Siting

MONITOR WELL #2 ANALYSIS

An observation was made that monitor well #2 had water of an unknown source at a height of 26". While there is water in the monitor well it is believed that the water is not a viable potable water source. The geology of the area seems certain to be the cause of the water level and is not of any consequence.

Monitor well #2 is located 315' from our proposed disposal area which is well over the guidelines put forth in 19.15.36.13 NMAC. Monitor well #2 has a total depth of 40'. To alleviate any concerns about the standing water we decided to conduct several tests to help determine the source and amount of water we encountered.

First we decided to dig trench pits at various intervals around the well to determine from which direction the water was migrating from and determine the scope of any pool or flow. Attached is map M1 which shows the location of all trenches. Chart C1 shows the GPS location of all trenches and chart C2 shows observations of trenches.

All trenches were dug to minimum of 40' in depth with an average length of 50'. These trenches were dug using a step down method for safety operations and were dug without incident. We left the trenches open as we continue to monitor the conditions of each.

We also decided to to take daily measurements of the water height in MW2 at the approximate same time each day. Additionally we decided to bail the well dry daily at the same time. Chart D1 shows the daily log and results that were kept as well as the temperature and weather conditions.

Included is chart M2 which is an aerial photo of Artesia Aeration which helps illustrate the surrounding geology and helps us make our conclusions of the source of the water encountered in MW2.

Monitor well 1, well 3, and well 4, all continue to have no detection of any water. Monitor well #3 was drilled in the anticipated disposal area to a depth of 160' with no detection of water, of which all conclusions of this proposed site should be decided upon.

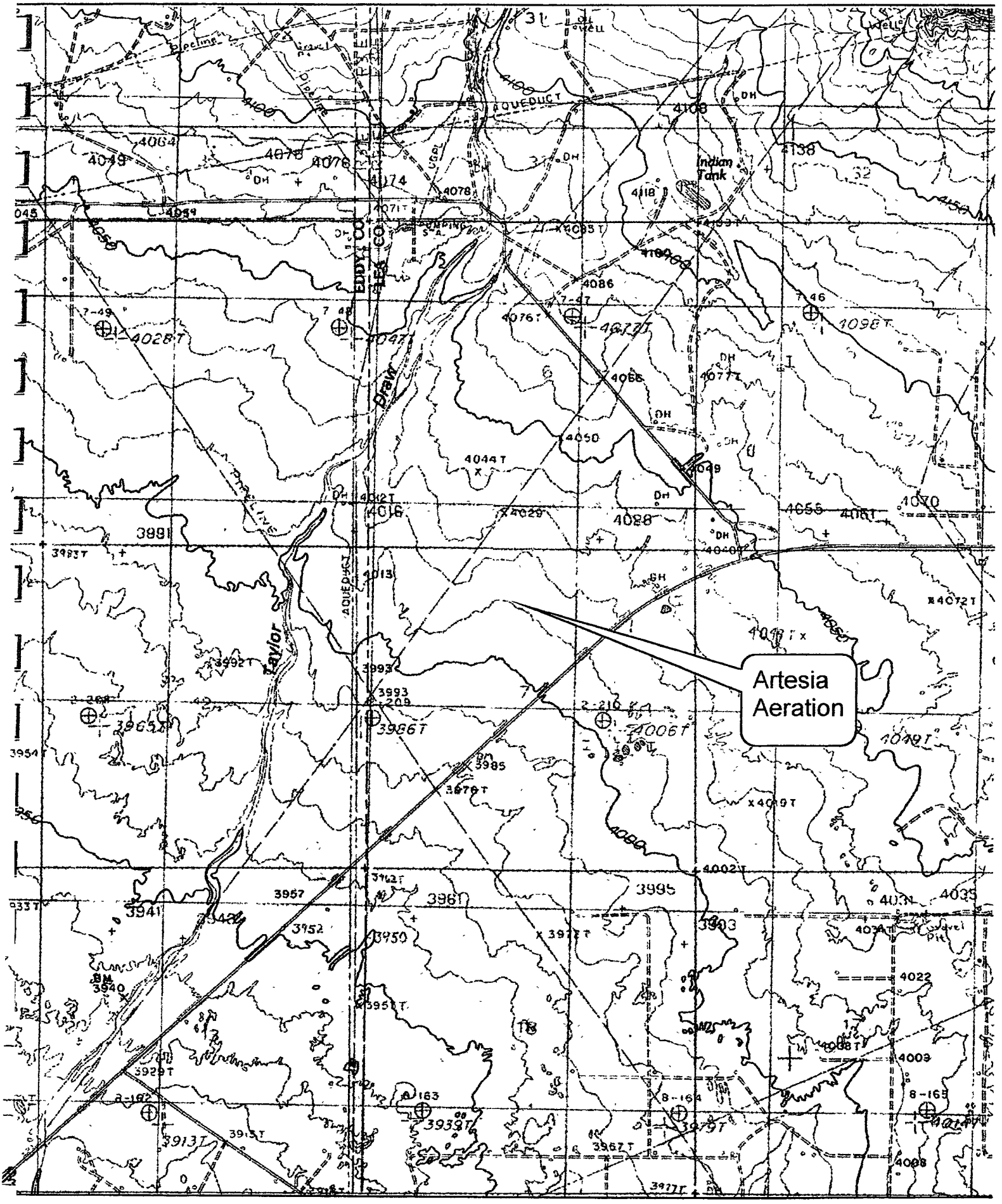
CONCLUSION OF MOITOR WELL #2

We contend that water found in monitor well #2 is a non-viable non-potable water source. The water indicated in the monitor well is well outside the guidelines set forth by 13.15.36.13 NMAC of 200 foot. The level of the well remains somewhat constant and only fluctuates with the environmental changes such as rain or snow. There is a natural funnel effect that comes into play upon examination of the aerial photo showing the natural geology and contours of the area to the northeast of the well. We theorize that the water encountered in monitor well 2 is the result of waters that follow the natural contours of the landscape and happens to funnel into an area that accumulates around the well.

There were three exploratory trenches dug on the eastern side of our proposed disposal site. These trenches were dug to a depth of 40' plus to prove the water source in monitor well 2 is in no way under our site. Monitor well #3 gives ample proof and evidence that there is no water in any form or way under our proposed disposal site.

In our research results and our opinion the water identified in monitor well #2 is the result of accumulations of storm waters that will migrate to the lowest place from the higher elevations of the areas to the northeast from the caprock area. The aerial photo following this conclusion helps illustrates the funneling effect.

Therefore Artesia Aeration contends that our proposed disposal facility will in no way pose any threat to the environment, water sources, or ecology of the surrounding area. As noted in the Groundwater Investigation Report supplied by Safety and Environmental Solutions, Inc., pages 3 and 4 their conclusion is parallel to ours and indicates "the lack of groundwater at the facility except at MW-2 demonstrates the suitability for its current and proposed use, especially with the engineering controls (synthetically-lined impoundments) that will be part of the facility design".



Name: MALJAMAR
Date: 1/29/2008
Scale: 1 inch equals 2000 feet

Location: 032° 51' 14.23" N 103° 48' 26.25" W NAD 83
Caption: Figure 1. Location Map, Artesia Aeration, Lea County, New Mexico

Maps & Charts

CHART C-1

TRENCH 1	32deg N 51' 07.9"	103deg W 48' 14.5"
TRENCH 2	32deg N 51' 07.5"	103deg W 48' 13.6"
TRENCH 3	32deg N 51' 07.5"	103deg W 48' 13.6"
TRENCH 4	32deg N 51' 08.8"	103deg W 48' 11.5"
TRENCH 5	32deg N 51' 10.1"	103deg W 48' 09.5"
TRENCH 6	32deg N 51' 07.1"	103deg W 48' 12.4"
TRENCH 7	32deg N 51' 07.8"	103deg W 48' 15.3"
TRENCH 8	32deg N 51' 08.7"	103deg W 48' 14.8"
TRENCH 9	32deg N 51' 05.3"	103deg W 48' 16.3"
TRENCH 10	32deg N 51' 05.9"	103deg W 48' 17.2"
TRENCH 11	32deg N 51' 09.5"	103deg W 48' 19.3"
TRENCH 12	32deg N 51' 13.4"	103deg W 48' 17.5"

MONITOR WELL #2 IS LOCATED AT 32DEG N 51' 13.4" 103DEG W 48' 13.9" FOR REFERENCE

CHART C-2

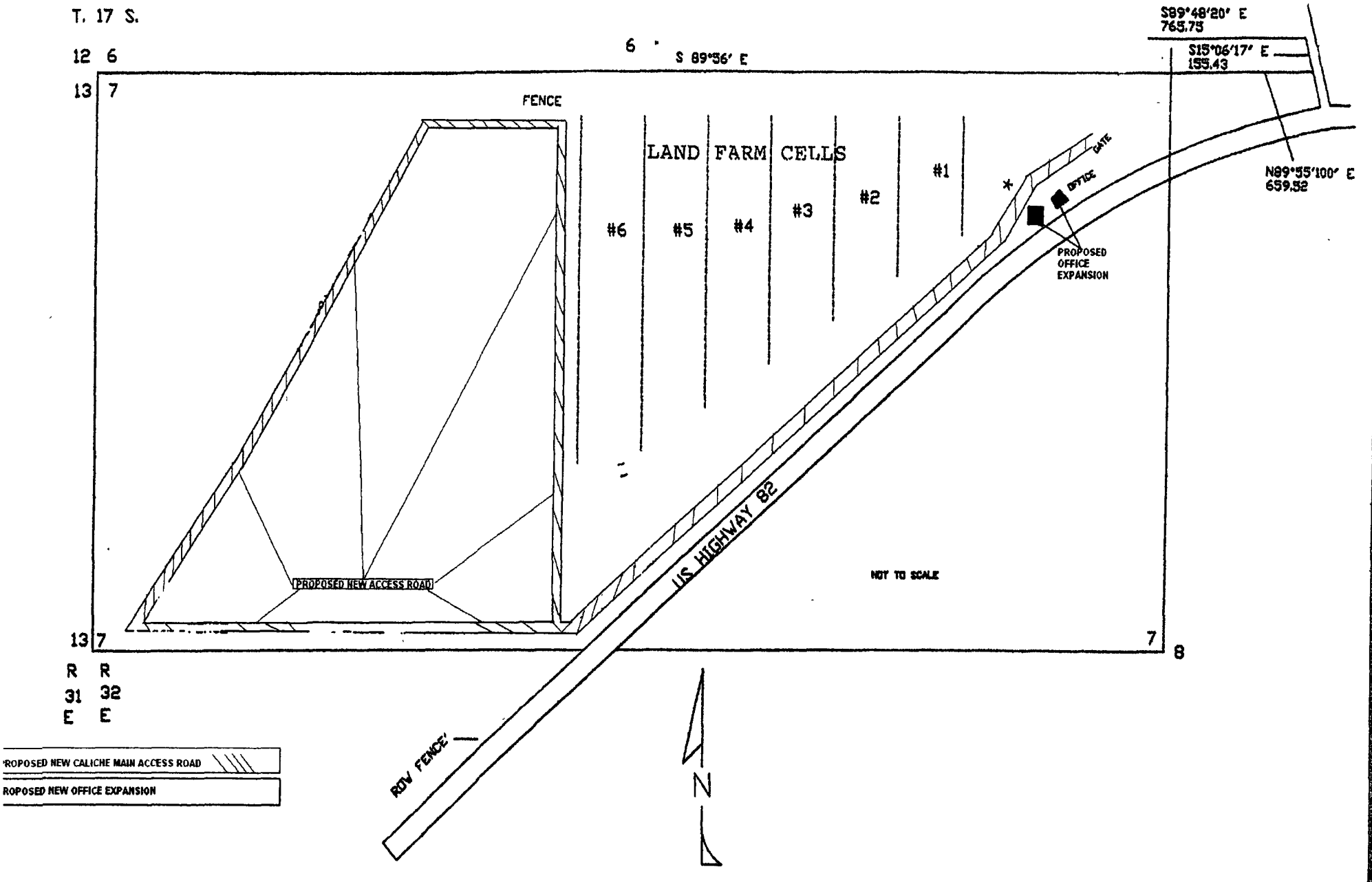
We began digging the observation trenches on February 2, 2008. Wayne Price and Brad Jones with the OCD came to evaluate the results and progress of the pits on February 20, 2008 and wrote summary of their visit dated February 21, 2008

When trench numbers 1, 2, 3, 4, and 7 were dug we encounter moist soil at 37 foot. We continued digging until approximately 40 foot. Overnight water drained into trenches to the height of about 1.5 foot. Trench 8 had no show of moisture or water until second day after digging. Water level rose to about 18" and has not varied to date.

Trenches 5, 9, 10, 11, and 12 had no show of moisture and had no water drain into trench and remain dry today.

The trenches were observed daily during the time the monitor well was bailed out. The water level dropped on all well having standing water. On 3/06/08 the level in trench 7 had dropped to no standing water. The levels on the other 5 trenches had declined to about 1 foot of standing water. On March 24 only pit #8 had any significant standing water with a level of less than one foot. Trenches 1, 2, 3, 4, and 7 had dampness at bottom of trench, but no standing water.

Our conclusions are explained and summarized under the conclusion tab.

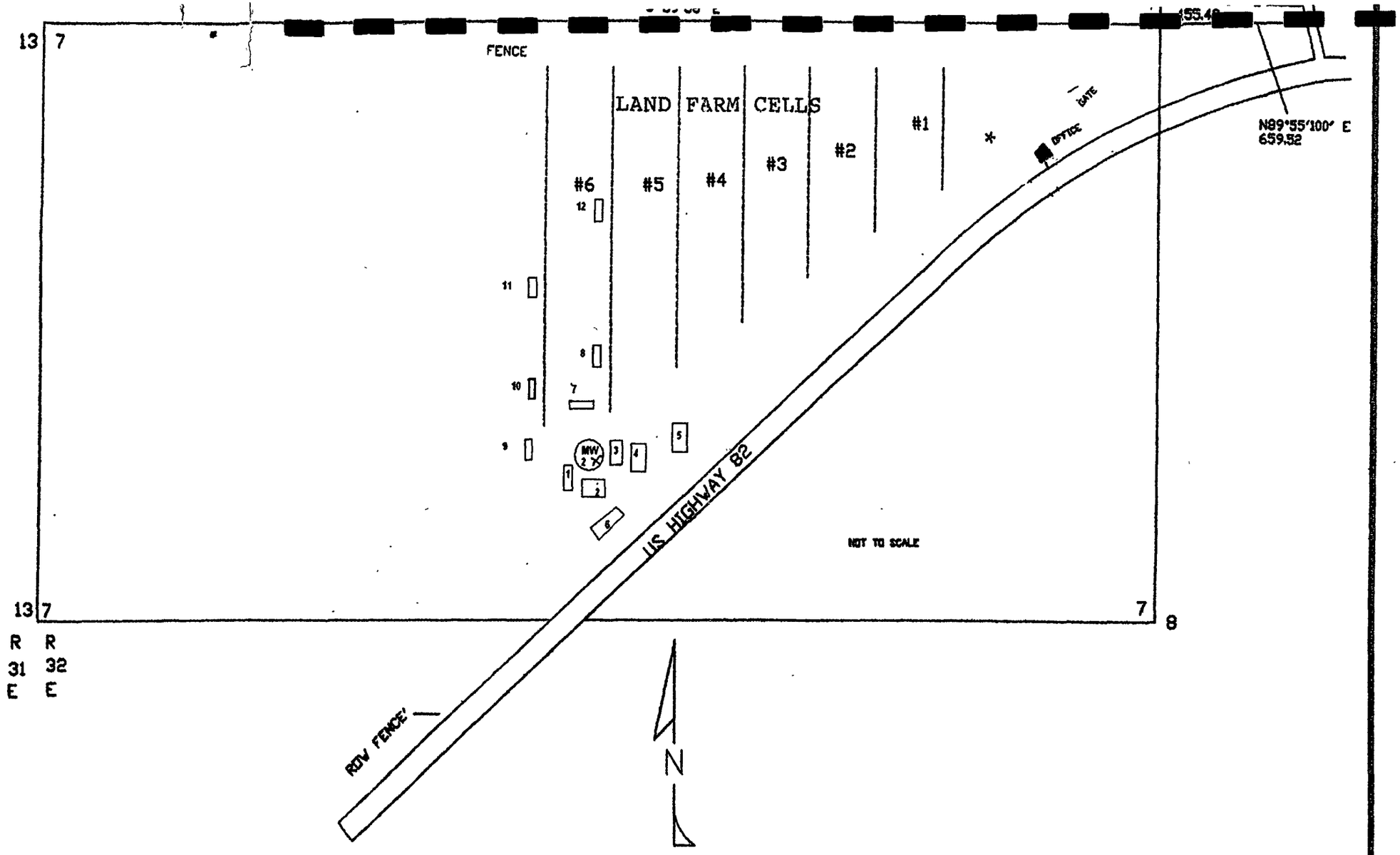


ARTESIA AERATION LLC

GPS #
32°-51'-17.1"N
103°-47'-56.9"W
ELEVATION: 4039

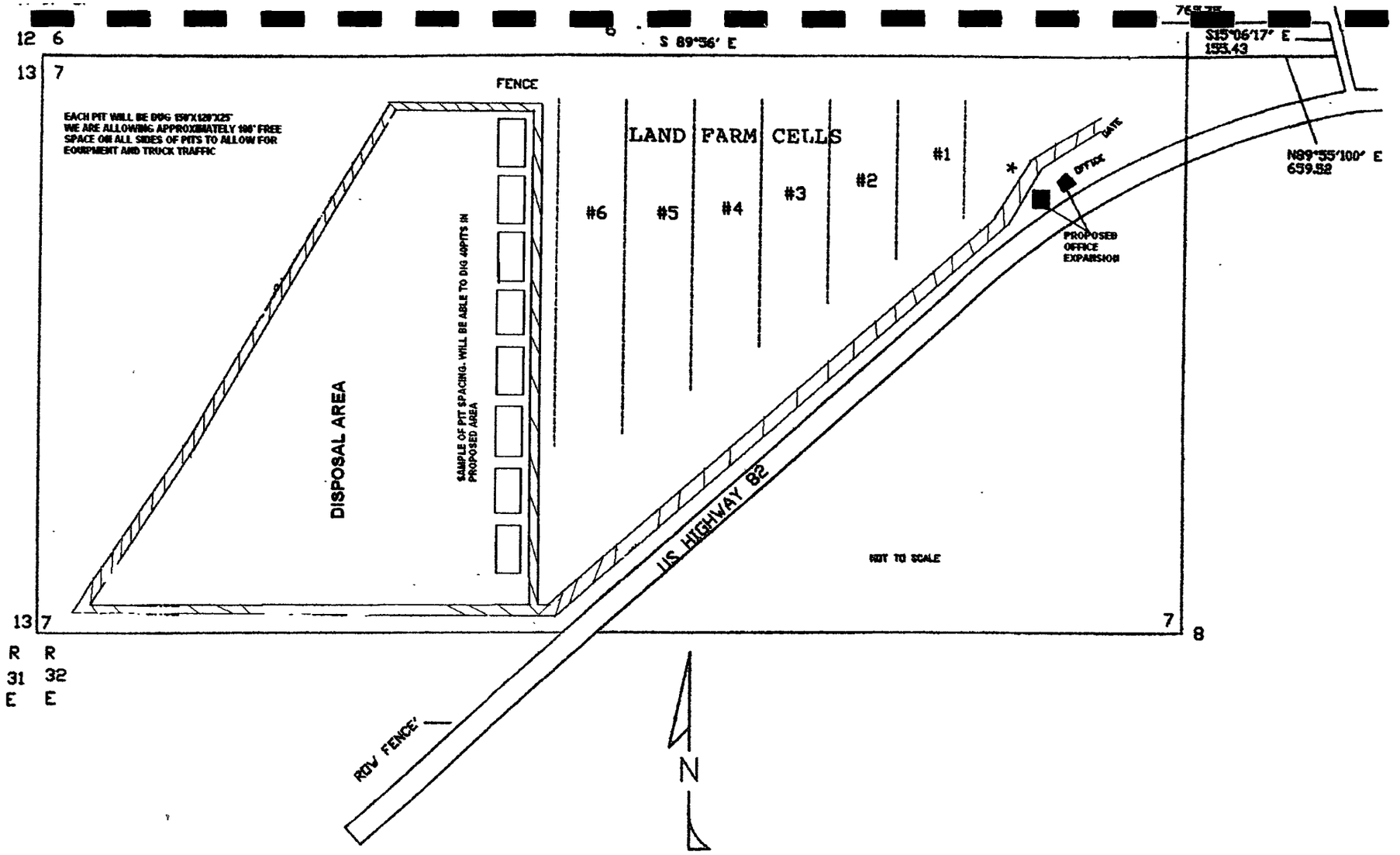
ARTESIA AERATION LLC

SECTIONS 5, 6 AND 7
TOWNSHIP 17 SOUTH, RANGE 32 EAST
N.M.P.M., LEA COUNTY, NEW MEXICO



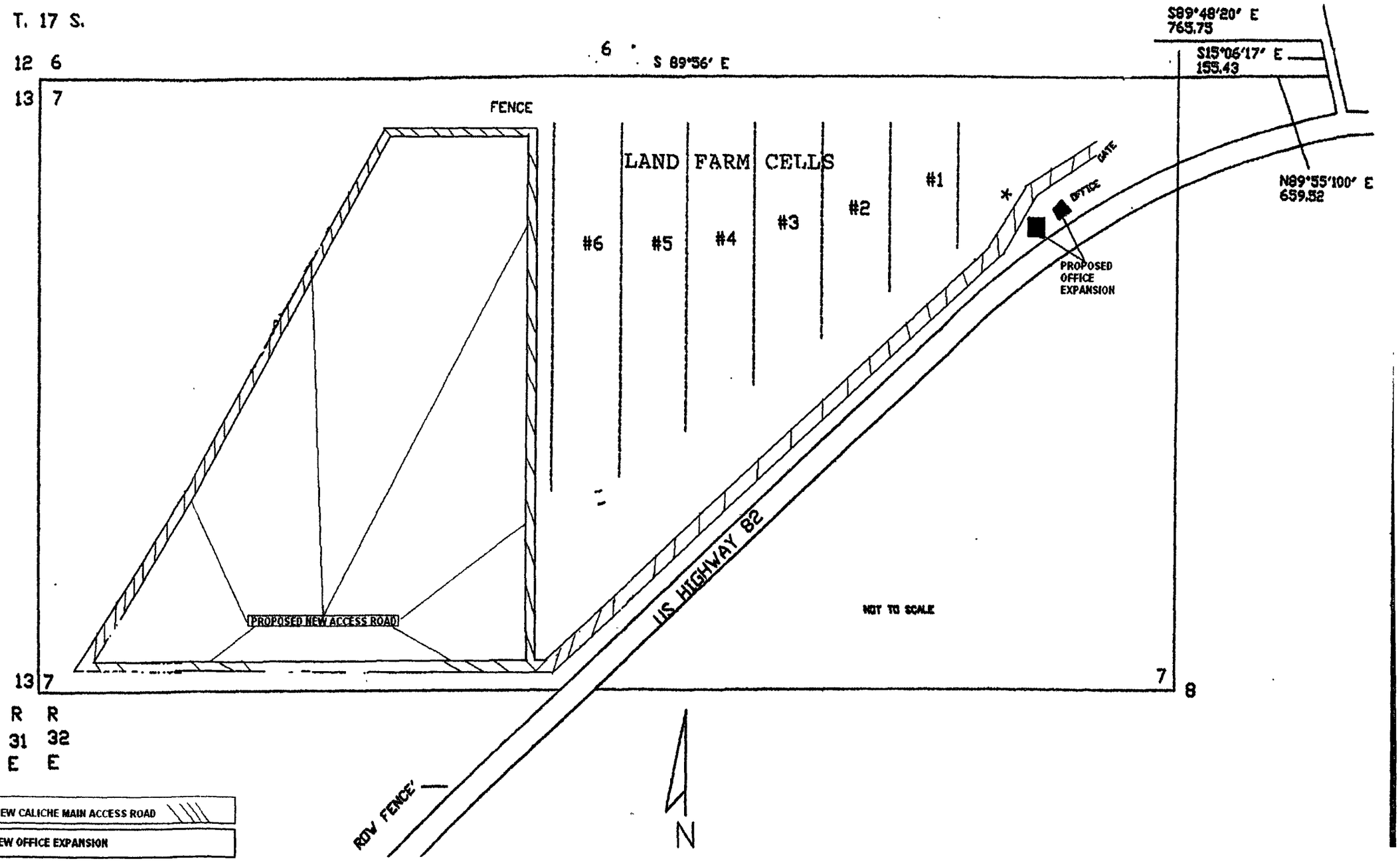
ARTESIA AERATION LLC

GPS # 32°-51'-17.1"N 103°-47'-56.9"W ELEVATION: 4039	ARTESIA AERATION LLC	SECTIONS 5, 6 AND 7 TOWNSHIP 17 SOUTH, RANGE 32 EAST N.M.P.M., LEA COUNTY, NEW MEXICO RICKS DIVERSIFIED



ARTESIA AERATION LLC

GPS # 32°-51'-17.1"N 103°-47'-56.9"W ELEVATION: 4039	ARTESIA AERATION LLC	SECTIONS 5, 6 AND 7 TOWNSHIP 17 SOUTH, RANGE 32 EAST N.M.P.M., LEA COUNTY, NEW MEXICO


T. 17 S.
12 6
13 7
6
S 89°56' E
S89°48'20" E
765.75
S15°06'17" E
155.43
N89°55'100" E
659.52
FENCE
LAND FARM CELLS
#1
#2
#3
#4
#5
#6
GATE
OFFICE
PROPOSED OFFICE EXPANSION
PROPOSED NEW ACCESS ROAD
US HIGHWAY 82
NOT TO SCALE
ROW FENCE
N
13 7
7
8
R R
31 32
E E
PROPOSED NEW CALICHE MAIN ACCESS ROAD
PROPOSED NEW OFFICE EXPANSION

DRAFT

RECEIVED
2008 AUG 4 PM 1 28

Groundwater Investigation Report
Artesia Aeration
Section 7, Township 17S, Range 32E
Lea County, New Mexico

January 2008

Prepared for:

Artesia Aeration
5614 Lovington Highway
Hobbs, NM 88240

By:

Safety & Environmental Solutions, Inc.
703 E. Clinton Suite 102
Hobbs, New Mexico 88240
(505) 397-0510

I. Introduction

The report presents the results of geologic and groundwater investigation at the Artesia Aeration facility, which is located in Section 7, Township 17S, Range 32E, Lea County, New Mexico. The facility location is located on private land approximately two miles west of the unincorporated community of Maljamar and is adjacent to and on the north side of US Highway 82. The location of the facility is shown in Figure 1.

II. Background

Artesia Aeration is an NM Oil Conservation Division (OCD) facility approved for the land farm remediation of hydrocarbon-contaminated soil resulting from current and past spills, leaks or other releases of petroleum hydrocarbon associated with the drilling and production of oil and natural gas. The facility desires to receive for long-term encapsulation salt-contaminated solids and soil resulting from drilling operations and produced water spills and leaks from said operations. The facility is preparing an application for submittal to the OCD for approval to receive such materials. The salt contaminated solids will be placed in lined pits with a maximum depth, including liners, of 25 ft. beneath the land surface. The maximum area within the facility where such proposed pits may be located is shown on Figure 2, the topographic survey, as "Proposed Expansion Area".

As part of the application, Artesia Aeration is providing the OCD with information on the geologic environment and groundwater, or lack thereof, in the vicinity of the proposed pits. Safety and Environmental Solutions, Inc., was engaged to supervise drilling and installation of a monitor wells and including a deep boring whose dual purpose is to provide lithologic information and serve as a monitoring well.

III. Geologic Setting

Lea County is divided approximately in half by an escarpment known as the Mescalero Ridge. This feature is oriented from northwest to southeast. To the east of the escarpment, the landscape is flat or only slightly undulating and is known as the High Plains. The escarpment itself consists of a cliff face capped by a thick layer of caliche known as the Caprock and may be as high as 150 feet. The caprock is the top of the Ogallala formation which is a sedimentary formation of Tertiary geologic age consisting mainly of sand, poorly to well cemented with calcium carbonate (i.e. sandstone), and some silts and clays. Its major feature is the layer of caliche which caps the formation most everywhere.

To the west of the escarpment, the landscape is dominated by irregular topography consisting of sandy alluvium and caliche deposits. This material is of rather recent geologic origin (Quaternary). The Artesia Aeration facility is just over two miles to the southwest of the escarpment and sediments in the immediate area of the facility are likely from erosion of the Ogallala material.

Beneath the Quaternary sediments at a depth of 30 to 50 feet in the area of Artesia Aeration are Triassic age sediments of the Dockum group known informally as the "redbeds." These rocks consist of claystone, mudstone, siltstone and fine-grained sandstones. Coloring may range from light brown to brown to gray depending on the predominant lithology; however, the most frequent is the reddish-brown color of the claystone and mudstone hence the name "redbeds." The borehole at the facility that was drilled to a depth of 160 feet and completed as a monitor well (MW-3) penetrated

approximately 110 feet of redbeds, and the colors and lithologies described above were observed in the core samples.

IV. Groundwater

Except for some locations in southern Lea County, potable groundwater is provided by wells located in the Ogallala formation. However groundwater is generally absent in the area to the west of the Ogallala caprock at Maljamar. The lack of potable groundwater west of the caprock has been documented in several reports by the NM Bureau of Mines and the US Geological Survey (see Section VI, References).

A search of New Mexico State Engineer Office and US Geological Survey records did not locate any water wells within two miles of the facility. The closest well found was located 2.3 miles north in Taylor Draw, an alluvial channel draining south from the escarpment. The depth to water was reported as 45 ft. in 1996. In the vicinity of Maljamar several wells were listed in the 1961 Southern Lea County groundwater report. However, with one exception they are shown as being on the Caprock. The one well in the alluvium was located near the Maljamar post office and had a depth to water of 83 ft. in 1954. The location of this well and the Taylor Draw well are shown on Figure 3. East of Maljamar, on the caprock, water wells are numerous; however these wells are located a distance of four miles or greater from the facility and are not mapped.

V. Site Investigation

In May 1999 a single monitoring well located near the entrance to the property (see Figure 2, the topographic survey, showing the location of that well, MW-D1) was drilled to a depth of 120 ft. and completed open hole with no casing or screen below about 20 ft. The lithology reported in the log to the NM State Engineer Office showed sand to 25 ft., green clay to 40 ft. and red clay, green clay and caliche to total depth. No water was encountered. Recent measurements indicate the hole has caved or bridged at a depth of 76 ft. below the top of casing.

Beginning in 2005 a series of boreholes was drilled on the property some of which were completed as monitor wells (the lithologic/completion logs for these wells are shown in the Appendix). Monitor well MW-1, also located near the entrance, encountered brown clay at 23 ft. and various clay and claystone to a depth of 35 ft. No groundwater was found. The borehole was backfilled to 25 ft. and completed as a monitor well which remains dry.

MW-2 is located at the south end of, and between, cells 5 and 6. The well is adjacent to the Highway 82 bar ditch and shows a thin saturated zone on top of red bed clays that may be due to infiltration from intermittent ponded water in the nearby highway bar ditch. A fresh water line is also present between the well and the highway ROW fence. Water levels and water quality for this well are shown in Tables 1 and 2.

Borehole BH-3 was located south of MW-2 between the well and the water line. It was thought that if a water line leak was responsible for the water seen in MW-2, a boring between the line and MW-2 might detect it. However the boring was dry to total depth of 30 ft. Redbeds were located at a depth of 26 ft. at this location.

At the request of the OCD, a third monitor well was drilled in the northwest area of the facility. Lithology to a depth of 50 ft. was determined using a 5 ft. core barrel inside a hollow stem auger. However, the drilling rig was not able to penetrate more than five feet into the consolidated sedimentary formation which begins about 45 ft. below the land

surface. The logs for the first 50 ft. at the MW-3 location are shown as MW-3-1 and MW-3-3. The lithology above 45 ft. was predominately sand with caliche near the surface. From 45-50 ft. the lithology changed to the type commonly associated with the "redbed," that is fine grained clay, claystones, mudstones and sandstones.

From 50 ft. to a total depth of 160 ft., the lithology was determined using an air rotary drilling rig that equipped with a 5 ft. diamond-tipped coring bit. Because the top lithology was generally loose sand, a 9-7/8 in. pilot hole was drilled to 50 ft and lined with a temporary 6-in. PVC surface casing. Below that, diamond bit cored samples whose length before core refusal varied between 2 and 5 ft. with the average length approximately 4 ft.

The lithology for this portion of the borehole (MW-3-2) was generally redbeds from 45 to 52 ft., a light brown fine-grained, well cemented sandstone between 52 and 108 ft., sandstone mixed with clay, mudstone and claystone to 126 ft., and clay and claystone "redbeds" to 160 ft. A composite of all the logs is shown on MW-3 Composite in the Appendix. The discovery of 56 ft. of light brown cemented sandstone in the borehole was not expected and could indicate that the material is from the Triassic Chinle formation, a component of the Dockum group.

After consultation with the on-site OCD representative, Mr. Brad Jones, the boring was backfilled from 160 ft. to 140 ft with bentonite capped with 1 ft. of sand for a well base. It was completed as a monitor well with a screened interval from 129 to 139 ft. The well has sand opposite the screen to 127 ft., bentonite chips (un-hydrated) to 117.5 ft. and cement grout to the surface. It is completed with an above-grade locking steel protection casing and a concrete pad. Measurements taken on December 13, 15 and 18, 2007 and on January 15, 2008 show no water or moisture in the monitor well.

VI. Conclusions

The following can be concluded as a result of the investigation:

1. A review of State Engineer, US Geological Survey and available groundwater reports show no groundwater wells within two miles of the facility. Groundwater is found further to the east associated with the Ogallala formation.
2. At the facility, shallow unconsolidated alluvial sediments exist from the surface to a depth of 25 to 45 ft. beneath the site. These are mainly sands with caliche present nearer the surface.
3. Beneath these sediments a series of consolidated and semi-consolidated fine-grained sedimentary deposits exist consisting of claystones, mudstones, sandstone and clay. The existence of over 50 ft. of well cemented sandstone was unexpected and could indicate the sediments are part of the Chinle formation, a component of the Dockum group.
4. The investigation determined that no alluvial or deeper groundwater exists at MW-3 to a depth of 160 ft.
5. Previously MW-1 did not detect groundwater when drilled to a depth of 35 ft. and continues to be dry at its completion depth of 25 ft.
6. Boreholes 3 and 4, which were not completed as monitor wells, did not detect groundwater at a depth of 30 ft.
7. Monitor well MW-2 contains groundwater with a current saturated thickness of 2.5 ft. However, the well was completed 5 ft. into the thick gravelly silty-clay zone

at the base of the sand zone. The source of this water is unknown, but maybe related to ponded water in the nearby bar ditch on the north side of the highway. The water level appears to fluctuate depending the amount of precipitation, especially heavier precipitation related to summer thunderstorms. The highest water level (saturated thickness 7.1 ft.) was measured in August of 2005 which the season of the summer monsoon.

8. The lack of groundwater at the facility, except at MW-2 as noted above, demonstrates the suitability for its current and proposed use, especially with the engineering controls (synthetically-lined impoundments) that will be part of facility design.

VII. References

Ash, S.R., 1963. Ground-water conditions in northern Lea County, New Mexico: U.S. Geological Survey, Hydrologic Investigations Atlas, HA-62, 2 plates.

Nicholson, A. Jr., and Clebsch, A. Jr., 1961. Geology and ground-water conditions in southern Lea County, New Mexico: N. Mexico Institute of Mining and Technology, State Bureau of Mines and Mineral Resources Ground Water Report #6, 123 p.

Water well records on file with the Office of the New Mexico State Engineer and the US Geological Survey.

VII. Tables and Figures

Table 1. Water Level Measurements, Artesia Aeration, Lea County, New Mexico

Monitor Well Name, Total Depth Below TOC (feet)	Elevation Top of Casing (feet)	Ground Level Elevation (feet), Note	Date Measured	Depth to Water Below TOC (feet)	Water Level Elev. (feet)	Water Saturated Thickness (feet)	Water Level Change (ft)
MW-1	4,036.21	4,032.91	05/21/05	Dry	--	--	--
27 81			06/01/05	Dry	--	--	--
			06/03/05	Dry	--	--	--
			06/08/05	Dry	--	--	--
			06/29/05	Dry	--	--	--
			07/12/05	Dry	--	--	--
			07/14/05	Dry	--	--	--
			07/22/05	Dry	--	--	--
			07/26/05	Dry	--	--	--
			08/02/05	Dry	--	--	--
			08/05/05	Dry	--	--	--
			08/09/05	Dry	--	--	--
			12/15/05	Dry	--	--	--
			08/13/07	Dry	--	--	--
			10/26/07	Dry	--	--	--
			01/15/08	Dry	--	--	--
MW-2	4,015.60	4,012.42	05/29/05	24.49	3,991.11	3.6	--
28.06		*	06/01/05	24.59	3,991.01	3.5	-0.10
		*	06/03/05	24.56	3,991.04	3.5	0.03
		*	06/08/05	24.66	3,990.94	3.4	-0.10
		*, 10:30 am	06/29/05	24.97	3,990.63	3.1	-0.31
		*, 3:45 pm	06/29/05	25.24	3,990.36	2.8	-0.27
		*	07/12/05	25.22	3,990.38	2.8	0.02
		*	07/14/05	25.24	3,990.36	2.8	-0.02
		*	07/22/05	25.39	3,990.21	2.7	-0.15
		*	07/26/05	25.43	3,990.17	2.6	-0.04
		*	08/02/05	21.60	3,994.00	6.5	3.83
		*	08/05/05	21.07	3,994.53	7.0	0.53
		*	08/09/05	21.01	3,994.59	7.1	0.06
			12/15/05	23.33	3,992.27	4.7	-2.32
		*	08/13/07	24.35	3,991.25	3.7	-1.02
			10/26/07	25.11	3,990.49	3.0	-0.76
		*	01/15/08	25.58	3,990.02	2.5	-0.47
MW-3	--	4,028.37	12/15/08	Dry	--	--	--
142.15			12/18/07	Dry	--	--	--
142.9			01/15/08	Dry	--	--	--
MW-D1	4,037.08	4,032.40	05/13/99	Dry	--	--	--
124.68			05/21/05	Dry	--	--	--
			08/13/07	Dry - unable to determine total depth			--
76.03			10/26/07	Dry	--	--	--
			01/15/08	Dry	--	--	--
Locations surveyed 08/08/07							
* - Pumped dry after measurement							

Table 2. Water Quality Results, Artesia Aeration, Lea County, New Mexico

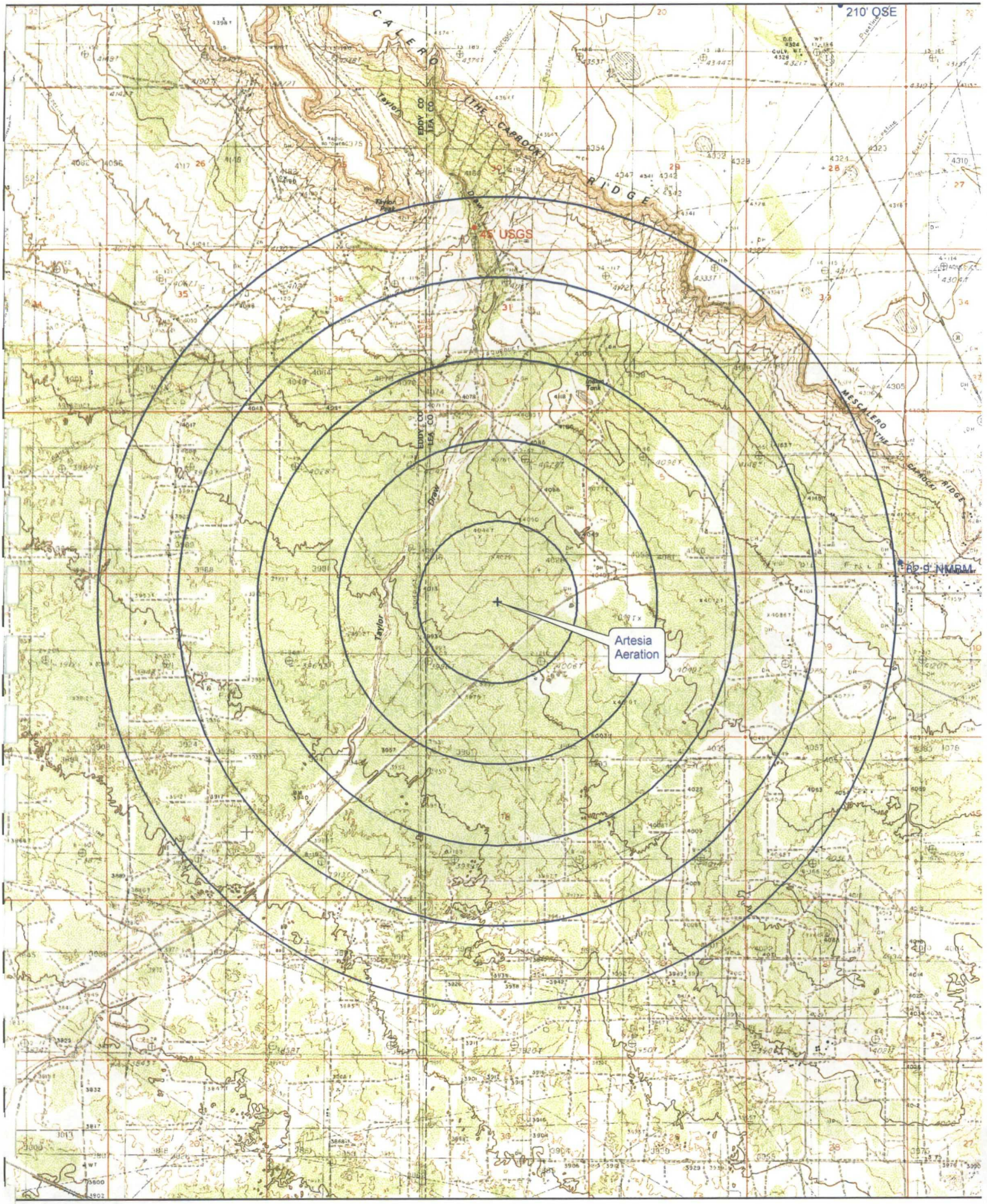
Monitoring Well	Sample Date	Chloride (mg/L)	Total Dissolved Solids (mg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (total, µg/L)
MW-2	05/29/05	364	1,263	- -	- -	- -	- -
	08/13/07	1,500	4,600	0.5	0.5	0.5	<1.0
	01/15/08	980	3,700	0.5	0.5	0.5	<1.0
NM Groundwater Standard[1]:		**250**	**1,000**	**10.0**	**750**	**750**	**620**
Notes: 1.	Water Quality Control Commission Standards adopted by the NM Oil Conservation Division						
2005 analysis performed at Cardinal Laboratories, Hobbs, NM using EPA SW-846 method 160.1 (TDS),							
	and Standard Method 4500-Cl B (Cl)						
2008 Analyses by Argon Laboratories, Hobbs, NM using EPA SW-846 methods 8021B (GC volatile organics),							
	160.1 (TDS) and 300.0 (Cl).						

Figure 1. Location Map, Artesia Aeration, Lea County, New Mexico

Name: MALJAMAR
Date: 1/29/2008
Scale: 1 inch equals 2000 feet

Location: 032° 51' 14.23" N 103° 48' 26.25" W NAD 83
Caption: Figure 1. Location Map, Artesia Aeration, Lea County, New Mexico

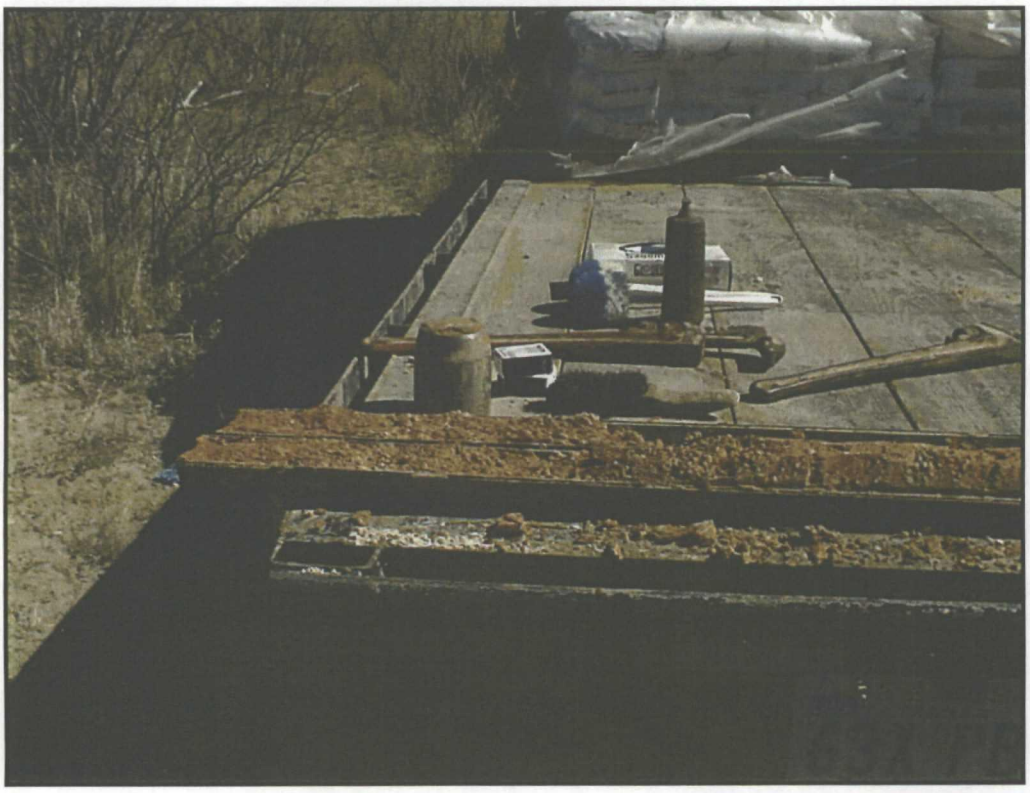
Figure 2. Topographic Survey, Artesia Aeration
Lea County, New Mexico



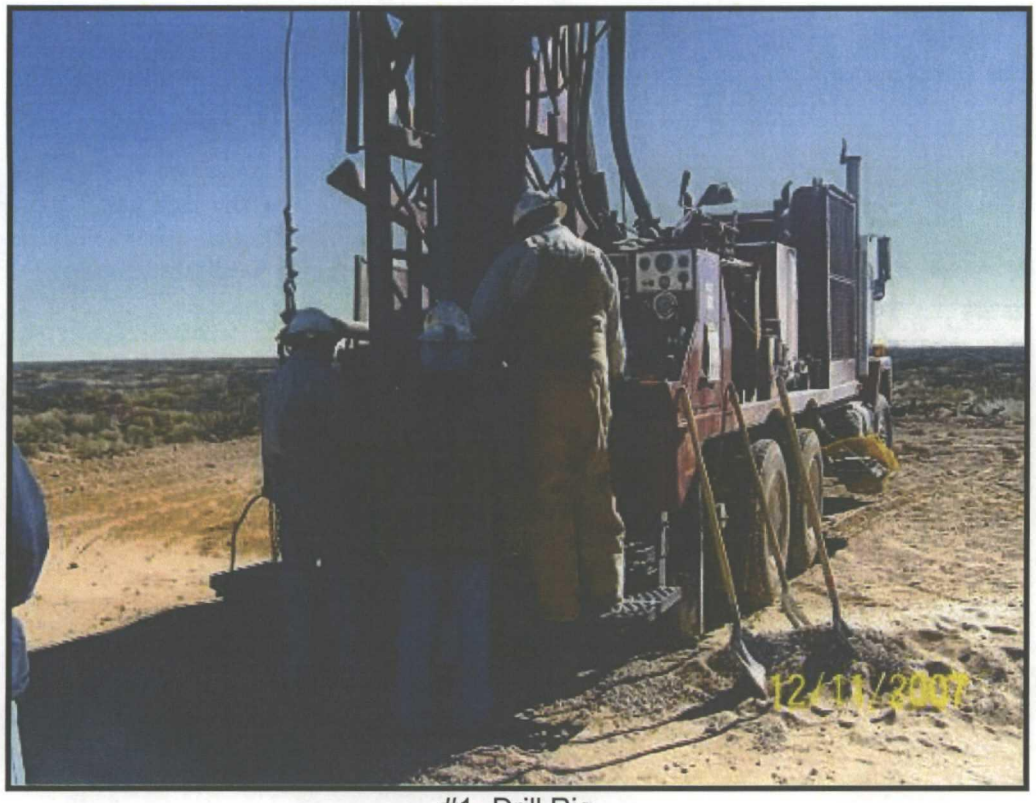
Name: MALJAMAR
Date: 1/29/2008
Scale: 1 inch equals 4000 feet

Location: 032° 51' 14.23" N 103° 48' 26.25" W NAD 83
Caption: Figure 3. Location of nearby water wells, Artesia Aeration. Ring interval 0.5 miles

VIII. Appendix - Supporting Information



Example of five-foot core barrel sampling method (from an unrelated location)



#1- Drill Rig

#2- 51 to 53 feet

#3- 53 to 56 feet

#4- 56 to 58 feet

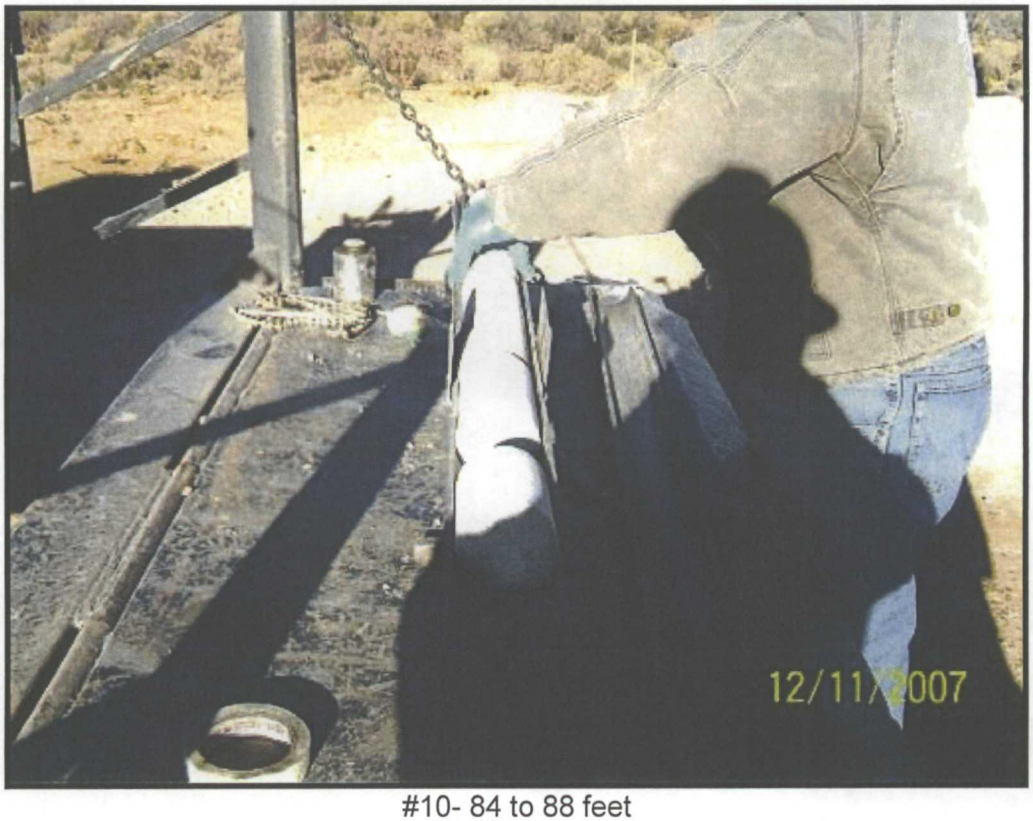
#5- 59 to 64 feet

#6- 64 to 69 feet

#7- 69 to 74 feet

#8- 74 to 79 feet

#9- 79 to 84 feet

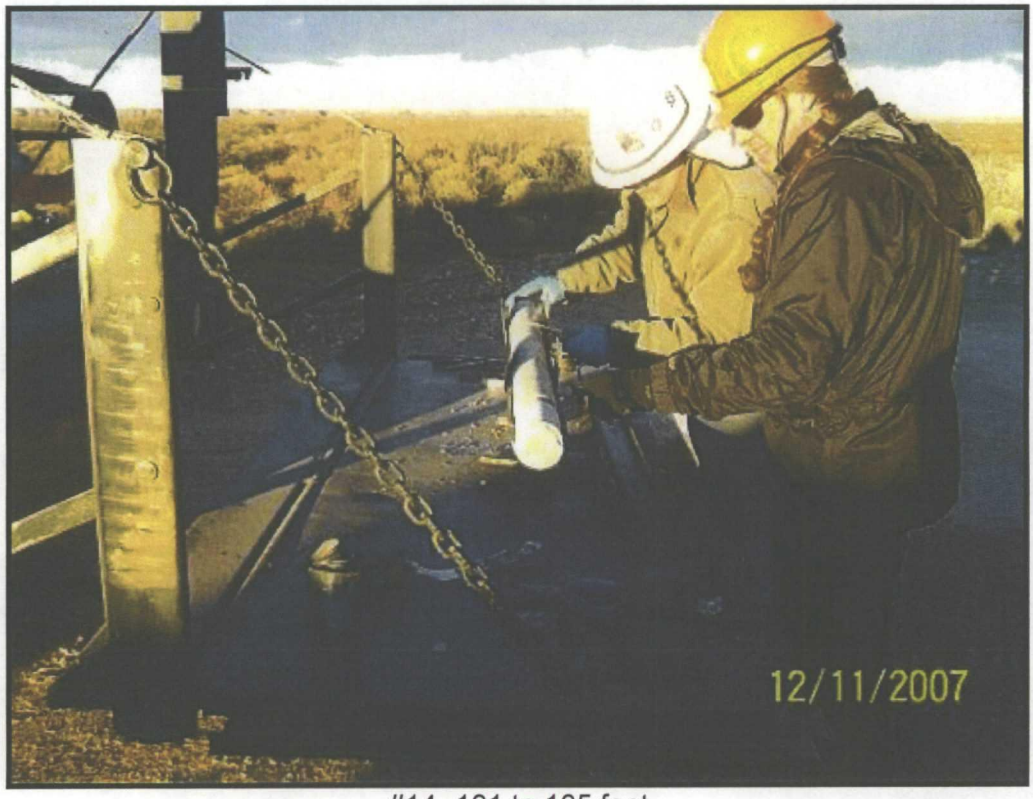


#10- 84 to 88 feet

#11- 88 to 93 feet

#12- 93 to 98 feet

#13- 98 to 101 feet



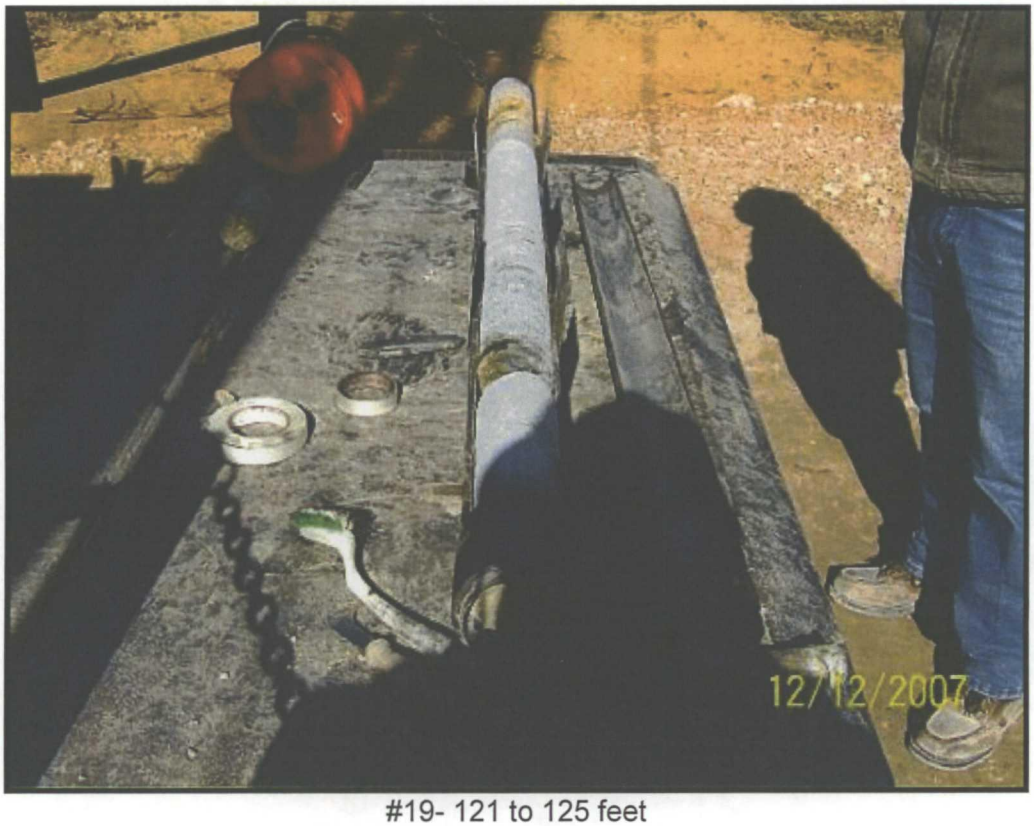
#14- 101 to 105 feet

#15- 105 to 109 feet

#16- 109 to 113 feet

#17- 113 to 117 feet

#18- 117 to 121 feet



#19- 121 to 125 feet

#20- 125 to 130 feet

#21- 130 to 135 feet

#22a- 138 to 142 feet. No break in core samples. Adjusted interval based on measured depth of borehole.

#22b- 138 to 142 feet

#23- 142 to 145 feet

#24- 145 to 150 feet

#25- 150 to 155 feet

#26- 155 to 160 feet

Safety & Environmental Solutions, Inc.

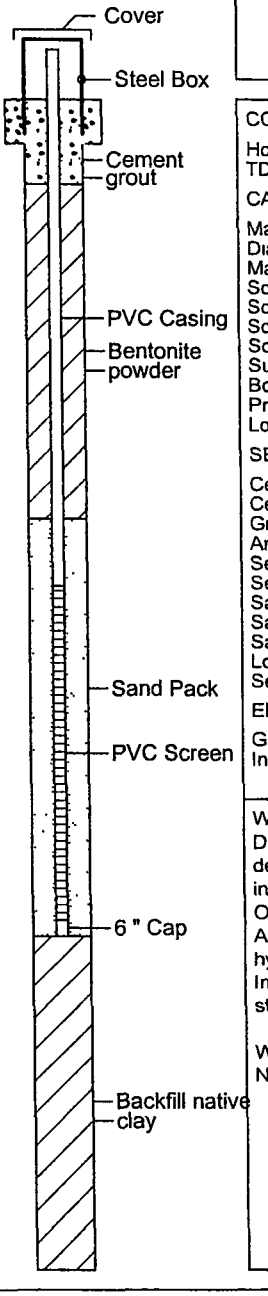
LOG OF WELL MW-1

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started	05/14/05, 0900	Drilled By	Eco/Enviro Drilling
Date, Time Completed	05/14/05, 1430	Logged By	D G Boyer, SESI
Hole Diameter	8 1/4"	Northing Coordinate	
Drilling Method	Hollow Stem Auger	Easting Coordinate	
Drilling Equipment	Foremost-Mobile B-57	Survey By	

Sample Type:
SS Split Spoon (18 in or 24 in)
CB Core Barrel (5 ft)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Type	Recovery (ft)	USCS	GRAPHIC	DESCRIPTION
0	CT		SP		0-4 ft. SAND, poorly graded (uniform), light brown, fine grained, dry
5			CA		4-6 ft. CALICHE, white (chalk color), dry
	CT		SP		6-10 ft. SAND, poorly graded (uniform), light brown, fine grained, frequent small caliche gravels/fragments to 1/4", dry
10					9-10 ft. Increasing caliche gravels and silt
	CT		ML		10-15 ft. SANDY SILT, very light brown, with occasional caliche gravel, very dry
15	CT		SP		15-20 ft. SILTY SAND, light reddish brown, very fine grained, dry
20	CB	1 9			20-23 ft. SAND, reddish-brown, very fine grained, dry
			CL		23-25 ft. CLAY, brown, very stiff, dry, very plastic when wetted
25	CB				25-27 ft. CLAY, brown, very stiff, dry
			CL/MS		27-30 ft. CLAY, green, some platey structure (claystone or mudstone), very fine crystals (calcite?), dry
30	CB	1 8			30-33 ft. CLAY, brown and yellow, dry, crumbly 33-34 ft. CLAY and claystone (mudstone), greenish gray, platey, crumbly, dry 34-35 ft. CLAY, grayish grading to brown at base, crumbly, dry
35					



Well Construction Information

COMPLETION DATA

Hole Depth	35 ft Below LS
TD Inside casing	27.5 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	PVC, threaded
Diameter	2 in ID
Manufacturer	LAIBE
Screen type	Slotted
Screen length	10 ft.
Screen opening	0.020 slot
Scrn placement	15-25 ft. BLS
Sump	None
Bottom Cap	0 5 ft PVC
Protector Casing	Steel box
Lock Key #	- -

SEALS & SAND PACK

Cement seal type	QuikCrete
Cem't placement	0 - ~2 5 ft. BLS
Grout placement	- -
Annular seal type	Aquagel bentonite
Seal volume	4 bg powder, hydrated
Seal placement	2.5-12.5 ft. BLS
Sand pack type	8/16 Oglebay silica
Sand volume	6 bags
Sand placement	12.5-25 ft BLS
Lower Annular seal	Native clay (backfill)
Seal placement	25-35 BLS

ELEVATIONS

Ground elevation	Approx 4035 ft
Inner casing, top	- -

WELL INSTALLATION
Drilled to 35 feet with 8 1/4" auger to determine lithology Backfilled to 25 ft and installed well with 10 ft screen 6 bags 8/16 Oglebay-Norton sand to 12 5 ft., 4 bags Aquagel bentonite powder to 2 5 ft , hydrated QuikCrete cement mix to surface Installed locking steel protection casing, stick-up approximatel 2.5 ft

WELL DEVELOPMENT.
None - well dry, 5/14/05

Notes:
Monitor well dry upon completion
Location approximately 15 ft north of service road between entrance and landfarm Cell 1

\\Sescentralle\SESCentral\Company Files\Artesia Aeration\Boring-well Logs\MW-1 Well.BOR

Safety & Environmental Solutions, Inc.

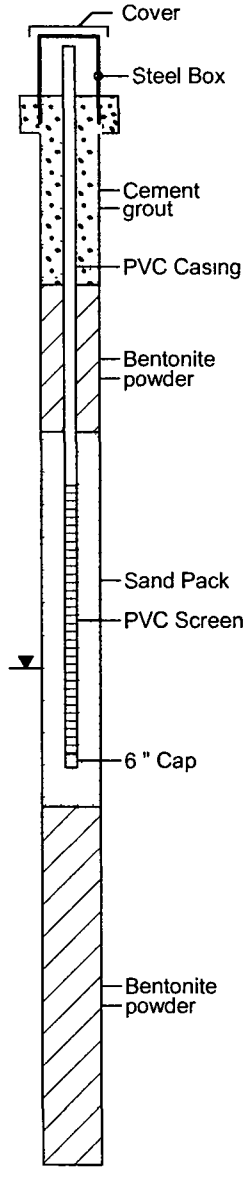
LOG OF WELL MW-2

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started	05/27/05, 1130	Drilled By	Eco/Enviro Drilling
Date, Time Completed	05/27/05, 1700	Logged By	D G Boyer, SESI
Hole Diameter	8 1/4"	Northing Coordinate	
Drilling Method:	Hollow Stem Auger	Easting Coordinate	
Drilling Equipment	Foremost-Mobile B-57	Survey By	

Sample Type:
SS Split Spoon (18 in or 24 in)
CB Core Barrel (5 ft)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Type	Recovery (ft)	USCS	GRAPHIC	DESCRIPTION
0	CT		SP		0-5 ft SAND, reddish brown, fine grained, uniform, dry
5	CT				5-10 ft. SAND, brown to reddish brown, very fine to fine grained, slightly damp, caliche fragments to 1/2 in. at base
10	CT				10-12 ft. SAND, brown to reddish brown, very fine to fine grained
	CT		SP/GP		12-14 ft. GRAVELLY SAND, sand brown, fine grained, with granitic gravels to 1.5 in. Large gravels angular, smaller gravels rounded, quartz common in gravels
			SP		
15	CT		SC		14-15 ft SAND, as above
					15-20 ft. CLAYEY SAND, grading to sandy clay at 20 ft. Possible contact with redbeds.
20	CB	2	CL		20-25 ft. GRAVELLY SILTY CLAY/ GRAVELLY SANDY CLAY, reddish brown, with very hard caliche in tip, gravels are caliche gravels
25	CB	5	CL		25-28.5 ft. CLAY, reddish brown, very dry (redbed)
					28.5-29 ft. CLAY, green-gray-brown striations, very dry
30			CL/CS		29-31 ft. CLAY and CLAYSTONE, clay brown, claystone dark brown, partially consolidated, poorly cemented, very dry
	CB	5	CL		
			MS		31-33.1 ft. CLAY, reddish brown, stiff, very dry, powdery when broken
35			CL/CS		33.1-35 ft CLAYSTONE, dark brown, poorly consolidated, poorly cemented, dry
	CB	5	CS		35-35.9 ft. CLAY and CLAYSTONE, reddish-brown, very dry
40					36.9-40 ft CLAYSTONE, dark brown, poorly cemented, occasional green inclusions (pea size), occasional caliche streak, very dry.



Well Construction Information

COMPLETION DATA

Hole Depth	40 ft Below LS
TD Inside casing	28 29 ft Below TOC

CASING, SCREEN & CAP

Material, joints	PVC, threaded
Diameter	2 in ID
Manufacturer	LAIBE
Screen type	Slotted
Screen length	10 ft
Screen opening	0 020 slot
Scrn placement	15-25 ft BLS
Sump	None
Bottom Cap	0 5 ft PVC
Protector Casing	Above grade steel
Lock Key #	- -

SEALS & SAND PACK

Cement seal type	QuikCrete
Cem't placement	0 - 7 ft BLS
Grout placement	. - -
Annular seal type	Aquagel bentonite
Seal volume	3 bg powder, hydrated
Seal placement	7-12 5 ft. BLS
Sand pack type	8/16 Oglebay silica
Sand volume	9 bags
Sand placement	12 5-25 ft BLS
Lower Annular seal	5 bg powder, hydrated
Seal placement	26 5-40 BLS

ELEVATIONS

Ground elevation	Approx 4035 ft
Inner casing, top	- -

WELL INSTALLATION

Drilled to 40 feet with 8 1/4" auger to determine lithology Backfilled to 25 ft and installed well with 10 ft screen. 5 bags bentonite powder to 26 5 ft , 1 5 bags 8/16 Oglebay-Norton sand to 25 ft , 7 5 bags to 12 5 ft, 3 bags Aquagel bentonite powder to 7 ft , hydrated QuikCrete cement mix to surface Installed locking steel protection casing, stick-up approximatel 3 2 ft above land surface Water at 24 86 BTC

WELL DEVELOPMENT

On 05/29/05 measured DTW at 24 49 ft BTC Pumped out approximately 2.5 gallons and collected water sample

On 06/03/05 measured water at 24 56 ft and pumped 1.5 gallon until dry

Notes
Location south side of service road opposite SE corner of landfarm
Cell 6

\\Sescentral\ses\Central\Company Files\Artesia Aeration\Boring-well Logs\MW-2 Well BOR

Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3-1

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started	10/30/07, 0930	Drilled By	Eco/Enviro Drilling
Date, Time Completed	10/30/07, 1600	Logged By	D G Boyer, P G , SESI
Hole Diameter	8 1/4"	Northing Coordinate	
Drilling Method	Hollow Stem Auger	Easting Coordinate	
Drilling Equipment	Foremost-Mobile B-57	Survey By	

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
0	CB	1 2	SP		0-1.0 ft SAND, reddish-brown, fine grained, blow sand, dry
			GP/SP		1-1.2 ft. CALICHE GRAVEL and limey SAND, gravel to 3/4", white
5	CB	0 5	CA/SP		5-10 ft. Caliche rock in bit; cuttings are very fine to fine grained sand with caliche
10	CB	1 5			10-12.5 ft. CALICHE and SAND, very light brown, very fine grained, with granitic pea-sized pebbles mainly from 11-11.5 ft., dry.
	CB	2 6	SP		12.5-14.5 ft. SAND, light brown, fine grained, occasional caliche gravel to 3/4 - 1 in , sand lightly cemented in places.
15			CA		14.5-15 ft. CALICHE, rock in core tip, very light brown, well cemented, dry
	CB	2 2	GW		15-17.5 ft. SANDY GRAVEL, gravel sizes pea to 2 in., smaller are granitic, larger are caliche, hard limestone with silica; sand light to very light brown, very fine to fine grained, some silt, dry
					17.5-18 ft. SANDY GRAVEL, as above
	CB	2 2	SP		18-19.1 ft. SAND, brown, very fine to fine grained, uniform, occasional caliche rock
			SS		19.1-19.7 ft. SANDSTONE, very light brown, soft, very poorly cemented, dry
20	CB	2 2	SP		20-21.8 ft SAND, brown, very fine to fine grained, uniform, clean, dry
					21.8-22.2 ft. SAND, limey, very light brown to creme color, very fine grained, dry
					22.2-22.9 ft. SAND, limey, with small gravels
	CB	2 5			22.9-25.0 ft. SAND, light brown, very fine to fine grained, uniform, dry
25					

Notes.
Drillers could not drill deeper than 50 ft without adding H2O to move cuttings up auger
Onsite 10/31/07, 0800, measured hole, total depth 44 ft BLS, dry, no water, plugged top 3 ft with wooden plug
Onsite 12/11/07, uncovered plug and measured hole, caved/bridged to 9 5 ft BLS, dry, plugged back to surface
with 12 bags HolePlug bentonite, hydrated

\\Sescentral\ses\Central\Company Files\Artesia Aeration\Bonng-well Logs\MW-3-1 BOR

Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3-1

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started	10/30/07, 0930	Drilled By	Eco/Enviro Drilling
Date, Time Completed	10/30/07, 1600	Logged By	D G Boyer, P G , SESI
Hole Diameter	8 1/4"	Northing Coordinate	
Drilling Method:	Hollow Stem Auger	Easting Coordinate	
Drilling Equipment	Foremost-Mobile B-57	Survey By	

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
25	CB	2.2	SP		25-27 ft. SAND, light brown, very fine grained, dry, compacted 27-27.2 ft. SAND, limey, very light brown, dry, compacted with weak cement
	CB	2 3	SP/SS		27.5-30 ft. SAND, very fine grained, and SANDSTONE, limey, very light brown, very fine grained, poorly cemented, very limey from 29.5-29 8 ft.
30	CB	2 3			30-32.5 ft SAND, light brown, very fine to fine grained, and occasional SANDSTONE, very fine grained, very poorly cemented, dry
	CB	2 6			32 5-35 ft SAND, light brown, very fine to fine grained, occasional limey SANDSTONE, very poorly cemented, dry
35	CB	2 2			35-37 5 ft. SAND, light brown, very fine to fine grained, occasional SANDSTONE lens < 1/2 ft. thick, poorly cemented, dry
	CB	2.2			37.5-40 ft. SAND, light brown, fine grained, and occasional SANDSTONE lens < 1/2 ft. thick, soft, poorly cemented, dry
40	CB	2 4	SP		40-41 3 ft SAND, light brown, very fine to fine grained, dry 41 3-42.4 ft. SAND, reddish-brown, fine grained, dry
	CB	2 6	SS		42.5-43.6 ft. Silty, clayey SANDSTONE, reddish-brown, some very fine grained sand, variable cementing 43 6-45.1 ft SANDSTONE, reddish-brown, very fine to fine grained, at base silty clay and siltstone, dry
45	CB	2.2	CL/CS		45-47.5 ft. "Redbed", CLAY, CLAYSTONE, MUDSTONE, some sand, brown to reddish-brown, generally consolidated, hard, dry
	CB	2 2	SS/CS		47 5-50 ft. "Redbed", SANDSTONE, CLAYSTONE, reddish-brown, soft, friable but generally consolidated, dry
50					

Notes
Drillers could not drill deeper than 50 ft. without adding H2O to move cuttings up auger
Onsite 10/31/07, 0800, measured hole, total depth 44 ft BLS, dry, no water, plugged top 3 ft with wooden plug
Onsite 12/11/07, uncovered plug and measured hole, caved/bridged to 9 5 ft BLS, dry, plugged back to surface with 12 bags HolePlug bentonite, hydrated

\\Sescentral\e\SESCentral\Company Files\Artesia Aeration\Boring-well Logs\MW-3-1 BOR

Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3-2

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started	12/11/07, 0900	Drilled By	Harrison-Cooper, Lubbock
Date, Time Completed	12/13/07, 1200	Logged By	D G Boyer, P G , SESI
Hole Diameter	9-7/8" pilot, 5-1/2" coring	Northing Coordinate	
Drilling Method	Diamond coring bit	Easting Coordinate	
Drilling Equipment	Ingersoll-Rand TH-60	Survey By	

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
50	CT		SP/CA		0-50.7 ft. Drill to 50.8 ft with air, set ____ diameter PVC suface casing to prevent caving of sands. Cuttings are sand, caliche gravels and limestone fragments
	RC	2.0	SL/MS		50 7-52 7 ft. "Redbeds", SILTSTONE, CLAYSTONE, MUDSTONE, CLAY, variable color, light yellowish-brown to reddish-brown, friable, dry
55	RC	3.5	SS/SL		52 7-56.2 ft. SANDSTONE, light brown, very fine grained, friable, well cemented, with some reddish-brown, SILTSTONE
	RC	1.9	SS		56 2-56 7 ft. SANDSTONE, very light brown, silty, well cemented, condensation moisture
			SL		56.7-58.1 ft. SANDY SILTSTONE, light brown to reddish-brown, dry
60	RC	5.0	SS		58 7-63.7 ft. SANDSTONE, light brown, well cemented, with thin siltstone/mudstone lenses at 60.5 and 61.1 ft.
65	RC	5.0			63.7-68.7 ft. SANDSTONE, light brown, very fine grained, hard, well cemented
70	RC	5.0			68.7-73 7 ft. SANDSTONE, very light brown, very fine grained, hard, well cemented
75	RC	5.0			73.7-76.2 ft. SANDSTONE, very light brown, very fine grained, hard, well cemented, dry
			CS		76.2-76 3 ft CLAYSTONE
			SS		76.3-78.7 ft. SANDSTONE
80					

Notes
Harrison-Cooper drillers moved 30 ft NNE of original location, drilled to 50 7 ft and set 6-in ID PVC surface casing with top of casing 1 0 ft above land surface. Coring hole is 5-1/2 in , retrieved core diameter 3 in
See MW-3 well completion log for monitor well installation details

\\Sescentral\e\SESCentral\Company Files\Artesia Aeration\Boring-well Logs\MW-3-2 BOR

Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3-2

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started	12/11/07, 0900	Drilled By	. Harrison-Cooper, Lubbock
Date, Time Completed	12/13/07, 1200	Logged By	D G Boyer, P G , SESI
Hole Diameter	9-7/8" pilot, 5-1/2" coring	Northing Coordinate	:
Drilling Method	Diamond coring bit	Easting Coordinate	
Drilling Equipment:	Ingersoll-Rand TH-60	Survey By	

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft)	USCS	GRAPHIC	DESCRIPTION
80	RC	5 0	SS		78.7-83.7 ft SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry
85	RC	4 6			83.7-88.3 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry
90	RC	4 6			88 3-92.9 ft SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry
95	RC	4 6			92.9-97.5 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry
100	RC	3 6			97.5-101.1 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry
	RC	4 3			101.1-102.2 ft SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry 102.2-105.4 ft. SANDSTONE, with embedded brown-black clay/claystone inclusion, hard, dry
105	RC	4 0	SS/CS		105.2-108.9 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry, with increasing clay lenses at base. Clay thin, hard, well cemented
110			SS/CS		108 9-109 1 ft. SANDSTONE, yellowish-brown, soft 109 1-109.3 ft. SANDSTONE, with brown CLAY inclusions, well cemented

Notes.
Harrison-Cooper drillers moved 30 ft. NNE of original location, drilled to 50.7 ft and set 6-in ID PVC surface casing with top of casing 1 0 ft above land surface Coring hole is 5-1/2 in , retrieved core diameter 3 in
See MW-3 well completion log for monitor well installation details

\\Secentralw\SESCentral\Company Files\Artesia Aeration\Boring-well Logs\MW-3-2 BOR

Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3-2

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started	12/11/07, 0900	Drilled By	Harrison-Cooper, Lubbock
Date, Time Completed	12/13/07, 1200	Logged By	D G Boyer, P G , SESI
Hole Diameter:	9-7/8" pilot, 5-1/2" coring	Northing Coordinate	
Drilling Method	Diamond coring bit	Easting Coordinate	
Drilling Equipment.	Ingersoll-Rand TH-60	Survey By	

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft)	USCS	GRAPHIC	DESCRIPTION
110	RC	4.1	SS/CS		109.3-109.5 ft. SANDSTONE and MUDSTONE, fractured but hard and dry 109.5-110.9 ft. SANDSTONE, with brown CLAY, inclusions, hard, dry 110 9-112.7 ft. SANDSTONE, light brown, very hard 112.7-113.0 ft. CLAY, hard, cemented (in core tip)
115	RC	4.0	SS SS/CL LS SS/CL		113.0-115.1ft. SANDSTONE, light brown, very hard 115 1-115.4 ft. SANDSTONE, with CLAY inclusions 115.4-116.7 ft. LIMESTONE, light gray, with some microcrystals, very hard (wet-likely condensation or water from cleaning core tubes)
120	RC	4 0	SS LS SS SS/CL		116.7-117 0 ft SANDSTONE and CLAY 117.0-118.0 ft. SANDSTONE, yellowish-brown 118 0-118.1 ft. LIMESTONE, gray 118.1-119.5 ft SANDSTONE
125	RC	4 4	LS CS LS LS/SS		119.5-121.0 ft. SANDSTONE, CLAY 121-121.5 ft. LIMESTONE, light gray, very hard 121.5-122.3 ft. CLAYSTONE, light brown, mottled, fractures 122.3-123.9 ft LIMESTONE, light gray, oolitic, fossil inclusions 123.9-125.4 ft. LIMESTONE grading to SANDSTONE, SANDSTONE very light brown, very hard, core dry
130	RC	4 9	SS MS		125.4-125.9 ft. SANDSTONE 125.9-126.7 ft. MUDSTONE, gray, sandstone fragments 126.7-128 9 ft "Redbeds", CLAY and CLAYSTONE, very hard, cemented, core dry but moist on outer surface only (condensation/wash water, driller cleaning barrel with water, not completly dry going in hole) 129 ft. Fracture zone, moist 129-130.3 ft. CLAY, "redbeds", moisture on core surface
135	RC	4 3	CL/CS		130.3-132.4 ft. CLAY, "redbeds", moisture on core surface 132 4-134 6 ft. CLAYSTONE/MUDSTONE "redbeds", hard, dry
140					137.7-141.7 ft CLAY and CLAYSTONE, "redbeds", some fractured rock, dry

Notes:
Harrison-Cooper drillers moved 30 ft NNE of original location, drilled to 50.7 ft. and set 6-in ID PVC surface casing with top of casing 1 0 ft above land surface Coring hole is 5-1/2 in., retrieved core diameter 3 in.
See MW-3 well completion log for monitor well installation details

\\Sescentralw\SESCentral\Company Files\Artesia Aeration\Boring-well Logs\MW-3-2 BOR

Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3-2

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started	12/11/07, 0900	Drilled By:	Harrison-Cooper, Lubbock
Date, Time Completed	12/13/07, 1200	Logged By	D G Boyer, P.G , SESI
Hole Diameter	9-7/8" pilot, 5-1/2" coring	Northing Coordinate	
Drilling Method	Diamond coring bit	Easting Coordinate	
Drilling Equipment	Ingersoll-Rand TH-60	Survey By	

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
140	RC	4 0	CL/CS		141.7-143.3 ft. CLAY and CLAYSTONE, "redbeds", brown
	RC	3 6	CS		143.3-145 3 ft. CLAYSTONE, mottled then gray, hard, dry
145	RC	4 6	CL/CS		145.3-146.8 ft. CLAY and CLAYSTONE "redbed", fractured 146.8-147.1 ft CLAY and CLAYSTONE "redbed"
			CL		147.1-147.5 ft. CLAY, gray
			CL/CS		147.5-149.9 ft CLAY and CLAYSTONE "redbed"
150	RC	4.7			149.9-151.2 ft. CLAY and CLAYSTONE "redbed"
					151 2-152.4 ft CLAY and CLAYSTONE "redbed"
					152.4-154.6 ft. CLAY and CLAYSTONE "redbed", dry, fractures at 153.4 ft.
155	RC	5 0			154.6-159 6 CLAY and CLAYSTONE "redbed", reddish-brown, fractured in places, dry
160					
165					
170					

Notes
Harrison-Cooper drillers moved 30 ft NNE of original location, drilled to 50 7 ft and set 6-in. ID PVC surface casing with top of casing 1 0 ft above land surface Coring hole is 5-1/2 in , retrieved core diameter 3 in.
See MW-3 well completion log for monitor well installation details

\\Sescentral\ESCentral\Company Files\Artesia Aeration\Boring-well Logs\MW-3-2 BOR

Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3-3

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started	12/11/07, 0930	Drilled By	. Eco/Enviro Drilling
Date, Time Completed	12/11/07, 1130	Logged By	D G Boyer, P G., SESI
Hole Diameter	8 1/4"	Northing Coordinate	
Drilling Method	Hollow Stem Auger	Easting Coordinate	.
Drilling Equipment	Foremost-Mobile B-57	Survey By	

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
0	CB	1 4	AR		0-1 4 ft. FILL MATERIAL used to construct well pad, caliche with sand, some clay
	CB	2 0	SP		2.5-5 ft. SAND, reddish-brown, very fine grained, some roots, slightly damp
5	CB	2 2			5-6.5 ft. SAND, reddish-brown, very fine grained, slightly damp
	CB	1 6	CA		6.5-7 2 ft. CALICHE, very light brown (creme color), fragments soft to hard 7.5-9.1 ft. CALICHE, light brown (creme color), soft to hard, some fragments to 1.5 in., becoming sandy at 9.1 ft.
10	CB	2 4	CA/SW		10-12 5 ft CALICHE, sandy, becoming GRAVELLY SAND, sand creme-colored becoming light brown. Caliche and limestone gravels to 1.5 in., very hard
	CB	2 0	SW		12.5-15 ft. GRAVELLY SAND, light brown, caliche/limestone gravels, some small granitic gravels to 1/4 in
15					
20					
25					

Notes
Plugged back to surface with 7 bags HolePlug bentonite, hydrated

\\Sescentral\e\SESCentral\Company Files\Artesia Aeration\Borng-well Logs\MW-3-3 BOR

Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3 (Composite)

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started.	. 10/30/07; 0900	Drilled By.	: Harrison-Cooper, Lubbock
Date, Time Completed	12/13/07, 1200	Logged By.	: D.G Boyer, P.G., SESI
Hole Diameter:	. 9-7/8" pilot, 5-1/2" coring	Northing Coordinate	:
Drilling Method:	: Diamond coring bit	Easting Coordinate	:
Drilling Equipment:	: Ingersoll-Rand TH-60	Survey By	:

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
0	CB	1 4	AR		Detailed log copied from borehole MW-3-3. 0-1.4 ft. FILL MATERIAL used to construct well pad, caliche with sand, some clay
	CB	2.0	SP		2.5-5 ft. SAND, reddish-brown, very fine grained, some roots, slightly damp
5	CB	2.2			5-6.5 ft. SAND, reddish-brown, very fine grained, slightly damp
	CB	1.6	CA		6.5-7.2 ft. CALICHE, very light brown (creme color), fragments soft to hard 7.5-9.1 ft. CALICHE, light brown (creme color), soft to hard, some fragments to 1.5 in., becoming sandy at 9.1 ft.
10	CB	2.4	CA/SW		10-12.5 ft. CALICHE, sandy, becoming GRAVELLY SAND, sand creme-colored becoming light brown. Caliche and limestone gravels to 1.5 in., very hard
	CB	2 0	SW		12.5-15 ft. GRAVELLY SAND, light brown, caliche/limestone gravels, some small granitic gravels to 1/4 in.
15	CB	2.2	GW		Detailed log copied from borehole MW-3-1. 15-17.5 ft. SANDY GRAVEL, gravel sizes pea to 2 in., smaller are granitic, larger are caliche, hard limestone with silica; sand light to very light brown, very fine to fine grained, some silt, dry 17.5-18 ft. SANDY GRAVEL, as above
	CB	2.2	SP		18-19.1 ft. SAND, brown, very fine to fine grained, uniform, occasional caliche rock
			SS		19.1-19.7 ft. SANDSTONE, very light brown, soft, very poorly cemented, dry
20	CB	2 2	SP		20-21.8 ft. SAND, brown, very fine to fine grained, uniform, clean, dry 21.8-22.2 ft. SAND, limey, very light brown to creme color, very fine grained, dry 22.2-22.9 ft. SAND, limey, with small gravels
	CB	2.5			22.9-25.0 ft. SAND, light brown, very fine to fine grained, uniform, dry
25					

Notes
Eco/Enviro Drilling drilled to 50 ft.; could not drill deeper consolidated formation.
Harrison-Cooper drillers moved 30 ft NNE of original location, drilled to 50 7 ft and set 6-in. ID PVC surface casing with top of casing 1.0 ft above land surface Coring hole is 5-1/2 in , retrieved core diameter 3 in
See MW-3 well completion log for monitor well installation details

\\Sescentral\e\SESCentral\Company Files\Artesia Aeration\Boring-well Logs\MW-3 composite BOR

Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3 (Composite)

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started.	. 10/30/07, 0900	Drilled By:	. Harrison-Cooper, Lubbock
Date, Time Completed	· 12/13/07; 1200	Logged By.	D.G Boyer, P.G., SESI
Hole Diameter	9-7/8" pilot, 5-1/2" coring	Northing Coordinate	:
Drilling Method.	. Diamond coring bit	Easting Coordinate	:
Drilling Equipment:	Ingersoll-Rand TH-60	Survey By	:

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
25	CB	2.2	SP		25-27 ft. SAND, light brown, very fine grained, dry, compacted 27-27.2 ft. SAND, limey, very light brown, dry, compacted with weak cement
	CB	2.3	SP/SS		27.5-30 ft. SAND, very fine grained, and SANDSTONE, limey, very light brown, very fine grained, poorly cemented, very limey from 29.5-29.8 ft.
30	CB	2.3			30-32.5 ft. SAND, light brown, very fine to fine grained, and occasional SANDSTONE, very fine grained, very poorly cemented, dry
	CB	2 6			32.5-35 ft. SAND, light brown, very fine to fine grained, occasional limey SANDSTONE, very poorly cemented, dry
35	CB	2 2			35-37.5 ft. SAND, light brown, very fine to fine grained, occasional SANDSTONE lens < 1/2 ft. thick, poorly cemented, dry
	CB	2.2			37.5-40 ft. SAND, light brown, fine grained, and occasional SANDSTONE lens < 1/2 ft. thick, soft, poorly cemented, dry
40	CB	2 4	SP		40-41 3 ft. SAND, light brown, very fine to fine grained, dry 41.3-42.4 ft. SAND, reddish-brown, fine grained, dry
	CB	2 6	SS		42.5-43.6 ft Silty, clayey SANDSTONE, reddish-brown, some very fine grained sand, variable cementing 43.6-45.1 ft. SANDSTONE, reddish-brown, very fine to fine grained, at base silty clay and siltstone, dry
45	CB	2.2	CL/CS		45-47.5 ft. "Redbed", CLAY, CLAYSTONE, MUDSTONE, some sand, brown to reddish-brown, generally consolidated, hard, dry
	CB	2.2	SS/CS		47.5-50 ft. "Redbed", SANDSTONE, CLAYSTONE, reddish-brown, soft, friable but generally consolidated, dry
50					

Notes
Eco/Enviro Drilling drilled to 50 ft , could not drill deeper consolidated formation
Harrison-Cooper drillers moved 30 ft. NNE of original location, drilled to 50.7 ft and set 6-in ID PVC surface casing with top of casing 1.0 ft above land surface Coring hole is 5-1/2 in , retrieved core diameter 3 in.
See MW-3 well completion log for monitor well installation details

\\Sescentral\SESCentral\Company Files\Artesia Aeration\Boring-well Logs\MW-3 composite BOR

Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3 (Composite)

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started	10/30/07, 0900	Drilled By:	: Harrison-Cooper, Lubbock
Date, Time Completed	12/13/07, 1200	Logged By:	: D.G Boyer, P G., SESI
Hole Diameter	9-7/8" pilot, 5-1/2" coring	Northing Coordinate	.
Drilling Method	Diamond coring bit	Easting Coordinate	:
Drilling Equipment	Ingersoll-Rand TH-60	Survey By	.

Sample Type.
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
50	CT		SP/CA		Detailed log copied from borehole MW-3-2. 50-50.7 ft Drill to 50.8 ft with air, set 6-in. ID PVC suface casing to prevent caving of sands Cuttings are sand, caliche gravels and limestone fragments
	RC	2 0	SL/MS		50 7-52.7 ft. "Redbeds", SILTSTONE, CLAYSTONE, MUDSTONE, CLAY, variable color, light yellowish-brown to reddish-brown, friable, dry
55	RC	3.5	SS/SL		52.7-56.2 ft. SANDSTONE, light brown, very fine grained, friable, well cemented, with some reddish-brown, SILTSTONE
	RC	1 9	SS		56.2-56 7 ft. SANDSTONE, very light brown, silty, well cemented, condensation moisture
			SL		56.7-58.1 ft. SANDY SILTSTONE, light brown to reddish-brown, dry
60	RC	5 0	SS		58.7-63.7 ft. SANDSTONE, light brown, well cemented, with thin siltstone/mudstone lenses at 60.5 and 61.1 ft.
65	RC	5.0			63.7-68.7 ft. SANDSTONE, light brown, very fine grained, hard, well cemented
70	RC	5.0			68.7-73.7 ft. SANDSTONE, very light brown, very fine grained, hard, well cemented
75					73.7-76.2 ft. SANDSTONE, very light brown, very fine grained, hard, well cemented, dry

Notes
Eco/Enviro Drilling drilled to 50 ft , could not drill deeper consolidated formation.
Harrison-Cooper drillers moved 30 ft NNE of original location, drilled to 50 7 ft and set 6-in ID PVC surface casing with top of casing 1 0 ft above land surface. Coring hole is 5-1/2 in , retrieved core diameter 3 in.
See MW-3 well completion log for monitor well installation details

\\Sescentral\e\SESCentral\Company Files\Artesia Aeration\Boring-well Logs\MW-3 composite BOR

Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3 (Composite)

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started	10/30/07, 0900	Drilled By	Harrison-Cooper, Lubbock
Date, Time Completed	12/13/07, 1200	Logged By	D G Boyer, P.G , SESI
Hole Diameter.	9-7/8" pilot, 5-1/2" coring	Northing Coordinate	.
Drilling Method	Diamond coring bit	Easting Coordinate	.
Drilling Equipment.	Ingersoll-Rand TH-60	Survey By	:

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
75	RC	5.0	SS CS		76.2-76.3 ft CLAYSTONE 76.3-78.7 ft. SANDSTONE
80	RC	5 0			78.7-83.7 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry
85	RC	4.6			83.7-88.3 ft SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry
90	RC	4.6	SS		88 3-92.9 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry
95	RC	4.6			92.9-97.5 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry
100					97.5-101.1 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry

Notes
Eco/Enviro Drilling drilled to 50 ft., could not drill deeper consolidated formation
Harrison-Cooper drillers moved 30 ft. NNE of original location, drilled to 50 7 ft and set 6-in ID PVC surface casing with top of casing 1 0 ft above land surface Coring hole is 5-1/2 in , retrieved core diameter 3 in
See MW-3 well completion log for monitor well installation details

\\Sescentral\e\SESCentral\Company Files\Artesia Aeration\Boring-well Logs\MW-3 composite BOR

Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3 (Composite)

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started	10/30/07, 0900	Drilled By	Harrison-Cooper, Lubbock
Date, Time Completed	12/13/07, 1200	Logged By:	D.G Boyer, P G., SESI
Hole Diameter	9-7/8" pilot, 5-1/2" coring	Northing Coordinate	.
Drilling Method	Diamond coring bit	Easting Coordinate	.
Drilling Equipment	Ingersoll-Rand TH-60	Survey By	:

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
100	RC	3 6	SS		101.1-102.2 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry
	RC	4.3	SS/CS		102 2-105.4 ft. SANDSTONE, with embedded brown-black clay/claystone inclusion, hard, dry
105	RC	4.0			105.2-108.9 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry, with increasing clay lenses at base. Clay thin, hard, well cemented
110	RC	4.1	SS/CS		108.9-109.1 ft. SANDSTONE, yellowish-brown, soft 109.1-109.3 ft. SANDSTONE, with brown CLAY inclusions, well cemented 109.3-109.5 ft. SANDSTONE and MUDSTONE, fractured but hard and dry 109.5-110.9 ft. SANDSTONE, with brown CLAY, inclusions, hard, dry 110.9-112.7 ft. SANDSTONE, light brown, very hard 112.7-113.0 ft. CLAY, hard, cemented (in core tip)
115	RC	4.0	SS		113.0-115.1ft. SANDSTONE, light brown, very hard
			SS/CL		115.1-115.4 ft. SANDSTONE, with CLAY inclusions
			LS		115.4-116.7 ft. LIMESTONE, light gray, with some microcrystals, very hard (wet-likely condensation or water from cleaning core tubes)
			SS/CL		
	RC	4 0	SS		116.7-117.0 ft SANDSTONE and CLAY
			LS		117.0-118.0 ft. SANDSTONE, yellowish-brown
			SS		118.0-118.1 ft. LIMESTONE, gray 118.1-119.5 ft. SANDSTONE
120			SS/CL		119.5-121.0 ft. SANDSTONE, CLAY
			LS		121-121.5 ft. LIMESTONE, light gray, very hard
			CS		121.5-122.3 ft. CLAYSTONE, light brown, mottled, fractures
			LS		122.3-123.9 ft. LIMESTONE, light gray, oolitic, fossil inclusions
125			LS/SS		123.9-125.4 ft. LIMESTONE grading to SANDSTONE, SANDSTONE very light brown, very hard, core dry

Notes:
Eco/Enviro Drilling drilled to 50 ft., could not drill deeper consolidated formation.
Harrison-Cooper drillers moved 30 ft NNE of original location, drilled to 50.7 ft and set 6-in. ID PVC surface casing with top of casing 1 0 ft above land surface Coring hole is 5-1/2 in., retrieved core diameter 3 in
See MW-3 well completion log for monitor well installation details

Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3 (Composite)

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started	10/30/07, 0900	Drilled By	Harrison-Cooper, Lubbock
Date, Time Completed	12/13/07, 1200	Logged By	D G Boyer, P G , SESI
Hole Diameter	9-7/8" pilot, 5-1/2" coring	Northing Coordinate	
Drilling Method.	Diamond coring bit	Easting Coordinate	.
Drilling Equipment	Ingersoll-Rand TH-60	Survey By	

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
125	RC	4.4	LS/SS		
			SS		125.4-125.9 ft. SANDSTONE
			MS		125.9-126.7 ft. MUDSTONE, gray, sandstone fragments
	RC	4.9			126.7-128.9 ft. "Redbeds", CLAY and CLAYSTONE, very hard, cemented, core dry but moist on outer surface only (condensation/wash water, driller cleaning barrel with water, not completly dry going in hole)
					129 ft. Fracture zone, moist
130					129-130.3 ft. CLAY, "redbeds", moisture on core surface
	RC	4.3			130.3-132.4 ft. CLAY, "redbeds", moisture on core surface
					132.4-134.6 ft. CLAYSTONE/MUDSTONE "redbeds", hard, dry
135			CL/CS		
	RC	4.0			137.7-141.7 ft. CLAY and CLAYSTONE, "redbeds", some fractured rock, dry
140					
	RC	3.6			141.7-143.3 ft. CLAY and CLAYSTONE, "redbeds", brown
			CS		143.3-145.3 ft. CLAYSTONE, mottled then gray, hard, dry
145			CL/CS		145.3-146.8 ft. CLAY and CLAYSTONE "redbed", fractured
					146.8-147.1 ft. CLAY and CLAYSTONE "redbed"
	RC	4.6	CL		147.1-147.5 ft. CLAY, gray
			CL/CS		147.5-149.9 ft. CLAY and CLAYSTONE "redbed"
150					

Notes:
Eco/Enviro Drilling drilled to 50 ft ; could not drill deeper consolidated formation
Harrison-Cooper drillers moved 30 ft NNE of original location, drilled to 50 7 ft and set 6-in ID PVC surface casing with top of casing 1 0 ft above land surface. Coring hole is 5-1/2 in , retrieved core diameter 3 in.
See MW-3 well completion log for monitor well installation details

\\Sescentral\ES\Central\Company Files\Artesia Aeration\Boring-well Logs\MW-3 composite BOR

Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3 (Composite)

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started	10/30/07, 0900	Drilled By	Harrison-Cooper, Lubbock
Date, Time Completed	12/13/07, 1200	Logged By	D G Boyer, P.G , SESI
Hole Diameter.	9-7/8" pilot, 5-1/2" coring	Northing Coordinate	
Drilling Method.	Diamond coring bit	Easting Coordinate	
Drilling Equipment	Ingersoll-Rand TH-60	Survey By	

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
150	RC	4.7	CL/CS		149.9-151.2 ft. CLAY and CLAYSTONE "redbed" 151.2-152.4 ft. CLAY and CLAYSTONE "redbed" 152.4-154.6 ft. CLAY and CLAYSTONE "redbed", dry, fractures at 153.4 ft.
155	RC	5.0			154.6-159.6 CLAY and CLAYSTONE "redbed", reddish-brown, fractured in places, dry
160					
165					
170					
175					

Notes
Eco/Enviro Drilling drilled to 50 ft , could not drill deeper consolidated formation.
Harrison-Cooper drillers moved 30 ft NNE of original location, drilled to 50 7 ft and set 6-in ID PVC surface casing with top of casing 1 0 ft above land surface Coring hole is 5-1/2 in , retrieved core diameter 3 in
See MW-3 well completion log for monitor well installation details

\\Sescentral\e\SESCentral\Company Files\Artesia Aeration\Boring-well Logs\MW-3 composite BOR

NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

BILL RICHARDSON
Governor
Joanna Prukop
Cabinet Secretary

Mark E. Fesmire, P.E.
Director
Oil Conservation Division

February 21, 2008

Mr. Jim Wilson
Artesia Aeration, LLC
PO Box 310
Hobbs, New Mexico 88240

RE: Summary of February 20, 2008 Artesia Aeration Site Visit and February 21, 2008 Follow-up Phone Call Regarding Ground Water Assessment for Proposed Permit Modification at Artesia Aeration: Permit NM-01-0030
Location: Section7, Township 17 South, Range 32 East, NMPM
Lea County, New Mexico

Dear Mr. Wilson:

The New Mexico Oil Conservation Division (OCD) appreciates Artesia Aeration's effort to include the OCD in the progress of the site assessment regarding ground water investigation for the proposed modification. The OCD would like to provide you with a brief summary of the items observed and discussed during the February 20, 2008 site visit and the follow-up telephone conversation on February 21, 2008.

Observations:

OCD representatives (Wayne Price and Brad Jones) observed the presence of water and damp/wet soil in six of the eleven exploratory trenches excavated within the proximity of the MW-2. OCD also retrieved a full 3-foot bailer of water from MW-2 during the visit.

- Trench #1 had damp/wet soil at the bottom due to sidewall of trench caving in. Sidewalls indicated dampness approximately 4-5 feet above bottom of trench.
- Trench #2 had approximately 1-1.5 feet of standing water present at the bottom of the trench. Sidewalls indicated dampness approximately 2-3 feet above water line.
- Trench #3 had damp soil at the bottom due to sidewall of trench caving in. Trench #3 had approximately 1-1.5 feet of standing water present at the bottom on February 7, 2008 site visit. Sidewalls indicated dampness approximately 4-5 feet above water line.
- Trench #4 had approximately 0.5-1 feet of standing water present at the bottom of the trench. Sidewalls indicated dampness approximately 2-3 feet above water line.
- Trench #5 was dry at the bottom of the trench.
- Trench #6 was dry at the bottom of the trench.
- Trench #7 had approximately 2-3.5 feet of standing water present at the bottom of the trench. Sidewalls indicated dampness approximately 5-7 feet above water line.
- Trench #8 had approximately 1-2 feet of standing water present at the bottom of the trench. Sidewalls indicated dampness approximately 3-4 feet above water line.
- Trench #9 was dry at the bottom of the trench.
- Trench #10 was dry at the bottom of the trench.

- Trench #11 was dry at the bottom of the trench.

The approximate depth of each trench was noted in OCD's field notes. OCD took photos of each trench and surrounding features. An abandoned oil/gas well was noted and logged into the field notes. The well was in close proximately to the MW-D1. The dry hole marker was hard to read and was logged in as being in se/4 se/4 section 6-Ts17s-R32e Mitchell G Lea County, Rider Scott co.

OCD representatives observed the progress of the removal of DAF material from the dedicated Navajo Refinery landfarm cell. OCD had recently discovered that this material was not approved for this landfarm. Mr. Brad Jones performed a site inspection and record review concerning this issue on February 07, 2008. A berm has been constructed around the remaining material awaiting removal. Dusty Wilson, a representative for Artesia Aeration, informed OCD that the material was being transported to CRI for proper disposal. OCD took a photo.

After the site visit, OCD drove the outside perimeter of the facility including the proposed landfill area to observe the nature and extent of surrounding surface features including surface water run-on and run-off areas. OCD was able to match the small arroyos or ditches with the aero photo supplied to us.

Items discussed during the February 20, 2008 site visit:

Dusty Wilson, a representative for Artesia Aeration, provided OCD a site tour and overview of the exploratory trenches. During the tour, Mr. Wilson expressed that the trackhoe operator observed water entering trenches 7 and 8 from the direction of MW-2. Mr. Wilson provided OCD with a site map (Topographic Survey of Artesia Aeration dated 1/29/08) with the approximate locations and depths of each excavated trench. Additional information on the map indicated the presence of water and the amount of time for the water to develop in the trench.

OCD requested a site map that would depict the exact location of each trench and its distance from MW-2. OCD also expressed the importance of mapping the geologic strata across the site, based upon the observed geology of each trench.

Dusty Wilson, a representative for Artesia Aeration, expressed interest to use additional exploratory trenches to investigate the proposed area of the modification. Mr. Wilson inquired about locations for additional trenches and provided a site map indicating the locations. OCD expressed the ability to trench to appropriate depths and the ability of the results of the work to support the proposal. Based upon the conversation, it was OCD understanding that Artesia Aeration was undecided about the technique in which the investigation would continue.

Dusty Wilson and Larry Parker provided OCD a rational why shallow groundwater may be present. They concluded that surface storm water coming from the north and east drainages may have been trapped in the area of MW-2 due to the elevation of the highway. Mr. Parker noted that some years ago there was a large rainfall event in that area which caused flooding and closure of highway 82.

Items discussed during the February 21, 2008 telephone call:

OCD (Wayne Price and Brad Jones) contacted Mr. Dusty Wilson to clarify items discussed during the February 20, 2008 site visit. OCD indicated that the rules specify there must be a 100 foot separation between the bottom of the landfill and groundwater, however the rule does not express a horizontal distance from groundwater, but there are other siting requirements in addition to the 100 foot rule. OCD expressed its concern that trenching may provide valuable information concerning shallow groundwater

but, it would not adequately demonstrate if there is deeper groundwater underlying the site. While Artesia Aeration has drilled one deep monitor well on the northwest side of the proposed landfill area, OCD indicated that one well will not be sufficient to demonstrate that no groundwater exist under the entire site.

In order to assist Artesia Aeration and to prevent the "moving target syndrome" OCD recommended that Artesia Aeration and their hydrologist or geohydrologist schedule a meeting with OCD to establish a plan to properly characterize the geology and groundwater beneath the area proposed in the modification prior to taking any further action. The goal is to establish an assessment plan that will provide the appropriate information to determine if the site is viable for the pursuit of the proposed modification. Mr. Wilson expressed his concern that additional work would be very expensive and may cost as much as $100,000. OCD pointed out that is the exact reason we need to have a technical meeting so Artesia understands what the rule requires and what will satisfy those requirements.

The OCD hopes that this summary will help clarify any outstanding issues and looks forward to our meeting. If you have any questions regarding this matter, please do not hesitate to contact Brad A. Jones of my staff at 505) 476-3487 or brad.a.jones@state.nm.us.

Sincerely,

Wayne Price
Environmental Bureau Chief

LWP/baj

cc: OCD District I Office, Hobbs