AE Order Number Banner

Report Description

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App Number: pGRL1034950874

1RP - 2669

NEW MEXICO SALT WATER DISPOSAL COMPANY

7/27/2016

NMSWD

Leking, Geoffrey R, EMNRD

From: VonGonten, Glenn, EMNRD
Sent: Monday, June 27, 2011 10:44 AM
To: whearth@msn.com
Cc: mikeg@vadose.us; Bailey, Jami, EMNRD; jromero@slo.state.nm.us; jljohnson@leaco.net; hsncpbm@leaco.net; Stevenson, Tod, DGF; Hill, Larry, EMNRD; Sanchez, Daniel J., EMNRD; Leking, Geoffrey R, EMNRD
Subject: PR-146C NMSWD Remediation Protocol von.doc
Attachments: PR-146C NMSWD Remediation Protocol von.doc

All,

Please forward to anyone that I may have missed.

Mike,

As we discussed in our last teleconference, NMSWDCo must submit an appropriate number of maps before OCD will approve any workplans.

I have inserted OCD's comments in blue. Please review and get back to me to set up a teleconference. OCD will require NMSWDCo to meet all of the small landfarm soil standards specified in Part 36.

OCD will also need reference material on the Bromide/Chloride ratio. The log-log plot did not make this topic clear. I would prefer a peer-review publication. Absent a clear demonstration that all of water at this site is from spilled produced water, OCD must assume that the water is ground water and protectable.

After final review of NMSWDCo's next revision, OCD will stipulate that the success or failure of the remediation program will be determined at the end of eight weeks.

Glenn

2669

PR-146C

Remediation and Site Restoration Protocol
New Mexico Salt Water Disposal Co.
1RP-2669

(From email of 6/24/2011: *We expect that we can complete the advancement of the cretaceous water well and the initial excavation & treatment of the hydrocarbons within **two weeks** of the commencement of the project. The 50' square test plot can be treated with ion exchange amendments within **four weeks** of the commencement of the project & we anticipate **final completion of the ion exchange treatment area two weeks later**. The **final organic amendment treatment will take two more**. So, eight weeks start to finish.)*

'Rory McMinn'; Roy Rascon ; Elliot Werner; Wayne Price; Lloyd Deuel; Jim Read ; Bailey, Jami, EMNRD; Sanchez, Daniel J., EMNRD

1.0 Purpose

This protocol is to provide a detailed outline of the steps to be employed in the delineation and remediation of the New Mexico Salt Water Disposal Company's hydrocarbon and brine spill in Lea County, New Mexico.

2.0 Scope

This protocol is site specific for the Johnson remediation project.

3.0 Preliminary

Prior to any field operations, Whole Earth Environmental shall conduct the following activities:

3.1 Client Review

3.1.1 Whole Earth shall meet with assigned personnel within NMSWD, NMSLO and the NMOCD to review and approve this protocol and incorporate NOD comments.

3.1.2 Changes to this protocol will be documented and submitted for final review by all parties prior to the initiation of actual field work.

4.0 Safety

4.1 Prior to work on the site, Whole Earth shall obtain the location and phone numbers of the nearest emergency medical treatment facility. We will review all safety related issues with the appropriate client personnel, sub-contractors and exchange phone numbers.

4.2 A tailgate safety meeting shall be held and documented each day. All sub-contractors must attend and sign the daily log-in sheet.

4.3 Any contractors allowed on to location must be wearing sleeved shirts, steel toed boots, and long pants. Each vehicle must be equipped with two way communication capabilities.

4.4 Prior to any excavation or boring, New Mexico One Call will be notified. If lines are discovered within the area to be excavated they shall be marked with pin flags on either side of the line at maximum five-foot intervals.

5.0 Site Preparation and Hydrocarbon Remediation

5.1 The soils underlying any stained surface area (provide maps) shall be excavated to a depth sufficient to achieve a VOC concentration of <100 ppm within the underlying soils as measured in accordance with WEQP-18A. After excavation, a series of soil samples shall be collected 0-6" below the surface profile at 50' intervals (Same comment as before - Do you mean 50' X 50' grid? Map should depict typical/proposed sample points.) and field tested for VOC's. The geocoordinate position of each such sample shall be defined within a field log to include the sample depth and field VOC results. If field testing reveals VOC concentrations in excess of 100 ppm, the area will be further excavated and resampled until field VOCs are less than 100 ppm. ~~acceptable concentrations are achieved~~. The base of the excavation must also be tested for the constituents specified below in the lab.

WEQP-18 refers to QP-19 for BTEX. OCD does not have a copy of either QP-18A or QP-19.

The side-walls of any excavation exceeding a depth >3' bgs shall be field tested for VOC's at maximum 10' intervals (is this measured along the perimeter?). Ten percent of all field-tested samples shall be forwarded to Cardinal Laboratories and analyzed for the presence and concentrations of BTEX in accordance with EPA Method 8021B or 8260B. Acceptable concentrations shall be defined as <50 mg/kg BTEX ~~and <10 mg/kg~~ < 0.2 mg/kg benzene.

- Need to specify a sampling grid depicted on a map.
- May use PID for VOCs delineated to <100 ppm.
- Must collect 10% verification samples.
- Delineation and cleanup standards as follows:

VOCs (field)	100 ppm

Benzene (8021B or 8260B)	0.2 mg/kg
Total BTEX (8021B or 8260B)	50 mg/kg
GRO + DRO (8015M)	500 mg/kg
TPH (418.1)	2500 mg/kg
Chlorides (lab - 300.1, 300.0, or SM 4500B)	500 mg/kg

[NMSWDCo. must re-vegetate the site by establishing a vegetative cover equal to 70 percent of the native perennial vegetative cover (un-impacted by overgrazing, fire or other intrusion damaging to native vegetation) or scientifically documented ecological description consisting of at least three native plant species, including at least one grass, but not including noxious weeds, and must maintain that cover through two successive growing seasons.]

5.3 The excavated, oil contaminated soils will be stockpiled within the affected area and will be treated by aeration, organic loading and/or microbial inoculation using Environoc 101. A soil fertility test will be run on a composite sample of the oil contaminated stockpile by the Texas A&M Agricultural Research Center. The composition and volumes of fertilizers will be determined by the laboratory findings. The stockpile will be mixed and blended with a minimum of 200 cubic yards of fresh topsoil, organics and other amendments such Environoc 101 as required to achieve a field TPH concentration of <100 ppm, DRO/GRO value of <500 mg/kg as measured by EPA Method 8015M and a BTEX value of <50 mg/kg as measured by EPA Method 8021B or 8260B with benzene concentrations not to exceed 0.2 mg/kg ~~10 ppm~~. ~~A minimum twenty point composite confirmation sample will be collected in accordance with WEQP 77 and sent to Cardinal Laboratories for confirmation of TPH and BTEX concentrations.~~

Need to use field TPH and VOC measurement to determine if approaching cleanup standards. Then submit 5 point composite sample for every 20 cubic yards with 10% confirmation samples by lab. As discussed, OCD will not permit "blending" of clean soil with contaminated soil so as to appear that contaminate concentrations are being reduced. NMSWDCo must justify the proposed blending program. Hydrocarbon contaminated soils will bioremediate at TPH concentrations of <50,000 mg/kg, so what is the purpose of the topsoil? For good reason, OCD may allow the addition of topsoil, but will not allow NMSWDCo to specify that a "minimum of 200 cubic yards of fresh topsoil." OCD will allow a maximum amount, but no more than 5% of the total stockpile volume.

5.4 Upon laboratory confirmation that acceptable TPH and BTEX concentrations have been achieved, the previously oil contaminated soils will be spread over the excavated areas to replicate background contours. The stockpile will be tested on a daily basis for TPH (<2500 mg/kg), BTEX (<50 mg/kg) and benzene (<0.2 mg/kg) using QP-18A and QP-19 (provide copies of QP-18A and QP-19). Can these methods achieve the required detection limits? You must

also run lab confirmation samples before putting soil back into the excavated area ~~until acceptable concentrations are achieved.~~

6.0 Produced Water Remediation – Ion Exchange Treatment Area - Proof of Concept

6.1 The entire original affected area (what about the HC remediated soil? - it may be a larger area after treatment and spreading) shall be re-surveyed using the Geonics EM-38. Survey areas indicating a conductivity >350 mmhos/m shall be bermed with soils obtained from the areas immediately adjacent but outside the highly affected zone to a minimum height of 6" above ground surface.

A separate test plot measuring approximately 50' X 50' shall be situated immediately adjacent to the East Source Well (show location on a map - include proposed borehole locations) and shall be contained within 6" berms constructed from the adjacent topsoils. Prior to treatment, the test plot will be sampled in one foot depth intervals to a total depth of 4' below ground surface at five discreet locations. One test bore will be situated in the approximate center of the plot. The remaining four bores will be situated midway between the center and each corner of the plot. Composite samples from each one foot horizon will be forwarded to Cardinal Laboratories and analyzed for sodium adsorption ratios in accordance with WEQP-14, cation exchange capacities in accordance with WEQP-16, exchangeable sodium percentages in accordance with WEQP-15 and electrical conductivity in accordance with WEQP-12, WEQP-13 and WEQP-98. Sample collection shall be in accordance with WEQP-77.

Zero to four foot composite samples will be analyzed for the presence and concentrations of chlorides in accordance with EPA Method 300.0, 300.1 or SM 4500B, BTEX in accordance with EPA Method 8021B or 8260B, and TPH in accordance with EPA Method 8015M, GRO/DRO by 8015B.

6.2 The test plot will be treated with an ion exchange medium consisting of approximately sixty gallons of Desalt Plus and approximately 7,000 gallons of water. The treatment fluids will be topically applied at the rate of one inch per treatment interval.

6.3 The plot will be re-sampled (how frequently?) in locations as close as possible to the initial sampling points. Each 1' horizon shall be composited and analyzed for **electrical conductivity. (What about SAR, CEC, & ESP specified in Section 6.1?)The soil horizon test shall be calculated on the basis that the first foot of depth shall represent 43% of the total, the second foot: 21%, the third: 10% and the fourth 6%. Acceptance criteria to be an average soil profile EC of <4 mmhos/cm and chlorides <500 mg/kg.**

7.0 Produced Water Remediation – Main Ion Exchange Treatment Area

7.1 The remaining highly impacted area encompassing approximately 38,000 sq. ft. shall be treated with an ion exchange medium consisting of approximately eight hundred forty gallons of Desalt Plus and approximately 110,000 gallons of water. The treatment fluids will be topically applied at the rate of one inch per treatment interval.

7.2 After final treatment, the entire highly impacted area will be flushed with approximately 180,000 gallons of fresh water. The area will be re-tested in accordance with paragraph 6.3 of this protocol.

How frequently will the site be re-tested?

7.3 Composite soil samples will be obtained in maximum 50' grid points within the treated area to a maximum depth of 4' below ground surface and tested for sodium adsorption ratios **(What about SAR, CEC, & ESP specified in Section 6.1 plus chlorides?)**. Based on the laboratory results, some areas may be re-treated as necessary.

8.0 Produced Water Remediation – Organic Loading

Immediately after the successful ion exchange treatment, the entire affected area of approximately 1.6 acres shall be chisel plowed and evenly mixed with approximately 32,000 lbs. of shredded alfalfa hay to a minimum depth of 6" below ground surface. The area will be left with minor (not to exceed 6") furrows to promote seed germination.

9.0 Site Restoration

Prior to beginning the remediation phase of the project, we will consult with the NMSLO and other agencies as appropriate to determine final contouring and the make-up of a seed mixture designed to provide habitat for the Lesser Prairie Chicken. A temporary fence may be established outside the treatment area to prevent grazing until the new plants are established.

[NMSWDCo. must re-vegetate the site by establishing a vegetative cover equal to 70 percent of the native perennial vegetative cover (un-impacted by overgrazing, fire or other intrusion damaging to native vegetation) or scientifically documented ecological description consisting of at least three native plant species, including at least one grass, but not including noxious weeds, and must maintain that cover through two successive growing seasons.

NMSWDCo must conduct post-treatment monitoring at the site to demonstrate that the proposed remedy has successfully re-established a vegetative cover acceptable to the SLO.

NMSWDCo must propose a post-treatment monitoring program to ensure that the sodium is being pushed down.

NMSWDCo must propose a post-treatment maintenance program to ensure that the new vegetation is growing]

10.0 Cretaceous Monitor Well

A new monitor well will be advanced to a minimum depth of 130' below ground surface in hopes of locating a Cretaceous water source. The well will be situated immediately adjacent to the existing South Monitor Well and will be designed to have a minimum of 10' of screen above and below the static water level. Due to the presence of the NMOCD described "perched" table situated at a depth of approximately 40-50' below ground surface, it may be necessary to advance the well in two stages to screen off any waters from within the upper zone.

(From email of 6/24/2011: *The monitor well construction will be initially drilled to a maximum depth of 70' and cased to surface using 8" PVC. The bottom 10-15' of the bore will be cemented on the inside & outside of the casing and the outside grouted to surface. We will then drill through the inner cement segment to a depth sufficient to advance the bore through at least 10' of water table. A slotted 4" casing will extent a minimum depth of 10' into the water table and 10' above. The outside of the 4" casing will be grouted to the surface.)*

Provide a proposed well diagram.

11.0 Water Well Monitoring

~~**10.1**~~ 11.1 The site presently has three monitor wells advanced into the "perched" table. They are described as the Northwest Delineation Well, the South Delineation Well and the East Source well. (use well numbers) We propose to advance another well immediately adjacent to the existing South Delineation Well into the potential Cretaceous zone as described in 9.0 of this protocol. (depict on map) The three "perched" wells will be sampled quarterly. The sampling report will provide the depth to groundwater, recharge rate and chloride concentrations. We will continue to bail and sample all such wells until they are found to be dry.

~~**10.2**~~ **11.2** If water is encountered within the proposed Cretaceous Delineation Well, it will be initially sampled for the presence and concentrations of chlorides, TDS, BTEX, cations and anions. (bromide?) It will thereafter be sampled on a quarterly basis for the presence and concentrations of any criteria contaminant initially found to exceed NMWQCC standards but as a minimum chlorides and BTEX will be tested. Testing shall be in accordance with WEQP-76.

OCD is deferring a final decision on the status of the ground water at this site until after we review the results of the new well.

12.0 Remediation Report

At the conclusion of the project, Whole Earth shall prepare a closure report that contains the following minimum information:

- Photographs of the location prior to remediation activities

- Photographs of the site at the point of maximum excavation
- Photographs of the site at time of final contouring
- Remediation process photographs of major events
- A copy of this protocol
- Laboratory analytical reports for the soils underlying the excavated areas
- Laboratory analytical reports for the oil contaminated soils as re-deposited within the excavation
- Laboratory analytical reports of the final surface remediation
- Laboratory analytical reports of all monitor well fluids
- Bailing reports of each testing event
- Drilling log of the Cretaceous Delineation Well
- Copies of all field testing protocols
- Copy of the MSDS of Desalt Plus
- Copies of the information contained on the seed bags
- Well completion diagrams
- Maps of site depicting stained surface area, stockpile area, treatment area, sampling grid, etc.
- Maps depicting field VOCs, benzene, BTEX
- Cross-sections