

R. T. HICKS CONSULTANTS, LTD.

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Artesia ▲ Carlsbad ▲ Durango ▲ Midland

August 19, 2016

Ms. Henryetta Price
Environmental Protection Specialist
BLM Carlsbad Field Office
Carlsbad, NM
Via E-mail

RE: Marker Oil KK Battery "Legacy" Crude Release

Dear Ms. Price:

R.T. Hicks Consultants is pleased to submit this surface reclamation plan for the "legacy release" that originated from a Navajo Refining Company pipeline adjacent to the Marker Oil KK Battery. This is a voluntary effort on the part of Marker Oil.

The crude release is relatively square and bounded by the abandoned Navajo gathering line as shown in the image below (red outline). The characteristics of the release are:

Latitude	32 51 43.21
Longitude	-103 57 26.03
East-west dimension	50 feet
North-South dimension	41 feet
Maximum crude thickness	10 inches
Chloride concentration beneath crude	425 ppm by field titration (one sample)



We propose phytoremediation¹ of the residual crude, following the plan outlined below.

1. Use a backhoe to disaggregate the crude/asphaltine by removing the 1-10 inch thick layer plus 3-6 inches of underlying sand to a pile located west of the crude footprint. This pile should be less than (50 x 41 x 1.25 =) 2,562 cubic feet or 95 cubic yards.
2. Remove clean soil from beneath the crude footprint to a separate pile to create a level surface that is about 2-feet below the natural grade.
3. Use soil from the pile without entrained crude to create berms on all downhill sides of the former crude footprint area (on the western side). The former spill footprint is now a "phytoremediation cell" that will hold precipitation and allow infiltration without run-off.
4. Place the disaggregated crude and sand into the phytoremediation cell to a uniform thickness. The crude should contain chunks that are less than 2-inches in diameter.
5. Place about 12-inches of the "clean soil" from the pile over the disaggregated crude layer.
6. Furrow the surface and seed it with the appropriate BLM seed mix.

During the short term (1-2 years), precipitation will fall on the level surface and infiltrate. The seed mix will grow and roots will extend into the disaggregated crude layer. Over the long term of 2-7 years, microorganisms in the root zone will degrade the crude and wind action will remove the berms and return the area to a more natural state.

Upon your approval, Marker Oil will implement the remedy and notify BLM prior to seeding the site.

As this is a surface remedy of a historic release site, it is our understanding that notification of OCD is not required. We have copied OCD as a courtesy. Please contact me if you have any questions concerning this proposed action

Sincerely,
R.T. Hicks Consultants

A handwritten signature in black ink, appearing to read "Randall Hicks", written in a cursive style.

Randall Hicks
Principal

Copy: Marker Oil
OCD District 2

¹ See <https://en.wikipedia.org/wiki/Phytoremediation>