STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING APPLICATION OF GANDY MARLEY, INC., TO MODIFY THEIR EXISTING NMOCD RULE 711 PERMIT

CASE NO. 13480

COMMENTS BY THE NEW MEXICO CITIZENS FOR CLEAN AIR & WATER, INC., REGARDING PERMIT CONDITIONS PROPOSED BY NMOCD.

CERTIFICATE OF NOTICE

The undersigned certifies that on June 21, 2005, the undersigned served a copy of this notice on the following persons by facsimile:

Applicant	Gandy Marley, Inc.
Attorney	Pete V. Domenici, Jr. Domenici Law Firm, P.C. by fax to 505-884-3424
Respondent	New Mexico Oil Conservation Division
Attorney	Gail MacQuesten by fax to 505-476-3462
Opponent	Controlled Recovery, Inc.
Attorney	Michael H. Feldewert Holland & Hart, LLP by fax to 505-983-6043

Under cover letter dated June 14, 2005, Mr. Ed Martin of OCD distributed a set of proposed permit conditions. This document provides the response of NMCCA&W to those proposed conditions. We suggest alternative permit conditions, and provide our reasoning behind those suggestions.

1. Above-ground sequestration of wastes.

OCD's proposed permit conditions would approve the applicant's original intent to sequester wastes at depths from 20 ft below original grade to 10 ft above original grade. In the absence of exemption from RCRA, these wastes would be classified as hazardous. The above-grade sequestration will result in a proposed 3:1 slope of the closed "landfill," which will actually be a covered above-ground repository. The proposed permit says that "post-closure monitoring for the landfill portion of the facility will be necessary for 40 years after closure of the site." This wording does not specify what parameters will be monitored, what specifications must be maintained, or whether full financial assurance will be retained for the 40-year interval. Testimony provided no demonstrated experience to assure that the proposed sloped cover will not erode in time, exposing the wastes. Likewise, there is no demonstrated experience to assure that solid bodies or nonuniformities in the wastes will not settle in time, causing local surface depressions that effectively break the cap and allow infiltration of water. Furthermore, there is no demonstrated experience that rodents will not penetrate the cover, thereby also allowing infiltration of water. During the hearing, the undersigned witness testified of having observed

each of these failure conditions in landfills that had been closed for less than 40 years. The proposed landfill may provide a design for which other many operators will seek similar permits. This and any similar landfill will generate a permanent legacy for society, a disposal unit that will remain long after the grandchildren of current children have passed away. It is therefore important to assure that the wastes will remain in place.

We therefore suggest the following permit conditions. The top of the sequestered wastes should be at an elevation at least 3 feet below the original ground surface. The cap should be gradually contoured to encourage runoff, but not to direct runoff from adjacent disposal units into a potential erosion channel lying between units. The cap should be seeded with native species. The financial assurance should be retained until security of the cap and the successful propagation of vegetation have been monitored for 40 years, without deliberate reseeding, maintenance of vegetation, or repair of the cap. If the landfill demonstrates stability for 40 years without human intervention, then the financial assurance can be released. If any repair, reseeding, or maintenance is required, the 40-year demonstration interval begins again.

2. The clay liner.

One purpose of the clay liner is to discourage infiltration of contaminated leachate from the wastes into the ground, especially while the landfill is open. The liner should not be regarded as an impermeable membrane. If the liner were saturated, but with no ponding of water, the liner would seep water at approximately 3 cm per year--which is sufficient to push saturation through approximately 10 cm of earth of 30% porosity each year. A purpose of the liner is to retain precipitation in open pit until the water evaporates. Flow through porous media usually occurs through preferential channels. Therefore, if water is to be retained by the liner, the liner must be very uniform. To illustrate the effect of a small nonuniformity in the liner, we note that a single tube of 0.25 mm (10 mil) diameter extending through the liner would transmit as much water as the seepage of one entire square meter of the proposed liner. In other words, even one 10-mil channel in each square meter of the liner would double the seepage. The proposed permit conditions specify only that "Quality control measures, consistent with industry standards, will be employed to ensure the uniform construction of the clay liner." This non-specific language assures only that the liner will be constructed by the same means as other liners have previously been constructed. It does not provide any verification of liner integrity. We suggest that the liner be subjected to infiltration tests comprising at least 1% of the liner area, with each test involving at least 100 square feet of liner within the infiltrometer.

The drawings of a typical cell show no liner at or above the 20 ft bench. We suggest that this area be lined prior to installation of any wastes above it.

3. The clay cap.

The proposed design includes a cap composed of a 1-ft clay layer beneath a 2-ft layer of soil. Except for the steep slope imposed by above-ground burial, this minimal cap might be adequate. The purpose of the clay layer is to retard infiltration until any absorbed precipitation can be returned to the atmosphere by evapotranspiration. By preventing moisture in the waste region, the clay layer in effect reduces upward migration of salt. The success of this scheme also requires that water not enter the wastes by penetrations in the liner, such as rodent holes and washed-out depressions. The successful retention of salt within the closed landfill requires that water be kept out of the landfill, for centuries. The proposed 3:1 slope of the cap is very likely to induce erosion that penetrates the cap somewhere, thereby negating the purpose of the clay layer.

4. Vadose zone monitoring of the landfill.

The OCD proposal would require monitoring of the vadose zone beneath the landfill by means of two boreholes, each screened from 20 ft below original grade to 40 ft below original grade. The presence of any fluids in the boreholes would be monitored quarterly.

We suggest the proposed monitoring with boreholes would be ineffective. A depth of water would exist in a borehole only if the ground were saturated at some level by a confining layer, and if the borehole itself did not serve as a conduit to disperse the water at a lower level. The most likely situation is that water will pond in the bottom of the landfill, seep out at a preferential location, and move downward via a preferential pathway, never saturating the location of either borehole.

Figure 1 is a diagram of a monitoring scheme that we believe would be lower in cost and more effective than the boreholes. At intervals of approximately 50 ft, a perforated pipe lies on the bottom of the landfill, or better, at the top of the clay liner. This monitoring system will be more effective if the upper surface of the liner has a slight slope, as shown. The upper end of the nearly horizontal perforated PVC pipe is capped. The lower end terminates in a small sump and a riser that extends a few feet above the cap of the closed landfill. Water gathering at the bottom of the landfill would easily be detected by a probe or by a resistance detector lowered to the sump. If the landfill is 20 ft deep or less, water might be extracted with a suction pump on a tube lowered into the riser. For the proposed depth of landfill, a submersible pump might be needed.

5. Monitoring of the landfarm.

The proposed permit would require sampling of the soil at a depth not exceeding three feet, with analysis of the samples quarterly for hydrocarbons and annually for cations and metals. As brought out in our testimony, this same sampling protocol was required previously, but not enforced and therefore ignored. Sampling for contaminant migration at three feet below a landfarm is somewhat analogous to looking for your horse in the next county in order to detect whether your barn door is open. By the time contaminants reach a depth of three feet, migration has probably occurred for years and so much soil is contaminated as to defy cost-effective remediation. We suggest a protocol that would be less costly and more effective.

If contaminants are migrating, they will be detected best at a shallow depth. We suggest sampling at six inches beneath the depth of farmed wastes. Semiannual sampling for hydrocarbons and annual sampling for metals and cations would probably be sufficient, and would cost less than the proposed protocol. We strongly suggest that the monitoring include explicit reporting and tracking of the sodium absorption ratio (SAR), even if new wastes are supposedly salt-free. The data that comprise the SAR exist within the proposed monitoring; therefore reporting SAR should cause no additional cost.

Respectfully submitted,
for NMCCA&W, Inc.

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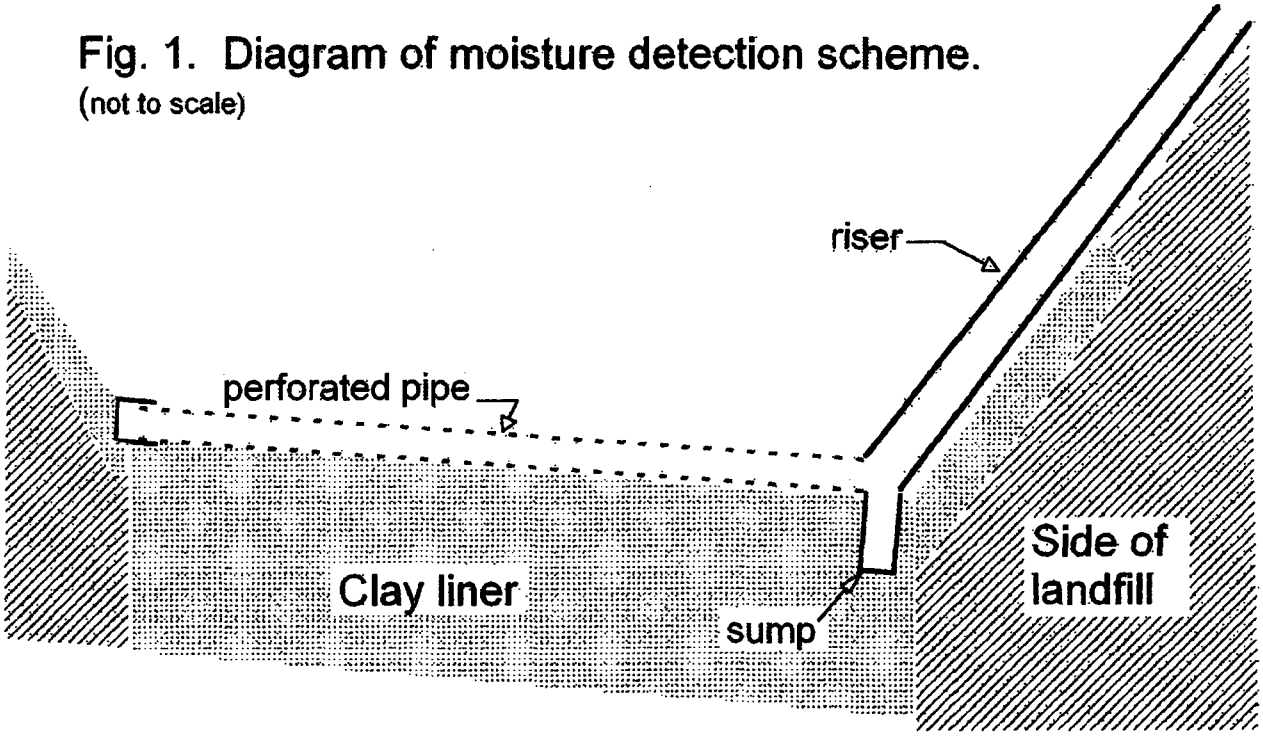
Fig. 1. Diagram of moisture detection scheme.

(not to scale)



Perforated pipe may be laid within the operations layer or on the clay liner.
Perforated pipe may be laid on a plastic sheet or fiberglass mat to prevent movement of clay into perforations, and may be covered with fiberglass mat to prevent movement of soil from the operations layer into perforations. The layer of operations soil is not shown.