STATE OF NEW MEXICO
ENERGY, MINERALS AND NATGURAL RESOURCES DEPARTMENT
OIL CONSERVATION COMMISSION

APPLICATION OF THE NEW MEXICO OIL AND GAS ASSOCIATION AND APPLICATION OF THE INDEPENDENT PETROLEUM ASSOCIATION FOR THE AMENMENT OF CERTAIN PROVISIONS OF TITLE 19, CHAPTER 15 OF THE NEW MEXICO ADMINISTRATIVE CODE CONCERNING PITS, CLOSED-LOOP SYSTEMS, BELOW-GRADE TANKS, AND SUMPS AND OTHER ALTERNATIVE METHODS RELATED TO THE FOREGOING MATTERS, STATEWIDE.

CASE NO: 14784
CASE NO. 14785
COMBINED

FINDINGS OF
THE NEW MEXICO CITIZENS FOR CLEAN AIR & WATER

Pursuant to the Commission's instructions, the New Mexico Citizens for Clean Air & Water ("NMCCAW") hereby submits its Findings to the Oil Conservation Commission ("Commission") based upon evidence presented in the hearing. Citations are to the NMOGA application, including its second set of modifications, unless otherwise noted.

I. CLARIFICATION OF THE PURPOSE AND IMPACT OF RULE 17

Finding 1: The purpose of the rule is to protect the environment but the proposed amendments fail to provide adequate environmental and human health protection.

The Oil and Gas Act, NMSA 1978, §70-2-12.B(21) authorizes the Oil Conservation Division to regulate the disposition of nondomestic waste to protect public health and the environment. The stated objective of the current rule 19.15.17 NMAC, adopted in 2008 after approximately 17 days of hearing and testimony from numerous experts, is "To regulate pits, ... for the protection of public health, welfare, and the environment." This objective is consistent with maintaining the exemption from the federal RCRA which would be more demanding than state regulation. The objective remains unchanged; however, the

amendments proposed by NMOGA and IPANM diminish the protections provided by the current rule. The proponents carry the burden of demonstrating that their proposed amendments will meet the objective of the rule and, as evidenced by their own testimony, the proponents failed to carry that burden in this case. As discussed below, the proposed standards allow for soil contamination that will not adequately prevent present and future harm.

The proponents did not propose monitoring or any other measure to ensure that their proposed standards would be protective of the environment. Moreover, NMOGA stated that its proposed amendments were based on a "risk-based analysis"; however it provided no evidence that it had actually conducted a risk analysis for any of its proposed changes to the rule. [Tr. p.59 L.16; p.625 L.11-16, p.705 L.8-16, p.1131 L.8-22.] Dr. Thomas was qualified as a pathologist but did not provide testimony on the pathology and pathways for transport of the contaminants, particularly as they affect local biota. [Tr. p.443-510] Referring to the proposed tables of soil and burial standards, Dr. Thomas said the criteria are what the industry said "we can live with." Dr Thomas said he wasn't able to get good answers from either the industry or the OCD regarding pathways or exposure. [Tr. p. 465 L.6-8; p.465 L.23-p.466 L.1]

Mr. Arthur was accepted as an expert in several disciplines, including hydrogeology and contaminant transport. [Tr. p.514 L.9-p.515 L.9] However, in response to questions, he could not provide any technical reasons for setbacks from ground water, or a watercourse, but presented a discussion of unrelated experiences. [Tr. p.725 L.13-p.734 L.22]

Questioning and statements during the hearing confused protection of the environment with protection of correlative rights and preventing waste of the petroleum resource. [Tr. p.375 L.17-p.376 L.14, p.1318 L.1-7, p.1684 L.4-6, p.1779 L.5-14.] An OCD district supervisor was not certain that OCD is required by statute to protect the environment. [Tr. p.1940 L.24-p.1941 L.13]

Finding 2: Protection of environment must include protection of both surface and ground water, soils, and plant life.

The current rule provides several different methods to protect ground water including siting, design and construction, and operational requirements. The proposed amendments weaken these

requirements and thereby threaten ground water, surface water, the land surface, and the subsurface unsaturated moisture that supports soil biota and plant life, which in turn support animals and people. The proponents provided no technical testimony addressing the movement of chemicals or excavated earth to surface water. Furthermore, the proposed closure criteria for soils beneath below-grade tanks and pits are expressed in terms of depth to ground water, without regard to effects at ground surface. [proposed 19.15.17.13 Table I] In contrast, New Mexico Citizens for Clean Air and Water (NMCCA&W) provided testimony from Dr. Neeper that addressed quantitative thresholds for chloride damage to plants, data originally published by the Agricultural Research Service and by the Integrated Petroleum Economic Consortium of the University of Tulsa. [NMCCA&W Ex. 5, pp. 21, 22, 27]; [Tr. p.1143 L.8-p.1145 L.4] [*Note: the transcript mistranslates the spoken electrical conductivity unit "millimhos," as the chemical unit, "millimoles."*] The proponents also failed to provide quantitative testimony supporting its proposed soil closure criteria, which apply during closure of below-grade tanks or pits. These contaminated soils may occur at ground surface or any depth, unlike waste burials which the proposed amendments would restrict to depths greater than four feet.

The proposed closure criteria for buried wastes are expressed only in terms of depth to ground water. [proposed 19.15.17.13 Table I] Translation of the chloride leach-test specifications to equivalent mass fraction of soil indicates the salt content would be so high no plant roots could survive in the buried wastes. [Tr. p.1204 L.12-14]

We therefore conclude that the proposed numerical criteria for soils and waste burial were presumed without proof to protect ground water, while also being without supporting quantitative analysis of the effects at ground surface. Therefore, proponents failed to demonstrate that their proposed amendments are protective of the environment.

II. SECURITY OF PIT OR TRENCH BURIAL

Finding 3: Field investigations described by NMOGA's witnesses did not demonstrate that contaminant movement is confined to certain limits, upward or downward.

In support of allowing burial of drilling and workover wastes, the proponents argued that wastes buried under four feet of soil

cover will not be transported to ground surface or to ground water. [Transcript p.73 L.13-18; p.136 L.5-8; p.592 L.19-p.594 L.3, p.1376 L.2-10]

This assertion was contradicted by investigations of burials in a variety of situations of soil and precipitation that exist within New Mexico. Dr. Buchanan reported investigation of a Conoco-Phillips pit at which the upper edge of salts was 8 inches below ground surface and the lower edge was at a 10-foot depth. [NMOGA Ex. 17-19] Dr. Buchanan acknowledged that salts below that pit moved to a depth of ten feet but stated that salts did not migrate farther because the water did not go deeper. [Tr. p.821 L.22-p.822 L.5] Dr. Buchanan provided no measurement of soil moisture. He did not provide proof that the water and salts stop moving downward during future decades. In fact, Dr Buchanan testified that roots follow water, and he has seen roots at a depth of 15 feet, thereby indicating water can move to at least that depth [Tr. p.822 L.15-25]. Dr. Buchanan testified that salt will continue to move downward out of the pit, that he is uncomfortable as to how far pit contents will move, and that he has spent very little time looking below pit contents. [Tr. p.928 L.22-p.929 L.13]

Dr. Neeper presented soil sampling at two pits near Caprock New Mexico, with pit ages of 11 and 31 years post-closure, finding chloride extending from ground surface to a depth greater than the limit of his drilling at 15 feet below ground surface. [Tr. p.1158 L.5-p.1164 L.1; NMCCA&W Ex. 5 pp. 34-35] Photographs show that the surfaces of these pits were almost lifeless [NMCCA&W Ex. 5 p.33]. Dr. Neeper illustrated recent subsidence above one pit {NMCCA&W Ex. R2 pp.3-4], which concentrates the precipitation into a penetrating channel. Dr Neeper also showed data from sampling at two pits near Loco Hills, ages 6 and 31 years post-closure, where the leading edges of the chloride plumes were approximately 30 feet below ground surface. [Tr. p.1166 L.1-22; NMCCA&W Ex. 5 p.39].

The field measurements reported by Buchanan and Neeper document the contaminant positions at the indicated time after pit closure, with the vegetation, rainfall, and soil conditions that are unique to each situation. They do not establish that chloride transport remains within certain bounds for all time. Therefore, NMOGA failed to demonstrate that its closure requirements will be protective of groundwater and the environment.

Finding 4: Pit contents are not retained indefinitely by a liner or by drilling mud.

Although he provided no evidence to support his statements, Dr. Thomas testified that the settled clay in the bottom of a pit would create a seal to prevent downward migration of wastes. [Tr. p.468 L.17-P.469 L.2] However, various sub-sections of the proposed rule [e.g. 19.15.17.13B(5)] and testimony by Mr. Gantner [Tr. P.71 L.21-23] indicate the wastes will be stabilized by mixing with soil, a process that would disturb any mud seal in a pit and possibly tear the liner below the wastes. In the HELP model of IPANM's witness, Mr. Mullins, the infiltration depended upon an assumed intact liner, which retained an average liquid head of zero to 7 millimeters, depending on geographical location. NMCCA&W's rebuttal testimony offered a photo of a pit during stabilization by a track hoe, illustrating likely damage to the liner. [NMCCA&W Ex. R2 p.3]

The NMCCA&W field investigation of one lined and one unlined pit at Loco Hills demonstrates that neither the clay drilling mud nor a liner will reliably retain the contaminants. NMCCA&W Exhibit 5, page 39 shows measurements of chloride penetrating below a pit at Well 321. The pit was lined, with the liner closed on top. Dr. Neeper reported a salt cake under the liner at the top of that pit. [Tr. p.1167 L.8-p.1168 L.5] Dr. Neeper's field investigation documents upward contaminant movement to the impermeable cap on this particular pit. Salt moved downward below the pit despite the operator's attempt to bury the contents within a sealed liner.

Finding 5: Buried salts move into the root zones of plants.

NMOGA testified that buried salts move downward, and upward into the root zone. Dr. Buchanan stated that buried salts would never migrate to ground surface. [Tr. p.818 L.14-19] However, the red line of Dr. Buchanan's graph in NMOGA Ex. 17-19 shows that salt (measured by EC) is at half the current pit concentration at 12 inches below ground surface. This clearly demonstrates that salts can migrate into the root zone, which Dr. Buchanan says is the upper 24 inches of soil for grasses and down to four feet for shrubs and forbs. [Tr. p.822 L.22-p.823 L.4; p.794 L.13-20] Dr. Buchanan also testified that water moves deeper than four feet, particularly as indicated by roots at 10 and 15 feet. [Tr. p.821 L.21-p.822 L14] Therefore, burial under four feet of soil does not protect grasses, shrubs, or other species that may have deeper roots. The fact that the salt-tolerant species alkali

sacaton and four-wing saltbush may survive at EC of 12 or 16 [Tr. p.819 L.25-p.820 L.5] does not establish immunity of this species to sodium poisoning, or justify burial of wastes that will greatly exceed these EC values anywhere in the state.

Finding 6: Modeling provides understanding of the transport process, but not absolute predictions for all situations.

Using the HELP model and presuming an intact liner, Mr. Mullins derived infiltration rates in the approximate range 0.5 to 1.5 mm/year beneath lined pits, but he presented no estimate of infiltration without a liner. The model indicated that chloride would reach groundwater in 775 years at Carlsbad, and longer elsewhere. [Tr. p.2018 L.5-19] However, at two pits in Loco Hills, approximately 30 miles northwest of Carlsbad, the leading edge of chloride arrived 15 to 20 feet beneath the estimated bottoms of the pits in 6 and 31 years, respectively. [NMCCA&W Ex. 5 p.39] This field data casts doubt on the applicability of the steady state HELP-MULTIMED model. In such a steady-state model, the arrival time of the contaminants at an aquifer can be understood by the speed of the unsaturated flow. [NMCCA&W Ex. R2 p.2] In particular, increasing the presumed infiltration in such a model could bring the arrival time to less than a hundred years.

Mullins' model was incapable of representing any upward movement of contaminants. [Tr. p.1524 L.10-13] In contrast with Mullins' steady-state model, Dr. Neeper presented dynamic numerical simulations using measured histories of soil moisture at a vegetated site to drive whatever infiltration might occur. [NMCCA&W Ex.5 p.44] The simulations indicate preferential movement of contaminants downward in soil of high permeability, but slow downward transport in soil of low permeability. With high permeability, upward contaminant movement is slight, but with low permeability, the upward movement is pronounced. [NMCCA&W Ex.5 pp.45-47] Therefore, Mr. Mullins' model failed to represent the variety actual movement of contaminants toward ground water or toward the ground surface.

Dr. Neeper's dynamic simulations are consistent with the field studies that indicate contaminants will move out of a buried pit. How far, and how fast, the contaminants move depends on the local soils and depends markedly upon infiltration, which in turn depends on vegetation. If the surface once becomes contaminated with salts, a site may not vegetate, exacerbating

the transport. [Tr. p.1199 L.23-p.1200 L.8] Protection of the environment therefore requires that toxic minerals and compounds not be left on the soil surface or buried on site.

III. CHEMICAL CONCENTRATION LIMITS FOR CLOSURE

Finding 7: The hearing record contains no technical testimony to support the proposed numerical standard of Table I for soil chloride.

The proposed amendments would allow closure with 5,000, 10,000, or 20,000 mg/kg chloride in the soil beneath a pit or below-grade tank, depending on the depth to ground water. Dr. Neeper testified that the 20,000 mg/kg limit would be equivalent to replacing the normal pore water with brine. [Transcript P.1148 L.20-24] Thus, for any of the proposed standards, a leak of a pit or tank could allow gradual infiltration of very salty water into the soil without exceeding the proposed standard. The proposed closure standard requires no investigation of the depth of penetration of the chloride beneath a pit or tank. Therefore the proposed rule would allow seepage of contaminated water to any depth.

The chloride standards of Table I are particularly inadequate for a below-grade tank, which the proposed rule would allow to be sited only 10 feet above ground water. Field measurements show that chloride can move more than ten feet below a buried source in less than 30 years. [NMCCA&W Ex.5 p.39]

The chloride standards of Table I are absolutely inadequate for drying pads, which are located at ground surface. At a drying pad, the proposed standard would allow the operator to leave surface soils with 5,000 to 20,000 mg/kg chloride, permanently sterilizing the soil as illustrated on pages 25, 26, and 33 of NMCCA&W Exhibit 5. Surface sampling found no grass when the chloride was greater than 250 mg/kg. [NMCCA&W Ex.5, p.27] Therefore, NMOGA's standards could lead to dead soils and increased environmental harm, violating the objective of the rule.

In its comments dated January 4, 2012, the New Mexico Department of Game and Fish also opposed the proposed amendments of the chloride standards, citing the toxicity of sodium to wildlife and the inhibiting effects of soil contamination on plant growth.

Finding 8: The hearing transcript contains no technical testimony to support the numerical standard of Table II for chloride in buried wastes.

The proponents failed to provide evidence or data to support the burial standard of Table II as a leach test, while the closure standard of Table I is expressed as chloride per mass of dry soil. Expression of chloride standards variously as dry soil fraction and as a leach test obfuscates the rule. When the leach test standards are translated to chloride per kilogram of soil, the standards represent several percent salt by weight, depending on the presumed density of the dry soil. [NMCCA&W Ex.5 p.63] Page 17 of NMCCA&W Exhibit 5 shows that the pore moisture in soil with 1,000 mg/kg soil chloride (0.1% chloride) is fatally toxic to most plants. This prediction agrees with field tests in which no native vegetation, and almost no vegetation at all, grew above pits with chloride contamination at ground surface exceeding 400 mg/kg. [NMCCA&W Ex.5 p.27]

Finding 9: The transcript contains no technical testimony to justify the proposed numerical standard for benzene.

In Section 13 of the proposed rule, Tables I and II change the closure standard for benzene from the previous value of 0.2 mg/kg to 10 mg/kg. Although Dr. Thomas identified benzene as a compound of concern, the transcript contains no technical testimony to justify an increase of the soil and burial standards by a factor of 50. The standards apply to a composite sample acquired at a soil or waste surface exposed to air at a time when the sample is acquired. Other than an immediate fresh exposure, volatile compounds will usually have lower concentrations at the surface. NMOGA Exhibit 11-9 presents the tier 1 residential screening level as 10.3 mg/kg, a level implying site investigation is needed. Because benzene is soluble and is transported in the vapor phase, any standard as high as 10 mg/kg should be specified as the maximum of several subsurface samples.

Finding 10: The proposed rule ignores inorganic contaminants.

The proposed limits of chemical concentration proposed by NMOGA and IPANM apply only to chloride and the volatile petroleum hydrocarbons shown in Table I and Table II of the proposed Section 13. In particular, the proposed rule deletes all reference to inorganic contaminants specified in Subsection A of

20.6.2.3103 NMAC. Of the inorganic contaminants, NMOGA's technical testimony directly addressed only arsenic and barium, with the observations that the arsenic doesn't mobilize in the environment and barium sulfate is not soluble. [Tr. p.456 L.19-P.457 L.20] The specified TCLP leach test discussed by Dr. Thomas is designed to identify mobile contaminants. Therefore, if the arsenic and barium are immobile, they would not appear in the results of the tests. Yet, in the averaged measurements at gas-well pits cited by Dr. Thomas, both barium and arsenic exceeded the residential screening levels. [NMOGA Ex. 11-7; 11-8] Sodium is toxic to plants and may greatly exceed the numerical concentration of chloride in the wastes. [Tr. p.1136 L.4-24; NMCCA&W Ex.5 p.1] Thus, to be protective of the environment and human health, burial or abandonment of inorganic contaminants other than chloride should also be restricted by the rule.

IV. MULTI-WELL FLUID MANAGEMENT PITS

Finding 11: The proposed Paragraph 19.15.17.11J requires no secondary liner for multi-well fluid management pits, and only an unspecified leak detection system.

Although NMOGA's expert initially stated that multi-well fluid management pits would be required to have a double liner, the statement was retracted [Tr. p.246 L.21-p.247 L.1], and the absence of a required double-liner was later confirmed. [Tr. p.287 L.12-25] Unlike permanent pits, which require either 30- or 60-mil liner material with a specified maximum hydraulic conductivity for both liners, the multi-well pits require only a 20-mil liner with no specified conductivity. Like permanent pits, multi-well fluid management pits may be in use for years, serving as storage for produced water. [Tr. p.245 L.3-p.246 L.19] A multi-well fluid management pit may serve many of the purposes of a permanent pit, and should therefore be subject to the same siting and construction requirements as a permanent pit.

Neither NMOGA or IPANM provided technical testimony documenting proper operation of a multi-well fluid management pit without a secondary liner. Based on the evidence presented, it is reasonable to expect that a multi-well fluid management pit with a single liner will allow 10% to 40% of its inventory to pass into the soil annually. At permanent pits, the specified hydraulic conductivity of the primary liner would allow annual transmission of 21% to 41% of the stored liquid depth. [NMCCA&W

Ex.5 p.54] This estimate compares well with Mr. Mullins' HELP model, which predicted the liner transmitted 20% of the annual average head at low heads. [IPANM Ex. 7; NMCCA&W Ex.R2 p.6; Tr. p.2053 L.4-13] [*Note: The vertical axis on Ex. R2 p.6 should be labeled as millimeters, not inches.*] Thus, the HELP model recognizes that liners seep or leak a significant fraction of the retained head each year.

The proposed rule requires no action if a leak is detected. Page 34 of IPANM Exhibit 10 indicates that 80% of installed liners have 1 to 10 defects per acre. A liquid leak is therefore likely to be isolated in location, releasing a local stream of fluid for years. This would require a secondary liner for collection and detection. Furthermore, safety would require a secondary liner in the event of a failure in a primary liner.

V. SITING AND SETBACK STANDARDS

Finding 12: The proposed vertical setbacks as applying only to "unconfined" ground water are unenforceable and do not protect the environment.

The proposed rule requires no separation of pits, below-grade tanks, or waste burials from ground water, so long as the ground water is "confined." This proposal creates a false distinction in an attempt to reduce environmental protection for ground water. The condition "confined" or "unconfined" as applied to ground water is unenforceable because confinement of an aquifer may be impermanent, is difficult to measure at low head, and may be physically difficult to distinguish in situations of semi-confined aquifers, barometric effects, or earth tides. [Tr. p.1223 L.5-11] [*Note: the transcript erroneously reports the words "tide" and "tidal" as "dyke" and "diagonal."*]

The limitation of vertical setbacks only to unconfined aquifers presumes that confined ground water is immune to contamination. The proponents provided no technical testimony to document the presumption that a confined aquifer is immune to contamination from wastes or releases located above or within the confining layer, therefore requiring no setback. Mr. Arthur testified that a transition from confined to unconfined condition would not matter at 100 years in the future. [Tr. p.537 L.3-5] However, he provided no reason why an unconfined aquifer should require separation from buried wastes, while a confined aquifer that became unconfined would require no such separation.

The terms, "confined" or "unconfined" appear in Sections 7D, 7R, 10A(1)-(4), 10C(1), 11F(11), and Tables I and II of Section 13; and also appear uniquely in IPANM Sections 12B(5) 12B(6), and 12B(8). In addition to failing to explain why the OCD should distinguish between confined and unconfined aquifers, the proponents failed to explain clearly how one would determine whether an aquifer is confined. [Tr. p.1204 L.15-p.1205 L.1206 L.20] The Oil Conservation Commission should not incorporate this unsupportable distinction in a rule.

Finding 13: The transcript contains no technical testimony to demonstrate that the numerical values of the horizontal and vertical separations of pits and tanks from water provide adequate protection.

The proposed amendments greatly reduce the horizontal setbacks of pits from a watercourse, water supply, or wetland. [Proposed 19.15.17.10A NMAC] The hearing transcript contains no technical testimony to indicate that the reduced setbacks provide chemical protection to water or physical protection to arroyos. The proposed rule would reduce the separation between a below-grade tank and ground water from 50 feet to 10 feet, increasing the chance that a slow leak from a below-grade tank will reach water. Of particular concern, the proposed 19.15.17 11I NMAC would grandfather single-wall tanks without visible side walls, which would prevent observers from seeing whether there are leaks or adequate tank integrity below grade. The current rule allows for single-wall tanks below grade as long as the tank's side walls are visible for inspection. [19.15.1.7.11.I (4) NMAC] This is a common sense approach that allows for rapid response to leaks and other problems with tank systems, thereby providing greater environmental protection. The proponents failed to explain or justify why this level of environmental protection should be eliminated.

Finding 14: In practice, the proposed rule would allow waste burial with little restriction of geographical location.

According to the proposed rule, routine burial can occur anywhere, so long as the ground water is more than 25 feet below the burial and the wastes do not exceed the limits of Table II. Sub-paragraph 10C(2)of the proposed rule would allow burial of wastes in a floodplain, and burial with no setback from a watercourse, building, water well, spring, or wetland, unless

the concentrations exceed the limits of the Section 13 Table II. Most stabilized drilling wastes will not exceed the chloride limits of Table II. [Tr. p.1202 L.17-p.1203 L 10] Averaged data from pits do not exceed the proposed benzene standard. [NMOGA Ex. 11-9] This means that routine burial can occur anywhere, so long as the ground water is more than 25 feet below the burial. The proponents provided no testimony to support the elimination of almost all horizontal setbacks for burial, which would eliminate the environmental protections in the current rule.

VI. DESIGN, CONSTRUCTION AND OPERATIONS

Finding 15: The proposed unlimited wall slope at multi-well and temporary pits can lead to liner failure after installation, even if there is no visible "undue" stress prior to addition of liquid.

The proposed Paragraph 11J and Paragraph 12F(2) provide no slope limitation for a multi-well fluid management pits or for temporary pits, prohibiting only "undue" stress on the liner and slopes "consistent with the angle of repose." The term, "consistent with" is ambiguous. It is possible to construct an excavation with walls greater than the angle of repose, but such walls are unstable. Furthermore, a vertical liner is subject to tearing. NMCCA&W Ex.5 p.56 displays a photo of a pit with vertical walls, resulting in multiple tears of the liner. Furthermore, Dr. Neeper described his personal experience with liner failure near the bottom of a saltwater pit with vertical walls. [Tr. p.1197 L.5-p.1198 L.1] The testimony of industry indicated that a fixed, numerical specification for the slope of a pit wall can make the pit construction more difficult in the northwest. [Tr. p.1566 L.22-p.1567 L.12] This does not justify the absence of a safe specification everywhere.

Relating to stress on pit liners, the term, "undue" is indistinct and unenforceable unless the liner tears. It would be better to specify that a liner shall not be strained beyond its elastic limit, which is one possible meaning of "undue stress."

Finding 16: The proposed rule does not require repair of a leak at a sump or closed-loop system.

The proposed sub-paragraph 19.15.17.12A(5) NMAC has no requirement to repair a leak at a sump or closed-loop system. The transcript contains no technical testimony indicating that

these leaks should not be repaired in a timely manner. A leak at a sump could proceed unnoticed for years if the sump receives fluid only periodically and is dry when inspected.

Finding 17: The proposed wording of the rule could allow discarded drilling hardware in a temporary pit.

The wording of sub paragraph B(1) of Section 12 should be altered to say "Only fluids or mineral solids generated ... may be discharged into a temporary pit." This would clearly prohibit the previous practice of discarding drilling hardware and supplies in pits. In response to a question, Mr. Gantner offered no objection to inserting the term, "mineral." [Tr. p.133 L.8-13]

Finding 18: The proposed rule would allow unnecessary and excessive areas of oil on pits.

The proposal to allow one-third of a pit to be covered by floating petroleum products is unnecessary, and would jeopardize the environment. In the proposed Section 7, "visible" is defined as an oil slick occupying more than one-third of the area of a pit. One reason for prohibition of oil slicks on pits is protection of wildlife. Industry stated its objection to the current requirement for maintaining oil-containing booms at a pit [Tr. p.352 L.24-p.354 L.6]; however, the proponents presented no testimony demonstrating a need to allow one-third of a pit to be covered by oil. The only reason presented for allowing such a large area of floating oil is ease of measuring the area. [Tr. p.305 L.2-24] Allowing such a large area, particularly for a period of years on a multi-well fluid management pit, is particularly dangerous to migratory water birds.

VII. CLOSURE AND SITE RECLAMATION

Finding 19: At a multi-well fluid management pit, no sampling is required at wet or stained areas unless a leak is detected.

The transcript contains no technical testimony as to why wet or stained areas under a multi-well pit should be ignored, whether or not the unspecified detector has indicated a leak. The proposed sub-paragraph 19.15.17.13A(3) requires no sampling if

no leak is detected. OCC should not adopt rule amendments for which the proponents failed to provide support for their proposed change.

Finding 20: Single five-point composite samples do not reveal the true conditions, particularly at a large pit.

The proposed sub-paragraphs 19.15.17.13A(3)(a) and 19.15.17.13B(9)(a) NMAC require a random sampling under pits and drying pads. Beneath pits and drying pads, sampling should be concentrated at any stained areas, not done by combining soils sampled at five random points into a single composite sample. Such sampling may be appropriate at a landfarm with uniform conditions, but not under a pit susceptible to local seeps and leaks. The proponents provided no technical testimony to support such inadequate sampling, particularly at such a large area as a multi-well fluid management pit.

Finding 21: Under the proposed rule, records of waste burial locations would remain inaccessible to the public.

NMOGA's proposed sub-paragraph 19.15.17.13D(2) requires that the location of a waste burial be reported to OCD. (IPANM deletes this requirement.) There is no statutory requirement that OCD maintain an accessible record of burials, as would appear in a record of deeds. All waste burials should be permanently marked and recorded both with OCD and with the county authority where deeds are recorded because disturbance of buried wastes could lead to human exposure and environmental damage.

Finding 22: Revegetation of a pit or burial is not required by the language of the proposed rule.

The proposed rule does not require revegetation at site closure. The proposed sub-paragraph 19.15.17.13F3(c) NMAC allows a site to be stabilized by compaction or other means, or to be vegetated. Revegetation above buried wastes or contaminated soils was assumed by counsel and several witnesses. [Tr. p.35 L.1-3; p.71 L.8-10; p.602 L.10-19; p.652 L.19-22; p.654 L.12-13; p.909 L19-p.910 L.13; p.1545 L.17-19] The limited movement of chloride claimed by industry requires a vegetated site. [Tr. p.653 L.5-10; p.764 L.11-20; p.909 L17-18] Revegetation should be required unless the landowner specifies otherwise. Note that the proposed sub-paragraph 19.15.17.13F3(b) NMAC apparently

requires reseeding, regardless of the other options for permanent closure, which creates a contradictory rule.

VIII. IMPRECISE OR IMPROPER USE OF LANGUAGE

Finding 23: Instances of vague, ambiguous, or contradictory language appear throughout the proposed rule.

The following instances of inappropriate language appear in the proposed amendments or testimony of OCD and NMOGA.

Defining low-chloride fluids by "process knowledge" is vague. A vague specification could raise questions about the rule's validity, therefore making the rule appealable. For example, by process knowledge an operator may believe that a fluid contains less than 15,000 mg/liter chloride, but only quantitative analysis can determine the fact. [Proposed 19.15.17.7I NMAC]

The definition of "sump" is ambiguous, and the terms "subgrade" and "partially buried" are contradictory. For example, a sump that is half buried is not entirely subgrade. [Proposed 19.15.17.7P NMAC]

Various portions of the proposed rule specify "reasonable" determination of "probable" depth to ground water. What is reasonable or probable is an arguable matter of opinion, not fact. Such an ambiguous definition is unenforceable when separation of a below-grade tank or waste from water by as little as 10 or 25 feet is allowed by rule. These vague terms appear in Subparagraphs 9B(2)-(4) and 10A(1)(a). and also in IPANM subparagraphs 15A(2), 15A(3)(c), 15B(2), 15B(3)(c), 15C(3), 15C(5)(c), and 16C.

Setback of a below-grade tank or waste burial from a fresh water spring applies only to a "spring used" for various purposes. [Proposed 19.15.17.10A(4)(b) and 19.15.17.10C(5) NMAC] This provision does not comply with the rule's objective of environmental protection. Spring water, like other surface water, need not be beneficially used to be protected.

IPANM paragraph 19.15.17.7I NMAC defines "ground water" in terms of useful continuous well production, which could require determination by extensive testing and well development at a site remote from any other water production well. This proposed definition also ignores the fact that some wells may produce useful water, although not continuously. Furthermore, the

proposed definition does not state the required rate of production. This definition may contradict other definitions in state law regarding ground water.

The term, "on-site closure" in the proposed 19.15.17.10C NMAC apparently applies to closure of any pit, trench, or below-grade tank. However, the definitions of temporary pit and multi-well fluid management pit indicate they may be located "either onsite or offsite," rendering the term "on-site closure" vague. The NMOGA sub-paragraph 13D(2) requires reporting of on-site burial, leading to a similar potential conflict of words. [Reporting of burial was deleted in the IPANM proposal.]

The term "nearby" is ambiguous in the proposed 19.15.17.13B NMAC, for which only geophysical conditions otherwise specify the horizontal location of pits and trenches.

In the proposed sub-paragraph 19.15.17.11D(2) NMAC, the term "occupied" permanent residence is ambiguous. Is a residence "occupied" if the resident is absent for a year? Is it "occupied" if a certificate of occupancy was previously issued by a civil authority, but the structure is now in disrepair? If a house was constructed prior to the imposition of building codes and occupancy certificates, is it therefore always unoccupied? If an incomplete building has not yet received a certificate, is it unoccupied?

The term, "shall approve" in subparagraphs 11D(4) and 15C(3) is inappropriate in regulatory language because it removes all sense of approval, judgement, and priority, obligating the Division to approve alternative measures and exceptions. This language contradicts the division's responsibility to use its best judgment and discretion in approving variances or exceptions to its rules. If OCC decides to adopt these amendments, the term "shall" should be replaced with "may."

IX. ECONOMICS

Finding 24: The proponents failed to provide any evidence that the industry is economically unable to comply with the current pit rule.

Testimony by NMCCA&W pointed out that money spent by the petroleum industry on proper waste disposal supports business, profits, and job in other industries. [Tr. p.1768 L.6-15; Pp.1769 L.18-25] The pit rule has not curtailed leasing, and was

not the cause of the 2009 reduction in rig counts, which happened in all producing states. [Tr. p.882 L.10-24; p.1762 L.4-9; p.1770 L.11-13;] The Pit Rule did not harm the economy of New Mexico or its oil & gas industry. The overall healthy status is confirmed by the rising rig counts in New Mexico [IPANM Ex.15 unnumbered third page; NMCCA&W Ex.3 pp.1-2]

IPANM's witness agrees that these are boom times in New Mexico's "oil patch" in the southeast of the state. [Tr. p.1723 L.15-p.1724 L.1] State revenues from oil & gas lease sales have remained strong at the New Mexico State Land Office. [Tr. p.1724 L.5-24] The Pit Rule creates additional private-sector jobs for New Mexicans doing environmental work associated with oil & gas field operations. [Tr. p.1728 L.6-p.1731 L.2] The Pit Rule in its current form has proved to be a balance of important economic interests with environmental protection in New Mexico, including the important oil & gas industry.

X. CONCLUSIONS

1. NMCCA&W opposes the burial of any wastes at oil and gas production sites because, as stated in its testimony, leaving the wastes in place will result in release of contaminants into soils and ground water at levels that could be harmful to public health, welfare, and the environment. The amendment proponents have failed to demonstrate why the current rule's protections should be diminished or eliminated.

2. If the Commission decides to adopt some or all of the proposed amendments, the burial of wastes or abandonment of contaminated soils should not be approved at the proposed concentrations, which are largely designed to allow abandonment of wastes or releases would occur during most operations, rather than to provide environmental protection.

3. Because there is no technical evaluation to demonstrate that the proposed reduction of vertical and horizontal setbacks are equally protective as the current rule, the proposed setback standards should not be approved. In particular, the elimination of setbacks for burials that meet the standards of Table II should not be allowed.

4. The vague, ambiguous, and contradictory language in the proposed rule should not be approved.