**STATE OF NEW MEXICO**
**ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT**
**OIL CONVERSATION COMMISSION**

**CASE NO. 14948**

**APPLICATION OF LOS LOBOS RENEWABLE POWER, LLC (FORMS G-112) FOR APPROVAL TO INJECT INTO A GEOTHERMAL AQUIFER THROUGH TWO PROPOSED GEOTHERMAL INJECTION WELLS AT THE SIDE OF THE PROPOSED LIGHTNING DOCK GEOTHERMAL POWER PLANT, HIDALGO COUNTY, NEW MEXICO.**



## AMERICULTURE'S CLOSING ARGUMENT

The Protestant AmeriCulture, Inc., ("Americulture"), for its Closing Argument in the above-captioned matter, states as follow:

## BACKGROUND

This matter comes before the Oil Conservation Commission ("Commission") on Los Lobos' two G-112 applications, which seek authority to utilize two wells, LDG-55-7 and LDG-53-7, as "re-injection" wells in connection with Los Lobos' proposed geothermal power plant operation. The project, as characterized by Los Lobos "involves drilling and utilizing wells for production from and re-injection of geothermal fluids into the Lightning Dock geothermal reservoir." According to Los Lobos, the "subject wells will reinject native, chemically unaltered, geothermal fluid back into the Lightning Dock geothermal reservoir so that the fluids can reheat and then run through the heat-exchanger portion of Los Lobos' closed-loop binary power plant over and over again." Per its G-112 applications, Los Lobos proposes to withdraw up to 6,000,000 million gallons of water per day (or 4,166 gpm) from Well 45-7 and re-inject this same amount of water into wells LDG-55-7 and LDG-53-7. Los Lobos asserts that doing so will not result in waste, will not impair correlative rights and will not affect any underground

drinking source or contaminate any water. Los Lobos has failed to meet its burden of proof. The Commission should not approve the two G-112 applications as requested by Los Lobos.

Los Lobos claimed in its Pre-Hearing Statement that it seeks to place the two wells "on injection for well testing and potential future re-injection of geothermal fluids." Los Lobos has adamantly argued that this well testing is necessary because "the Lighting Dock Geothermal project needs to be fully constructed, commissioned and actually delivering green baseload geothermal-generated electricity to PNM by December 31, 2013" in order for Los Lobos to meet federal renewable energy tax incentives. However, federal tax incentives – and project funding – are not considerations the Commission is required under state law to consider. Rather, the Commission is tasked with addressing water quality, waste and impairment of correlative rights.

From its comments to the Oil Conservation Division's ("OCD") proposed Conditions of Approval, it is clear that Los Lobos does not intend to conduct testing – as posited in its pleadings in this matter – but rather seeks to pursue construction and full development of its proposed power plant, even though Los Lobos has no definitive information pertaining to the geothermal and geological characteristics of the Lightning Dock Geothermal Reservoir. Considering the many unknown, and interwoven, facts, the Commission should not grant the two G-112 applications as requested by Los Lobos. Rather, if the Commission determines that Los Lobos should be granted authority to proceed, the Commission should issue a permit that requires a more in-depth analysis of the Lightning Dock Geothermal Reservoir. Further, the Commission should require that prior to Los Lobos injecting any waters, Los Lobos must first provide the OCD with information necessary for the OCD to comply with NMSA 1978, §71-5-2.1(B)(1) (2012) and the OCD/Commission receive the "opinion" of the New Mexico State Engineer as required under the statutory scheme.

## Legal Standard

The issues to be addressed by the Commission, as set forth in the public notice, concern whether the proposed injection will "contaminate any underground source of drinking water or otherwise cause waters of the State of New Mexico to exceed applicable water quality standards, and whether such injection will cause waste of geothermal resources or impair correlative rights of geothermal users, as defined in NMAC 19.14.1.7(C)."

The burden of proof that the proposed injection will not: 1) contaminate any underground source of drinking water; 2) cause waters of the State of New Mexico to exceed applicable water quality standards; 3) cause waste of geothermal resources; or, 4) impair correlative rights of geothermal users lies with applicant – not with the protestant AmeriCulture or with the Oil Conservation Division. "The courts have uniformly imposed on administrative agencies the customary common-law rule that the moving party has the burden of proof." *Lone Mt. Cattle Co. v New Mexico Pub. Serv. Comm'n*, 83 N.M. 465, 493 P.2d 950 (1972); see also *International Minerals & Chem. Corp. v. New Mexico Pub. Serv. Comm'n*, 280, 283, 466 P.2d 557, 560 (1970) (applying common-law rule that movant bears burden of proof to administrative proceedings); *Duke City Lumber Co. v. New Mexico Envtl. Improv. Bd.*, 95 N.M. 401, 402-03, 622 P.2d 709, 710-11 (Ct. App. 1980) (moving party has burden of proof); *Baca v. Bueno Foods*, 108 N.M. 98, 102, 766 P.2d 1332, 1336 (Ct. App. 1988) (parties seeking benefit of statute have burden of proving they are within its terms); *Dick v. City of Portales*, 116 N.M. 472, 863 P.2d 1093 (Ct. App. 1993) (Proceedings in administrative agencies are subject to the customary common-law rule that the moving party has the burden of proof.).

**Characteristics of Lightning Dock Geothermal Reservoir**

Los Lobos failed to demonstrate that the Lightning Dock Geothermal Reservoir has known geothermal characteristics that will support its proposed operation. Los Lobos further failed to demonstrate that the geological characteristics of the Lightning Dock Geothermal Reservoir are sufficiently characterized to support a determination that its proposed operation will not contaminate any underground source of drinking water, cause waters to exceed applicable water quality standards, cause waste of geothermal resources or impair AmeriCulture's correlative rights.

Los Lobos' sole "expert witness" with any knowledge of the geothermal resource within the Lightning Dock Geothermal Reservoir was Mr. David Janney. Mr. Janney testified that he has no experience in geothermal exploration and evaluation, and he lacks expert knowledge of geothermal science. Through his testimony, Mr. Janney demonstrated his lack of knowledge of the resource at Lightning Dock. Mr. Janney discussed a geologic map of the area that mislabeled formations and failed to properly locate a major geologic feature in the area, the mid-Tertiary Muir caldera ring fracture zone as mapped in the published literature by previous researchers in the region. Mr. Janney did not log drill samples of the wells, but instead relied upon driller's and mud logger logs that are well known to be notoriously poor in quality and reliability. As a result, a poor cross section was presented that showed no structure, failed to identify important formations, did not respect well locations, but instead projected locations laterally on to an arbitrary line meant to locate the surface trace of a so-called cross section. Mr. Janney also failed to understand the source of fluorite in the area waters by his testimony that the fluoride in the water was due to the local fluoride mines. Mr. Witcher pointed out that the fluorite deposits on the area are not the source of fluoride in area waters. The fluorite deposits represent older

geothermal systems which gathered up fluorine from interaction with degassing of hydrogen fluoride from the mantle in a rift setting and alteration of minerals contained in rhyolite and granite that contain trace amounts of fluorine.

Los Lobos failed to show a basic geologic and hydrogeologic framework. Therefore, the water chemistry and water level information presented by Los Lobos has no framework under which to argue for no impact on water quality of other wells and not waste the resource by over production and injection in a small resource. Los Lobos failed to provide any information on the primary economic object, the geothermal heat at Lightning Dock, and is therefore unable to refute AmeriCulture's argument that the planned geothermal project will waste the resource because it will be unsustainable for planned production and injection. No quantitative analysis of the water level measurements by Dr. Shomaker's firm was presented either.

AmeriCulture's argument is further bolstered by the fact that the reservoir is very small and the reservoir is limited in size. One of the major reservoir characteristics is the fact that the geothermal fluids have not flowed through or resided in a limestone reservoir. Mr. Witcher presented evidence from isotopic geochemistry, using strontium isotope ratios and stable isotope ratios of sulfur that show the waters have not been in contact with Paleozoic limestone. Los Lobos maintains that the Pennsylvanian Horquilla limestone is a reservoir component that falsely increases the reservoir size and provide an imaginary location to inject fluids. Mr. Witcher also pointed out that geothermal fluids that chemically react with or originate in limestone are not sodium sulfate water with relatively low total dissolved solids (TDS) such as found at Lightning Dock, instead, are sodium chloride waters with high calcium and bicarbonate components with TDS greater than 3,000 mg/L. Furthermore, Mr. Witcher showed that Los Lobos has failed to account for one of the key geologic stratigraphic units in the region, the Bisbee Group and in

particular the Hell-To-Finish Formation, which overlies the Horquilla Formation. The Bisbee Group separates the Horquilla from the Tertiary volcanics and basin fill which comprise the out-flow plume reservoir. Mr. Witcher also indicated that available temperature logs are characteristic of outflow plume profiles.

With regard to the up-flow zone, heat flow indicates a small inflow of 150-160°C with a total heat influx less than 9 MW(thermal). To be sustainable in any reasonable time frame, power production efficiency would result in much less MW(electrical) output. Mr. Witcher testified that this inflow is likely between 300 and 1,250 gpm, using a mass and energy balance calculation. While much heat is stored in reservoir rock of the up-flow zone and out-flow plume, excessive production and injection will cool the reservoir quickly as the volumes in the up-flow zone are small and much less than the shallow out-flow plume reservoir. Also, Mr. Witcher testified that the temperature gradients indicate the system is young and still heating up on the margins where no reservoir exists. In other words, the Lightning Dock geothermal system is not in equilibrium with temperature and flow. Geothermal systems are either heating up or cooling and man-made extraction speeds up the cooling, if not done in a sustainable fashion. If the geothermal system is large, more options are available to manage a producing reservoir as Mr DeRocher testified, however, Mr. Witcher pointed out that a small resource such as Lightning Dock has few reservoir management options and the potential to greatly diminish the reservoir heat exists with an overly ambitious production and injection loop that is not properly designed and sited.

Injection into well 55-7 shows an alarming result, using data reported in the Shomaker report. Mr. Witcher testified that the water levels showed the injection into 55-7 resulted in a pressure consistent with a rise in water above the land surface and represents a significant

ground-water mound that will affect AmeriCulture wells. Dr. Shomaker testified the results may indicate equilibrium in concert with thoughts that Mr. Derocher expressed. Mr. Witcher suggested the injection curve smoothed because the injection pressure became sufficient for injected water to leak across a major fault towards a producing well (45-7). Even with the breakthrough of water flow across the fault the water level remained as a mound with flow toward the AmeriCulture wells. Injection into Well 55-7 poses a serious risk of impact to the water quality in the AmeriCulture wells – including AmeriCulture's water well permitted for domestic and geothermal use.

Mr. Witcher testified that an essentially north-south flow restricting boundary exists on AmeriCulture's property. AmeriCulture maintains that both its well A-444 and applicant well 45-7 are on the western side of this boundary. If so, it is likely that drawdown in well 45-7 will transmit to the relatively nearby A-444, thereby impairing AmeriCulture's water right in said well.

An initial chemistry sample showed low total dissolved solids (TDS) in well 45-7 that is less than the geothermal water and less than the probable water well used for mixing drill mud, the producing formation is consistent with high quality water elsewhere in the region and Mr. Witcher briefly discussed examples. Mr. Witcher's testimony that well 45-7 is actually tapping an extensive and deep high quality fresh water aquifer was undisputed. Mr. Witcher further testified that drawdown during pumping actually drew higher TDS geothermal water across a major fault zone from 55-7. This well also stopped drawing down at a fast rate in concert with well 55-7 ceasing to mound at a fast rate and consistent with initiation of water communication between the geothermal aquifer and the fresh water aquifer late in the pump and injection test.

Using cross sections and geophysical information, Mr. Witcher showed that well 63-7, well 55-7, and the Americulture 1 and 2 State wells are completed in the 'Hot Wells' horst or uplift and in the outflow plume of the Lightning Dock geothermal resource. Mr. Witcher also showed that the proposed 53-7 well is completed in another major structure domain, the Animas graben, the same a well 45-7 and the AmeriCulture Federal well.

What the evidence showed is that Los Lobos does not have sufficient information about the Lightning Dock Geothermal resource in order to meet its burden of proof. Rather, the evidence demonstrated that further evaluation of the geothermal resource is warranted before any significant pumping from and/or injection into the resource is conducted as proposed by Los Lobos. All that the evidence at hearing showed was the unknown and uncertain characteristics of the geothermal resource.

## CONTAMINATION OF GROUND WATER/EXCEEDANCE OF BACKGROUND

AmeriCulture testified though its witnesses Dr. Seawright and Mr. Witcher the existence of a reservoir of present and probable future value for domestic and agricultural purposes, located on AmeriCulture property, that is characterized by lower fluoride, total dissolved solids and temperature than that of the geothermal waters contained in the outflow plume of the Lightning Dock Geothermal Resource. Mr. Witcher testified that "mounding" of water could result in migration of saline, fluoridated water into the lower fluoride source. The last measured fluoride level in AmeriCulture's well that taps this source (domestic well A-444/ "Federal Well"/ A-45-A-S-3) was 5.6 ppm of flouride. The fluoride concentration in the outflow plume is approximately 9 to 11 ppm of flouride. Los Lobos' witness Mr. Janney testified that Los Lobos "fully expect changes in water surface," a claim substantiated during Los Lobos' "closed-loop"

production and injection test. It is clear based on hearing testimony that the proposed pumping and reinjection could result in (a) an exceedance in fluoride concentration above background resulting in an impairment of future value for domestic and agricultural use and (b) an exceedance of standards for total dissolved solids, because well A-444 is at, but does not exceed ground water quality standards, for TDS (1,000 ppm TDS). Dr. Seawright testified that increased fluoride concentration could potentially result in the commercial ruination of the low fluoride source for use in tilapia culture due to fluoride's ability to induce skeletal deformities in tilapia at water concentrations only modestly above present concentrations. Dr. Seawright testified that AmeriCulture used water from the Federal Well extensively in the past and intends to in the future.

As set forth in NMSA 1978, §71-5-8(M) of the Geothermal Resources Conservation Act, the Oil Conservation Commission has the power "to regulate the disposition of geothermal resources or the residue thereof, and to direct the surface or subsurface disposal of such in a manner that will afford reasonable protection against contamination of all fresh waters and waters of present or probable future value for domestic, commercial, agricultural or stock purposes, and will afford reasonable protection to human life and health and to the environment." (emphasis added).

**Well 55-7 is constructed in such a fashion that it does not meet NMAC requirements**

NMAC §19.14.27.8(A) requires that "all wells drilled for the production of geothermal resources, including low-temperature thermal wells, and all specialty wells, including injection and disposal wells, shall be cased and cemented in such manner as to protect surface waters, if any, useable ground waters, geothermal resources, and life, health and property. Thermal

gradient wells shall be drilled, completed and plugged in such a manner as to protect surface waters, in any, and useable ground waters."

NMAC §19.14.26.8(B) requires that "all waters of present or probable future value for domestic, commercial, agricultural or stock purposes shall be confined to their respective strata and shall be adequately protected by methods approved by the division."

Dr. Seawright testified that during its October, 2000 flow test of AmeriCulture State Well #1, that well 55-7 drew down 6 feet as a result of AmeriCulture's pumping activities thereby demonstrating a direct hydraulic connection between the relatively deeply cased well 55-7 (cased solid to 1,050 feet) and AmeriCulture's relatively shallow State Well #1 (cased to 282 feet). The casing and cementing of well 55-7 obviously does not prevent excursion of injected fluids into shallow groundwater used by AmeriCulture and is thus is in violation of both NMAC 19.14.26.8 (B) NMAC and NMAC 19.14.27.8(A)

Ultimately, the risk posed to the low-fluoride source of domestic and agricultural water is serious, as it has already been demonstrated that one of the two proposed injection wells, well 55-7, is in direct connection to shallow ground water and is thus not confined to its respective strata. Mr. Janney's "so what(!)" position concerning this known inter-connectedness and obvious likelihood of altering the quality of AmeriCulture's domestic water source demonstrates why Los Lobos' two applications as proposed should be denied.

## IMPAIRMENT OF WATER RIGHTS

Mr. Witcher testified that an essentially north-south flow restricting boundary exists on AmeriCulture's property. AmeriCulture maintains that both its well A-444 and applicant well 45-7 are on the western side of this boundary. If so, it is likely that drawdown in well 45-7 will

transmit to the relatively nearby A-444, thereby impairing AmeriCulture's water right in said well.

## WASTE OF GEOTHERMAL RESOURCES

Mr. Witcher testified that, based on regional heat flow, the Lightning Dock Geothermal resource is the result of an upflow of high temperature (≥300°F) geothermal fluid having an estimated flow rate into the Lightning Dock Geothermal system of between 300 and 1,250 gpm. Los Lobos application involves the production and reinjection of between 2,000 and 4,166 gpm. Mr. Witcher testified that overproduction of the resource could cool the resource, and that re-heating of the cooled resource could take an extended period of time, measured in perhaps hundreds of years. On its face, the application proposes to produce a greater quantity of geothermal water, at equivalent temperature, than is estimated to enter the resource. Such overproduction of the geothermal resource beyond its natural recharge rate would inevitably result in the cooling of the resource.

The Commission and Division are charged with the prevention of waste under NMSA 1978, §71-5-7. The definition of waste is found in NMSA 1978, §71-5-5 and includes the excessive use of reservoir fluids or energy. AmeriCulture concurs with OCD's comment through its counsel Mr. Brooks, that a decreased reservoir temperature would constitute waste.

Dr. Seawright testified (which was unrebutted) that temperatures have risen slowly with increased production in the outflow plume. Excessive use of reservoir energy by Los Lobos could reverse this trend resulting in the diminishment of reservoir temperature. During applicant's tracer test, tracer dye Rhodamine-WT was injected into a well located on NM State Trust Land. The tracer dye migrated more than 800 feet up hydraulic gradient to AmeriCulture

State Well #1. Los Lobos' witnesses testified that the pumping of AmeriCulture's State Well #1 at a rate of approximately 100 gallons per minute was responsible for the up-gradient migration of tracer. If, as Los Lobos contends, a pumping rate of 100 gpm reversed the known regional ground water flow in the outflow plume of the resource, then one could only imagine groundwater impact of applicant's proposed pumping rate of 2,000 to 4,166 gpm. The more likely explanation for the movement of dye up-gradient was Los Lobos' pumping and injection activities reversing regional ground water flow in the outflow plume of the resource. If accurate, the backwards migration of thermally depleted water to the south could quickly quench the shallow geothermal reservoir that AmeriCulture relies upon. This situation is specifically addressed under NMSA 1978, §71-5-8 (Enumeration of Powers) which states "the division is charged with making rules, regulations and orders for the purposes and with respect to: "(D) to prevent the premature cooling of any stratum or strata by water encroachment, or otherwise, which reduces or tends to reduce the total ultimate recovery of geothermal resources from any geothermal reservoir."

NMSA 1978, §71-5-15(A) further provides that the utilization of geothermal in excess of the amount allowed under the act is referred to as "illegal geothermal resources." This section states:

> The sale or purchase or acquisition, or the transportation, utilization or processing, or handling in any other way, of geothermal resources in whole or in part produced in excess of the amount allowed by any statute of this state, or by any provision of the Geothermal Resources Conservation Act [71-5-1 NMSA 1978], or by any rule, regulation or order of the commission or division made hereunder, is hereby prohibited, and such geothermal resources are hereby referred to as "illegal geothermal resources."

Mr. Witcher further testified that the capacity of the resource is less than 10 megawatts thermal, which corresponds to a considerably lower electrical resource capacity. Applicant's stated production objectives exceed resource capacity and if stated production objectives are attempted, there is a substantial likelihood that geothermal resource could be irreparably harmed. Even Los Lobos' expert Mr. De Rocher posited that without known data about the Lightning Dock Geothermal Reservoir, overproduction could very likely occur.

## CORRELATIVE RIGHTS

While addressing correlative rights and waste in his opening statement, OCD's counsel Mr. Brooks indicated there was a "potential issue regarding temperature" and that a serious question existed related to the remedies available to the commission, "if evidence shows impairment of use for AmeriCulture." What the evidence did show was that there exists a very likely temperature impairment and degradation of the geothermal resource if Los Lobos is permitted to pump the volume of water as requested, based upon Los Lobos' unfounded assumptions about the actual geothermal and geological aspects of the Lighting Dock Geothermal Reservoir.

As found in AmeriCulture's Exhibit 14 (September 5, 2012 letter by UIC Director Daniel Sanchez), Mr. Sanchez stated that, (1) "Los Lobos must demonstrate that its geothermal power operations will not adversely affect the AmeriCulture wells during well testing and throughout its operations. Los Lobos must be ready to undertake contingency measures and/or corrective actions(s) to prevent any adverse effect to AmeriCulture's wells. OCD permitting does not insulate Los Lobos from civil liability in the event of any damage to neighboring wells."

Dr. Seawright's unrebutted testimony showed that the existing resource temperature at its State Well #1 is approximately 232°F. He went on to testify that beginning in the near future, AmeriCulture will shift from its dependence upon oil lubricated lineshaft pumps, which are costly to purchase, wasteful of electrical energy, mechanically complex and dependent upon oil lubrication, to flash-assisted airlift pumps. Flash-assisted airlift pumping is critically dependent upon resource temperatures being considerably above the flash point of water, which they currently are for AmeriCulture's primary geothermal well, State Well #1, and for State Well #2. A reduction in resource temperature would disable all flash-assisted pumps, preventing AmeriCulture from being able to heat its aquaculture facility with these pumps.

Dr. Seawright testified that optimal temperatures are achieved by blending geothermal water and fresh cold groundwater and that excessive geothermal use can increase fluoride concentrations to a level that results in skeletal deformities in its fish. A substantial cooling of the resource would require a corresponding increase in the quantity of geothermal water required to maintain optimal temperatures, thereby increasing the overall fluoride content of the water.

Dr. Seawright testified that AmeriCulture has a valid, licensed water right for Non-Consumptive Geothermal Power Production to Support Aquaculture and Agriculture that permits AmeriCulture to non-consumptively produce a continuous flow of 1,100 gpm from either/both its State Well #1 and State Well #2, through a small geothermal power plant, to a yet-future injection well (A-45-A-S-6) that has been approved by the division. The permit was issued in, and therefore has a priority date of, October 24, 2002. This permit is of substantial commercial value to AmeriCulture. Because of the dramatic impact of resource temperature on power generation using Binary geothermal power generation equipment, particularly at lower

geothermal temperatures, AmeriCulture could be harmed financially by even modest diminishment of resource temperature.

During cross-examination by OCD's counsel, when asked if AmeriCulture's beneficial use involved the incidental loss or extraction of heat, Dr. Seawright testified that AmeriCulture's use of heat was both deliberate and intentional, and did not testify that the use was incidental. The extraction of heat from AmeriCulture's potable water is central to the beneficial use of said water. Mr. Witcher testified he did not know whether or not the proposed injection would affect correlative rights, and conversely, Los Lobos' witness Mr. Janney testified that the proposed activities would not affect correlative rights. The contradictory expert testimony, and Mr. Witcher's technically accurate answer given, only serve to demonstrate the uncertainty surrounding the potential impacts of Los Lobos' proposed project. Further, Mr. Janney was not tendered as an expert in correlative rights or geothermal regulations. Therefore his non-expert opinion on the issue of correlative rights is not evidence. Furthermore, the burden of proof that correlative rights will not be impacted lies with the applicant, not the protestant, and Los Lobos did not meet their burden to demonstrate there would be no impact to correlative rights.

**APPLICABILITY OF NMSA 1978, §71-5-2.1(B)**

Mr. Witcher's unrebutted testimony demonstrated that the original water sample from well 45-07, which had a TDS of 580 ppm, was representative of the native water resource penetrated by well 45-7. His further unrebutted testimony showed that the low TDS could not have been the result of residual drilling fluid, since the drilling fluid used had a higher TDS than the original 45-7 water sample. Evidence showed that the most likely explanation for the high temperature of water produced from well 45-7 is a result of conductive heating across a fault

zone. Mr. Witcher further testified, uncontested, that subsequent water samples from well 45-7 that showed essentially identical chemistry to the water in well 55-7 were most likely the result of hydraulic breakthrough from well 55-7 to well 45-7 that would have occurred during the closed loop production test. Based on the evidence presented, the ground water source for 45-7 and the ground water source for 55-7 are not the same.

Under NMSA 1978, §71-5-2.1(B)(2), a permit from the state engineer is not required for the use of ground water over two hundred fifty degrees Fahrenheit as incident to the development of geothermal resources permitted pursuant to the Geothermal Resources Conservation Act when all diverted ground water is reinjected as soon as practicable into the same ground water source from which it was diverted. This is precisely what Los Lobos claims is to happen – that all groundwater pumped is from the same source, and it will be reinjected into the exact same source. However, Los Lobos failed to demonstrate that all waters are from the same groundwater source. Rather, the evidence showed not only that it is highly unlikely that the water is from the same groundwater source, but further that it is far from clear whether the formations where the underground waters are located that Los Lobos proposes to pump from and inject into are, or are not, the same geologic formation and/or are hydraulically connected.

Based upon the original water sample from well 45-7, it is clear that the native (not altered by production and injection activities) ground water that is tapped by well 45-7 is a different ground water source from the ground water source for well 55-7. Therefore, production of fluid from well 45-7 is governed by Chapter 72 NMSA 1978. It is undisputed that Los Lobos does not have any water rights associated with either well 45-7 or well 55-7. Therefore, Los Lobos cannot be permitted to produce water from well 45-7 if it draws from a different ground water source. The change in well 45-7 water chemistry from its original chemistry to the

chemistry of later samples, if a result of production and injection activities, would be artificially man-made. If man made, the excursion of water from well 55-7 into well 45-7 would represent a violation of NMSA 19.14.26.8(B) by Los Lobos' due to its failure to protect waters of present and probable future value.

## DAMAGES ALREADY INCURRED

Dr. Seawright testified that AmeriCulture's original request for hearing in 2008 was in large measure based upon Applicant's then-plan to inject poisonous cooling tower chemicals into regional groundwater, and a scheme of Raser Technologies, discovered through a FOIA request, to inject water into an intermediate depth injection well beneath AmeriCulture in order to "prop up" AmeriCulture's water table. It was clear from hearing testimony that Los Lobos has not ruled out the use of wet cooling towers.

While the applicability of the tracer dye contamination was contested at hearing, the issue of damages that AmeriCulture has incurred was undisputed. Further, no logical, sound, or scientifically-based reasoning was provided by Los Lobos for why and how the tracer test was conducted. Los Lobos' own witnesses and experts could not explain anything about the tracer test – which was conducted as far away from the proposed pumping/injection well sites to yield any useful information that would pertain to the project as proposed. What the evidence did show, though, was that AmeriCulture was harmed by the tracer test – both economically and as an impairment to use of its permitted water rights.

Mr. Smiley testified on the subject of corporate structure. Lightning Dock Geothermal HI-01 LLC is a subsidiary of Los Lobos Renewable Power, LLC, which is a subsidiary of Raser Power Systems, LLC, which is a subsidiary of Cyrq Energy, Inc. This multiple-tiered, nested

LLC corporate design greatly diminishes the likelihood that a damaged individual or company could every recover damages through the courts. Absent enforcement by the commission and division, AmeriCulture's only recourse in the event of an environmental contamination or a diminishment of its geothermal resource is the courts. Depending on the severity of the impairment of AmeriCulture's correlative rights, court resolution may not be swift enough to preserve its business. If the Commission determines that a permit should be issued to Los Lobos, it is imperative that language be included to ensure that no tracer dyes – or any other chemical - would be used that could potentially pose a threat to AmeriCulture's operations.

There was also a suggestion by Los Lobos that the Joint Facility Operating Agreement (JFOA) contained a replacement heat provision that would protect AmeriCulture in the event of a diminishment of heat available to AmeriCulture. Dr. Seawright testified that on its face, the JFOA clearly applies only to the 15 surface acres defined in the JFOA. Dr. Seawright further testified that the JFOA could not possibly apply to AmeriCulture's State Geothermal Lease since as of the date of the signing of the JFOA (June 6, 1995), AmeriCulture did not have its State Geothermal Lease. AmeriCulture's State Geothermal Lease was issued more than four months later on January 23, 1996.

Clearly, the JFOA does not, on its face, require Los Lobos to replace any heat that AmeriCulture could lose based upon Los Lobos' operations as proposed off-site from the 15 surface acres expressly referenced in the JFOA. More telling though is the question of how Los Lobos could replace any heat at all; if the same geothermal resource supplying AmeriCulture is diminished based upon Los Lobos' activities it would stand to reason that Los Lobos would not be able to provide additional heat to AmeriCulture because the geothermal resource was diminished based upon Los Lobos' activities. If there was no heat for AmeriCulture, how could

there be heat available for Los Lobos to use for replacement of AmeriCulture's lost heat when both entities are drawing from the same geothermal resource?

## CONCLUSION

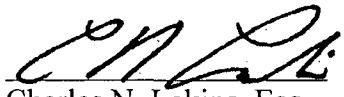
Los Lobos has failed to meet its burden of proof to show that its proposed pumping and injection activities under the two applications will not result in waste, will not impair correlative rights and will not affect any underground drinking source or contaminate any water. What the evidence at hearing demonstrated is that insufficient information about the geothermal and geological characteristics of the Lightning Dock Geothermal Resource is available to ensure that Los Lobos' project as proposed will not affect AmeriCulture's geothermal correlative rights or result in waste; or that the project as proposed will not affect any underground drinking source or contaminate any water.

Like the Grasshopper in Aesop's Fables, who acted improvidently but demanded that the diligent Ant rush to save him, Los Lobos now claims that the Commission must approve its applications so that it can meet a looming deadline of the end of 2013 in providing power to PNM. Not only is this a criterion that the Commission is not required to consider, but the disingenuousness of this position is demonstrated by the fact that since 2009 Los Lobos has had a permit to perform the exact activities it now asks the Commission to approve – albeit for different wells than those permitted under its July 1, 2009 WQCC Discharge Permit. The Commission should not act in haste in approving the proposed activities when Los Lobos own experts could not provide definitive information about the geothermal and geologic aspects of the Lightning Dock Geothermal Resource.

The Oil Conservation Division in its proposed Conditions of Approval shows that the correct approach here is caution – based upon the unknowns. If the Commission issues any permit, AmeriCulture is of the opinion that OCD's cautious approach of requiring certain planning and evaluation activities before pumping and injection is commenced is the right approach. While AmeriCulture recognizes the rights that Los Lobos does have to utilize the Lighting Dock Geothermal Resources, at the same time AmeriCulture has serious concerns that the resource cannot sustain the proposed level of pumping and that its water sources and water rights will be impaired if caution is thrown to the wind – which could result in irreparable harm to an existing underground drinking water source.

**WHEREFORE**, AmeriCulture respectfully requests that the Oil Conservation Commission DENY the applications as proposed by Los Lobos, and that if the Commission decides to issue any permits that appropriate conditions are placed on the permit that require – before any pumping and injection is undertaken – a thorough evaluation of the Lightning Dock Geothermal Resource; reporting and consideration to the OCD of the findings of the evaluation; and the requisite NMSA 1978, §71-5-2.1(B)(1) evaluation by the New Mexico State Engineer.

Respectfully submitted,
Lakins Law Firm, P.C.



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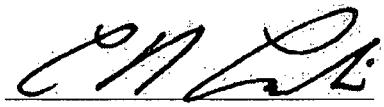
## CERTIFICATE OF SERVICE

I, Charles N. Lakins, do hereby certify that on the 11th day of April 2013, a true and correct copy of this Closing Argument was e-mailed to all counsel of record in this matter.



Charles N. Lakins, Esq.