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“What is that Stuff in My Well?”

I. The Issue

Claims of Contamination Through Subsurface Migration of Drilling and/or Fracking Materials

We have all seen the claims of contamination of drinking water wells and other waters, such as agricultural water, by production water and drilling wastes created by the drilling of oil wells and hydraulic fracturing or fracing. With the alleged migration of materials typically taking place thousands of feet below the surface, issues of proof of liability naturally arise. Moreover, the question of damages is subject to debate, given the ubiquitous nature of the materials involved and the relatively minor amounts used when compared to the vast quantities of fluids in the subsurface with which they will mix. The format of this panel is a role-playing one, with experienced scientists, attorneys and claims adjusters playing both sides of the issue.

II. Hypothetical Case Summary

Big Deal Petroleum owns a lease on mineral rights on everything below 1,000 feet on the Johnson land. Beginning at 1,950 feet, there is an O&G reservoir (the Mother Lode Reservoir) with original reserves estimated at 40Mbbbls. The surface of the lease is approximately 160 acres. 40 acres of the lease is occupied by almonds. Another 75 acres is grazing land. There is a drinking water aquifer at 450 ft. and another water bearing aquifer at 800 ft. that is approved for agricultural purposes.

The Mother Lode Reservoir was originally drilled in the 1920s with 25 vertical wells into the O&G zone, which is between 100 and 200 feet thick. Those wells were exhausted by the 1950s and have been abandoned using technologies available in the 1970s (I.e. mud with cement caps). Recent estimates suggest that the original reserves were more on the order of 80 Mbbls and that another 20 Mbbls remains in the tight sandstone that couldn't be extracted using technologies that existed between 1920 and 1950.

Big Deal has permits for twelve horizontal production wells and one injection well for stimulation, all within the Mother Lode Reservoir. The Mother Lode Reservoir is composed almost entirely of finely grained sand stone. It has very little fracturing and no faulting throughout. What fractures exist are closed, primarily by calcium carbonate.

Big Deal installed all twelve production wells and then subsequently initiated well stimulation in the form of fracing in those wells. It then installed the injection well and the plan was to reinject production water below the producing zone to further stimulate production.

Unfortunately, a few weeks after the frac job on the twelve wells, the surface rights owners began to make noise. Almond trees on the Johnson land began showing signs of sickness, as did many of the cattle. Samples of both agricultural water and drinking water showed the presence of benzene and other hydrocarbons.

The fracturing fluid that was used did contain benzene and other hydrocarbons. However, it also contained a tracer chemical, "ethyl hexyl hey there", that was not detected in any of the samples. Moreover, the Johnson property sits adjacent to Hexon's petroleum refinery, where petroleum purchased from the area is processed into a number of products, including benzene and other hydrocarbons that were detected in the water on the Johnson property.

The fracturing reports showed significant drops in pressure during frac jobs on three of the wells. The records show that across the three wells approximately 11,250 gallons of "frac fluids" and another 7,500 lbs of proppants were lost to the formation before pressure was restored.

The owners of the almond trees have sued Big Deal claiming trespass and nuisance. They allege that Big Deal's frac fluids invaded the deeper aquifer used for agricultural purposes through fractures created during the frac job and other pathways, but no further details are provided.

The owners of the cattle have not yet sued, but have sent a 60-day notice under RCRA. In their notice letter, they claim that Big Deal has disposed of hazardous wastes in violation of RCRA. The pathway of the solid wastes is not specified. Hazardous wastes alleged include the benzene and other hydrocarbons, as well as the proppants, which the owners of the cattle claim consists primarily of metal shavings that contain "lead and other regulated metals."

III. Legal Issues

Typical Claims in Subsurface Trespass Cases

Claims of contamination involving drilling materials and/or fracturing materials, typically involve claims of personal property damage, such as damage to crops, livestock or water sources. They also involve claims of real property damage, such as diminution in property value, cost of repair and "stigma" damages.

Typical legal theories include trespass and nuisance. A trespass is defined as the intentional entry onto the land of another without a lawful excuse. The entry itself need not be intentional, however. Rather, it is the act that creates the entry which must be intentional. Trespass to land is actionable *per se*. Thus, the party whose land is entered upon may sue even if no actual harm is done. Nuisance is defined as a violation of one's right to the quiet enjoyment of land. To be a nuisance, the interference must be more than just superficial; it must be substantial.

Complex issues can and do arise where the materials that have allegedly migrated are regulated materials under applicable legislation, such as the Federal Resource Conservation and Recovery Act ("RCRA"). Title 42 U.S.C. Section 6972(a)(1)(B) provides that any person may commence a civil action "against any person ... and including any past or present generator, past or present transporter, or past or present owner or operator of a treatment, storage, or disposal facility, who has contributed or who is contributing to the past or present handling, storage, treatment, transportation, or disposal of any solid or hazardous waste which may present an imminent and substantial endangerment to health or the environment. Through RCRA's Citizen

Suit provisions, the plaintiff can obtain injunctive relief to address contamination and can recover attorney fees and expert costs.

On its face, the release by Big Deal would appear to fall within these provisions. However, claims under RCRA are more difficult and costly to prove and, so, typically are not included.

Defenses

Typical defenses include: standing, such as when talking about incorporeal rights, such as a *profit a pendre*; failure to state a claim; and statute of limitations. Applicability of any one of these defenses depends on the facts and circumstances of the individual case.

IV. Issues of Proof

How Does One Go About Proving or Disproving Such a Case?

In an ordinary case of trespass or nuisance, the offending occurrence is observable: cattle wandering onto land, water flowing from one property to another, even gases traveling from a storage facility to adjoining land can all be observed. In most cases of contamination by drilling and/or fracing materials, the trespass or interference is not always observable. Take the hypothetical case for example. There, benzene and other hydrocarbons are detected in groundwater. However, sources of those chemicals other than the drilling of Big Deal's wells cannot be ruled out. As such, proving the case becomes a question of probabilities rather than absolutes. In such cases, expert testimony becomes of utmost importance.

Expert Issues

Expert issues in a case such as this are myriad. The accuracy, reliability and, ultimately, the utility of laboratory results are central to being able to establish the presence of Big Deal's chemicals in the groundwater. Moreover, it must then be shown that those chemicals in fact are causing the sickness that is affecting the almond groves and the cattle. Getting Big Deal's drilling materials from its drilling operation to the water supplies that are being used requires the subsurface migration of chemicals through impermeable layers and through thousands of feet of tightly packed sandstone.

Probably the most important issue of proof is whether Big Deal's conduct met the standard of care. While the definitions of trespass and nuisance do not expressly contain a negligence component, where the entry or interference is not intentional, negligence principles apply.

The standard of care in this regard is defined as follows:

1. Did the Defendant construct and operate their producing wells and injection wells in a prudent manner?
2. Was the injection well properly constructed and operated in accordance with state regulations and industry standards?
3. Is there physical evidence that any of the wells are leaking?
4. Does the injection well have the potential to allow vertical migration of saltwater up into the groundwater? This involves conducting migration potential calculations.

5. Is the injection interval of sufficient thickness and areal extent to accept the injected fluids?
6. Were the groundwater samples taken over a large enough area to be considered “representative”, and were the samples taken at regular intervals in order to determine if the level of contaminants are increasing or decreasing with time?
7. Does a material balance equation indicate that the level of contaminants found in the groundwater is representative of the level of contaminants contained in the fracturing and disposal process?
8. Could the contaminants be present as a result of some other activity, or were they deposited in the groundwater prior to oil and gas activity?

Well qualified experts are critical to being able to prove or disprove each of these things. Spending time with those experts to make sure they have the proper credentials and preparation in order to provide the opinions you will need to prosecute or defend such a case is critical. The panel will discuss the need for well qualified experts in the context of the hypothetical case summary.

V. Adjusting the Claim

When a claim such as this arrives on the adjuster's desk, numerous questions enter her mind. What is it that is causing the sickness in the almond trees and cattle? What is the source of the chemicals in the groundwater? Could those chemicals have caused the sickness in the almond trees? What about the cattle? What are the elements of liability? And what are the facts that support liability?