CHAPTER 4

Ownership and Use of Subterranean Space

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§ 4.01. Theories of Subsurface Ownership: An Overview.

Most nations of the world presently treat underground minerals as a common resource, owned by the nation as a whole and subject to control and development in the public interest. In those nations, land ownership consists of surface ownership, together with whatever airspace and support rights are necessary to enjoy the surface. There is no private right to extract mineral wealth from beneath the surface.

The United States, in contrast, fully applies the institution of private property to mineral resources, as well as all other components of subsurface geology. The general principle is that surface owners have the full right to develop (or leave in place) all underlying deposits and resources, subject only to legal rules that regulate exploration and development to protect various societal interests.

There are two leading theories in American law concerning the nature of private property in minerals and other underground resources. The fee ownership theory (or estate theory) treats the owner as enjoying a
possessory estate in the minerals, just as the surface owner enjoys a possessory estate in topsoil, grass, trees, and buildings. The servitude theory visualizes the owner of minerals in place as having a nonpossessory (incorporeal) right, something akin to an easement or a profit à prendre.

Subterranean spaces that are vacated in the process of mineral production generally are not "spent" resources or empty containers, devoid of worth, to be thrown away like empty milk jugs. Rather, these spaces -- tunnels, shafts, rooms, and the like -- often become highly valuable. The most important use of the vacant space tends to be for the transportation of minerals. Vacated tunnels and chambers may be valuable for the transportation of minerals from adjoining tracts. Transportation commonly involves improvement of the space with fixed facilities (e.g., rail lines or conveyors) and the fairly continual passage of workers and mobile equipment through the space.

Subterranean spaces are also highly valuable for the storage of the resource or equipment and supplies. Sometimes solid minerals are stored temporarily, as part of the plan for efficient removal processes. Storage is also important in connection with natural gas and petroleum. Depleted oil and gas reservoirs are often valuable containers for storage of reinjected hydrocarbons. Long-term storage, when the severed resource is kept underground as a reserve to handle future needs or until market conditions improve, is often economically valuable. In addition, some underground spaces are valuable as waste disposal sites.

This Chapter analyzes the ownership and use of underground spaces in connection with the production and storage of natural resources. There are two key issues. First, what rights does a mineral fee owner or mineral lessee have to use underground passages, tunnels, and spaces for the removal of minerals and for other purposes, including waste disposal? Second, what rights does an oil and gas owner or lessee have to reinject hydrocarbons into the reservoir for storage?

The fee and servitude theories have a direct impact on the allocation of these rights to underground spaces. A general understanding of the two ownership theories is essential to understand the topic. The remainder of this part therefore provides an overview of these two theories.

[1]--Severance Principles.

[a]--Types of Instruments.

Most disputes concerning the ownership and use of subterranean space arise after a severance of the mineral rights from the surface estate. For a severance to occur, a written instrument that satisfies the state's real property statute of frauds is almost always necessary. Typically, the instrument will take the form of either a lease or a deed. There are two subtypes of deeds that effect severances. The mineral rights are created by grant if the owner conveys the minerals and retains the surface; the mineral rights are created by reservation if the owner conveys the surface and retains minerals.

[b]--Further Separation of Subsurface Rights.

Subsurface rights themselves are divisible into separately owned elements. One person may own coal rights and another own other minerals. One may own oil and gas rights from one sand, with another owning the rights from deeper sands. With the subdivision of the mineral estate into separately held bundles of rights, the potential for disputes to arise concerning the ownership and use of underground spaces becomes greater and greater.

[2]--Fee Ownership Theory.

[a]--Ad Inferos Doctrine.
Our nation's deference to private ownership of minerals is inherited from England, where the common law applied the Latin maxim, *cujus est solum, ejus est usque ad coelum et ad inferos*: to whomsoever the soil belongs, he owns also to the sky and to the depths.\(^{(5)}\) This maxim, which heavily influenced the fashioning of natural resource ownership rules in the United States, epitomizes the fee ownership theory of mineral ownership. Under this view, the owner has a possessory estate in fee simple in the minerals in place, while they are still in the ground.\(^{(6)}\)

Maxims as a general matter are dangerous things in their capacity to turn into fossils. As they are repeated generation after generation, they inhibit thinking, forestall reexamination of underlying premises, and hide a host of problems. The conceptual drawbacks of the fee theory, as manifested in its fullest form by the *ad inferos* doctrine, became prominent when applied to airspace uses. The upward projection of surface boundary lines, into and past the stratosphere, would have quashed twentieth century aviation.\(^{(7)}\) As widely known as the maxim may be, for this reason and for others,\(^{(8)}\) it is not literally the law of any jurisdiction in the United States. Ownership of airspace rights, at least when defined as the right to exclusive possession, does not, in reality, extend to the heavens; instead, it ceases at the point the landowner can no longer make actual, beneficial use of the airspace.\(^{(9)}\)

Subsurface ownership rights, like airspace rights, also cannot be governed literally by the *ad inferos* maxim. If every surface owner owned to the center of the earth, all parcels of land would converge at the core of the earth where all surface owners would presumably be neighbors or co-owners.

Many maxims despite their flaws have some value, and the *ad inferos* concept has three redeeming features. First, notwithstanding its potential absurdities, the maxim reflects an ingrained preference for maximizing the amount of subterranean private property. Thus, it provides a useful point of departure for talking about the bundle of rights that comprise the ownership of real property. In this context, the maxim supports the premise that private owners should be as free as possible in deciding how to define, divide, and subdivide elements of subsurface ownership.

Second, the *ad inferos* maxim soundly emphasizes that land ownership is inevitably three-dimensional in nature. Two dimensions, while they may look good on a paper map, do not even suffice for a snake in the grass. All physical objects, animate and inanimate, have mass and occupy volume. For this reason, when the term "land surface" is visualized as two-dimensional, all human uses of land necessitate their use of either airspace, subsurface space, or both. Hence, whatever principles of property law apply to airspace and to subsurface rights should be capable of general application, rather than reserved to meet the needs of exceptional or unusual land uses.

Last, the *ad inferos* doctrine, in its grandiose pretensions, refutes the popular layperson's conception that property refers to tangible things. Three-dimensional property means that when physical materials are sold and removed, ownership continues. Trees and topsoil can be sold and removed, minerals quarried and mined, and yet the owner still keeps a fee simple absolute -- even if only in a hole. As we shall see later, the failure to appreciate this basic principle -- that physical substances and the space they occupy are not the same thing -- is responsible for much of the doctrinal confusion surrounding the ownership of underground space in connection with mineral development.\(^{(10)}\)

**[b]--Fee Ownership of Solid Minerals.**

For solid minerals and similar substances, such as rock and soil, the *ad inferos* doctrine means that surface boundary lines are projected vertically, with each surface owner having the exclusive right to remove or extract minerals from under her parcel. Legally, the boundaries between adjoining properties are treated the same as surface boundaries. The mining company must stay within the confines of its subsurface parcel.
Subsurface trespasses, whether or not intentional, are actionable, with courts commonly awarding damages, injunctive relief, or both.\(^{(11)}\)

The fee ownership theory applies both to complete and severed mineral estates. When there is no severance, the surface owner's possessory estate extends underground, presumably to whatever depths the \textit{ad inferos} principle may, in fact, descend. When a severing conveyance has occurred, the terms of the instrument must be consulted. The instrument may create a separate possessory estate in the minerals, regardless of whether exploration or development has commenced. Whether the instrument, in fact, creates a separate mineral estate or only a servitude depends on the terms used and, if there is a problem of ascertaining the parties' intent, how they are interpreted.

\[3\]--\textbf{Servitude Theory (Profit à Prendre)}.

The second theory as to the nature of mineral rights holds that the owner has a servitude: an exclusive right to remove the minerals. Under this theory, the minerals are not possessed by the owner prior to removal -- indeed, they are not capable of possession by anyone prior to removal.

In general, the servitude theory applies equally to situations of complete or severed ownership. When the surface owner also has full mineral rights, she has the right to reduce the minerals to possession.\(^{(12)}\) The clarity of this theory, however, is often muddied by judicial statements that a surface owner who is in actual possession of the surface is in constructive possession of the minerals in place.\(^{(13)}\)

When there is a severance, the mineral owner has a \textit{profit à prendre}. Under modern American law, a \textit{profit à prendre} is treated the same as an easement for most purposes. Typically, the profit is in gross, meaning that its ownership is not tied to the ownership of other land in the vicinity (i.e., to a dominant estate).

For nonmigratory substances, the owner typically has either a possessory estate or a servitude. It is only in cases of a severance that a servitude will arise, when the terms of the severing instrument are so interpreted.\(^{(14)}\)

\[4\]--\textbf{Ownership of Oil and Gas: Rule of Capture}.

[a]--\textbf{Fee Ownership Theory}.

Oil, gas, and other hydrocarbons are considered real property prior to their severance from the ground.\(^{(15)}\) There are two competing positions, however, as to what type of real property they are. A literal application of the \textit{ad inferos} doctrine to oil and gas would have had drastic anti-developmental consequences because, unlike solid minerals, oil and gas are migratory. Whenever oil and gas is produced from a reservoir that underlies more than one surface parcel, pumping can withdraw some of the resource from beneath neighboring parcels.\(^{(16)}\) A strict projection of surface property lines downward would treat withdrawals of fugitive natural resources as actionable trespasses. As a consequence, all surface owners would be considered co-owners of the reservoir as an entity, with no exploitation of the resource realistically possible without their voluntary agreement. For this reason, last century American state courts firmly repudiated the implications of the \textit{ad inferos} doctrine in this context. Instead, they applied the rule of capture, first to water law,\(^{(17)}\) then to oil and gas.\(^{(18)}\)

Despite the severe problem the traditional \textit{ad inferos} formula poses for oil and gas development, a number of states have retained its vestiges, attempting to force a square peg into a round hole. Roughly half of the states, including Pennsylvania and Texas, follow what is called the "ownership-in-place" theory.\(^{(19)}\) They treat oil and gas in the same way as solid minerals, permitting a corporeal estate in fee to the oil and gas
lying below the surface. This position then permits severance of the oil and gas estate, with fee ownership separate from the surface estate.

The fee ownership theory, as it is usually stated, implies an unqualified estate -- a solid property right that cannot be lost. In practice, however, the rule of capture trumps the ownership theory. All ownership-in-place states permit a neighbor who produces from a common reservoir to acquire title to the oil and gas production. \(^{(20)}\)

### [b]--Servitude (Non-ownership) Theory.

The alternate view, focusing on the migratory nature of oil and gas, rejects the principle that the surface owner has fee title to the resource under the land surface. Under this view, adopted by "non-ownership" states such as Kentucky and Ohio, \(^{(21)}\) the owner cannot have an estate, only a servitude. \(^{(22)}\) Ownership consists of incorporeal rights -- the right to search for and produce oil and gas -- which are variously described as a profit à prendre, license, servitude, and a chattel right. \(^{(23)}\) Thus the owner is treated as having no ownership of the oil and gas beneath her tract unless and until she reduces the oil and gas to possession by production. \(^{(24)}\)

The doctrinal virtue of the non-ownership \(^{(25)}\) or servitude theory is its full compatibility with the rule of capture. The nature of the servitude is that the owner has the right to drill a well and take possession of the oil and gas, but, until that happens, there is the chance that instead a neighbor will take rightful possession of the oil and gas by capturing in through a well on the neighbor's land. \(^{(26)}\)

### [5]--Why Fee and Servitude Theories Matter.

For many of the problems involving the creation of mineral rights and the interpretation of mineral instruments, it does not matter whether the nature of the mineral rights is fee ownership or a servitude. For example, both views agree that minerals are real property, provided that the duration of the interest is not limited to a fixed period of time. Therefore, the statute of frauds and many other conveyancing formalities apply to the creation of mineral rights, regardless of the theoretical nature of those rights. There are several instances, however, where the choice between the fee ownership theory and the servitude theory does make a difference. These instances involve the creation, transfer, and termination of the mineral interest.

### [a]--Creation Rules.

By and large, the same creation rules apply both to grants and reservations of fee interests in land as they do to grants and reservations of servitudes. The differences that presently exist are relatively minor. For example, when evaluating the adequacy of legal descriptions of the land, some courts apply a more lenient standard for servitudes than for fee estates. And some state statutes governing deed formalities and interpretation apply to fee estates but not to servitudes. \(^{(27)}\)

### [b]--Transfer Rules.

Transfer rules are generally the same, whether the mineral rights are fee or servitude in nature. A writing complying with the statute of frauds is generally necessary for both. With servitudes, however, there is the potential for the mineral rights to be appurtenant to some estate rather than in gross. This result, which the mineral owner almost always would not desire, drastically impacts transferability. An appurtenant profit, for example, cannot be conveyed separate and apart from the dominant estate.

### [c]--Termination Rules.
[i]--Abandonment.

In terms of initial creation, when the drafter clearly expresses her intent, there is no durational advantage to having a fee estate rather than a profit à prendre in minerals: both may be perpetual. However, a fee estate is not capable of abandonment at common law. Thus, unless altered by statute or judicial decision, the owner of a mineral fee estate bears no risk of loss under the doctrine of abandonment, regardless of how long the property lies unused. [28]

In a number of states, a profit à prendre, like other servitudes, is subject to abandonment on the theory that it is an incorporeal interest in land. [29] Some states, however, distinguish profits from other servitudes in this regard, treating them as corporeal and incapable of abandonment. [30]

[ii]--Merger.

When a transfer results in the same person owning both the servient estate and the servitude, the doctrine of merger can apply. Occasionally, this can result in unintended destruction of a servitude. [31] When there is a mineral estate rather than a mineral servitude, merger is less likely to occur upon consolidation of ownership. [32]


What rights does the fee owner of solid minerals have in underground passages and tunnels used to remove minerals from the ground? The prevailing view in the United States invokes the estate theory: the grantee of solid minerals in place receives a corporeal freehold estate, rather than an incorporeal right to search for and remove the minerals. This freehold estate, after minerals and other substances are removed, carries over to the vacant shell, chamber, passage, or tunnel. Thus, the grantee is said to have the "absolute right," at least until it removes all the minerals, to use the tunnels for any purpose the grantee desires, including the removal of minerals from adjacent lands.

The key question, which the estate theory by itself does not resolve, is what type of fee estate in the vacant space does the mineral owner have? There are two choices: a fee simple absolute or a defeasible fee simple? [33]

[1]--Fee Simple Absolute.

[a]--Nature of Ownership.

If the mineral owner's rights to use the vacant space are a fee simple absolute, they have the same duration as fee simple absolute estates generally do (potentially perpetual). This is what it means to have an estate that is not defeasible. This view treats the mineral owner's estate in the vacant space exactly the same as surface estates.

The leading early American case, Lillibridge v. Lackawanna Coal Co., [34] adopted the fee simple absolute characterization. The Pennsylvania Supreme Court held, in a four-to-three decision, [35] that the grantee in fee of "all the merchantable coal" underlying a tract also maintained fee ownership in the space left by the removal of the coal. For this reason, the court refused to enjoin the coal owner's use of tunnels created by coal mining to transport coal from an adjoining tract.

The Lillibridge opinion is extremely formalistic. Relying on prior Pennsylvania cases, the court started with the proposition that coal ownership was a corporeal estate. From there, it reasoned that "the coal in place is a
part of the very substance of the soil," and thus the law should not "regard the space which the substance occupies as other than the substance itself."(36) To hold otherwise, according to the court, would compel the conclusions that the coal was not a corporeal substance and that the grantee had only an incorporeal right to remove it. Several times the Lillibridge court referred to the estate as "absolutely owned" by the coal company in fee. This particular feature of the opinion is surprising, inasmuch as the deed to the coal company contained an express reverter clause.(37) The court relied heavily on English precedents(38) in deciding that the coal and that the vacant container had to receive identical, lock step treatment in terms of ownership. However, it misread these precedents.(39)

One other point in Lillibridge deserves emphasis. The coal company used the subterranean passageways to cross Lillibridge's tract, with the opening to the coal mine on its own land. None of the coal from the adjoining tract ever moved across the surface of Lillibridge's land.(40) The court, in justifying its fee simple theory, stressed that Lillibridge was claiming a property right and seeking an injunction when he had suffered no injury at all.(41) This part of the court's opinion makes far more sense than its formalistic estate theory. A strong argument can be made in favor of a functional approach that does not confer the mantle of "property" on an interest, the protection of which does not benefit the claimant in any material sense, apart from "hold-out" value to be used as leverage in negotiation.(42)

One other jurisdiction, Illinois, has case law that may be read to endorse the Lillibridge view that the coal owner takes a fee simple absolute in vacant spaces. The 1910 case of Attebery v. Blair(43) involved a marketable title problem in which the buyer expressly bargained for the right to use subsurface rooms and mining ways to mine coal from adjacent lands. The seller, Attebery, owned complete title to most of the land, but had conveyed a strip of the land to a railroad, with "coal rights reserved." Blair objected to title on the basis that, after he had mined the coal under the railroad strip, he would not be able to use the vacated spaces to mine adjacent lands. Holding for Attebery, the court observed that the grantors had the right to use the underground space not only to mine their retained lands, but also all other lands:

[T]here is no ground for a distinction between such use [to mine the grantor's remaining land] and the use of the mining ways for access to other lands, . . . The deeds, with the reservations, operated as a separation of the rights of property as between the land and the coal and the mining rights, and we see no reason why the grantors could not use the space where the coal was found in any way which they saw fit, as though no conveyance had ever been made.(44)

Two years later, the Illinois Supreme Court, in Schobert v. Pittsburg Coal & Mining Co.,(45) relied heavily on Lillibridge to hold that a grantee could use a passage cut through coal to mine an adjacent tract. Although the Illinois court quoted the broad "fee simple" language of Lillibridge, the grantee, in fact, had not removed all the coal. Thus, the case did not present the problem of duration of the fee ownership of underground space.(47)

Dictum in a subsequent opinion arguably undercuts Attebery. In Shell Oil Co. v. Moore,(48) the issue was whether a deed conveying only the surface of certain land, with an express reservation of coal and "the right to the perpetual use" of underground passages and entries, left oil and gas rights in the grantor. In holding for the grantor's oil and gas lessee, the court observed that this provision

is intended to increase the grantor's mineral estate to the extent that passageways may be used in perpetuity, even though it might be construed without such limitation that the surface estate could not be burdened with any greater privilege than by passageways for removing the coal from under the described land.(49)
Significance of Absolute Fee Ownership.

The practical significance of the absolute fee theory is that transporting minerals from adjacent tracts through underground passages is lawful. There is no restriction of the benefit to a dominant estate. In principle, it does not matter whether mining is continuing in the subject tract or even whether any minerals are still in place in the subject tract. As long as the underground spaces are economically valuable, the owner of the mineral estate may continue to utilize them.\(^{(50)}\)

Moreover, the fee owner is not limited to mining uses of the vacant space. Waste disposal and other non-mining-related uses, provided that they are lawful, are permissible. While there are no cases in point, this conclusion follows from the general nature of fee ownership and the fact that the severing deed does not contain express use restrictions.\(^{(51)}\) Fee ownership, however, does not preclude the possibility that the surface owner or other neighbors may have nonpossessory property rights in the vacated space.\(^{(52)}\)

The fee simple absolute rule is a minority position. Indeed, it is not clear whether any state presently applies it as the general rule of implication for the construction of mineral severances. Pennsylvania abandoned \textit{Lillibridge} in 1899,\(^{(53)}\) and the status of the rule in Illinois is unclear. Virginia may have adopted the fee simple absolute rule as a statutory presumption in 1981.\(^{(54)}\)

For this reason, the modern significance of the absolute fee characterization is that parties may expressly contract for it, generally with respect to the subsoil or a stratum or specifically with respect to vacant spaces. It is possible for a landowner to sever her fee estate vertically and absolutely. The purest example is a deed that conveys the surface estate only, with the grantor excepting the entirety of the subsoil, including but not limited to minerals. In this case, the grantor would retain fee simple absolute ownership of all subterranean spaces.\(^{(55)}\) The express language of the deed or other instrument has to be interpreted to determine whether it has this effect.\(^{(56)}\)

Defeasible Fee Simple.

Nature of Ownership.

An alternative application of the estate theory posits that the mineral owner has a defeasible fee simple in the vacated underground space. Since the early part of this century, this view has dominated in the American courts. Interestingly, the leading case is also from Pennsylvania. \textit{Lillibridge}'s broad statements about the nature of ownership of underground space were called into question only eight years later in \textit{Webber v. Vogel}.\(^{(57)}\) Like \textit{Lillibridge}, the court in \textit{Webber} upheld a coal owner's right to use underground passages to transport coal from an adjacent tract. However, the court said that \textit{Lillibridge} "was intended to go no further" than to hold that the coal owner's fee estate in the chamber containing the shell reverted to the grantor once the coal was removed. \textit{Webber} based its holding on the intentions of the parties:

In nearly every case the instrument itself discloses the intention of the parties that the coal shall be mined; that is, that the subject of the grant shall soon be exhausted or consumed. It is severed from the under and over lying land for the purpose of turning it into money. It would not only be a perversion of the intention to merely use such an estate to reach other coal, but such use would be a continual menace to the stability of the surface. No owner of the upper land could tell when his estate would cease to be disturbed by workings underneath.\(^{(58)}\)

Subsequent Pennsylvania cases have continued to adhere to the position that the mineral owner's right to the excavated cavity is "an estate determinable, which reverts to the surface landowner by operation of law at
Ohio is one of the few jurisdictions beside Pennsylvania that has provided a detailed explanation of its theory of the ownership of underground space. In *Moore v. Indian Camp Coal Co.*, the Ohio Supreme Court stated that the owner of a coal deposit also owns a fee simple in "the space left by excavation of the mineral, so long as it remains a mine; that is to say, until the mineral shall be practically exhausted." The court expressly rejected the surface owner's argument that the coal owner had merely an easement to remove the coal. Instead, as a fee owner of the chamber, the coal owner had the right to use it for any purpose or purposes desired, including the transport of coal from other tracts.

The coal veins in *Moore* were only three to five feet thick, and Moore complained that the coal company, in its mining, had excavated and used parts of the overlying and underlying strata. The court soundly rejected this argument, ruling that the coal owner has the same possessory rights to the excavated parts of the surrounding strata as it has to the space formerly occupied by the coal itself.

Several jurisdictions, in addition to Pennsylvania and Ohio, have adopted the defeasible fee simple rule to define the property rights to subterranean spaces vacated by solid mineral extraction.

**[b]-Significance of Defeasible Fee Simple Ownership.**

The defeasible fee theory authorizes the transportation of minerals from adjacent tracts through underground passages so long as the possessory estate has not terminated. Ordinarily, this means either that minerals capable of extraction are still in place in the mineral estate or that mining is presently continuing.

Under this theory, the question arises as to whether the latter element -- that mining is presently continuing - - is necessary. Must the coal company that is mining adjacent tracts continue simultaneously to mine the subject tract? The judicial pronouncements on this issue are sketchy. In *Webber*, the Pennsylvania court stated that "good faith mining" of the subject tract must continue. Subsequently, in *Westerman v. Pennsylvania Salt Mfg. Co.*, the court interpreted this language as permitting the "temporary suspension of operations" when the coal owner planned to remove the coal left in the pillars by a second mining after using the passageway to remove coal from nearby lands.

The West Virginia court, in *Fisher v. West Virginia Coal & Transportation Co.*, imposed a similar condition on the defeasible estate, expressing it in terms of due diligence. The subterranean passages may be used for transporting coal from adjacent tracts "so long as the coal under the [subject tract] is neither exhausted nor abandoned, and mining is being prosecuted with due diligence." The coal company had suspended mining under the subject tract, planning to mine the neighboring tracts first. The court ruled that this "temporary cessation" did not impugn due diligence because the mining operation complied with "modern and approved practices."

While there may be sound policy reasons for the "good faith" or "due diligence" rules, they do not fit easily with the logic of defeasible fee simples. As a general matter, the mineral fee owner has no duty to engage in present mining operations. Absent express or implied duties to mine, the owner has the right to leave the resource in place for possible future production. Usually, the only limitation to the estate is the exhaustion of the minerals.

*Webber* and *Fisher* appear to add an additional limitation to the mineral estate. The mineral owner who uses subterranean passages to mine adjacent tracts without at the same time mining the subject tract in "good faith" or "diligently" is a trespasser. Applying the concept of defeasible fees, presumably title to the
passages and other vacated spaces may revert to the surface owner, notwithstanding the presence of commercial quantities of minerals in the subject tract. Perhaps the unmined minerals revert as well. The wisdom of this approach is questionable for two reasons. First, the fact question of good faith or diligence is very hard to evaluate. Second, it encourages economic inefficiency. In order to preserve title to the vacant space, the rule gives the mineral owner a strong incentive not to suspend mining the subject tract, even though present mining of only the adjacent tracts may make more sense in terms of mining plans and mining technology.\(^{(72)}\)

Storage of waste in vacated spaces raises special problems under the defeasible fee theory. Many of the defeasible fee cases state that the fee owner may make any lawful use of the space. This is a normal attribute of an estate in land when the deed bears no express use restrictions. But the reported cases all deal with transporting minerals and related mining issues, such as disposing of rock and refuse. For non-mining-related uses to be legal, the defeasible estate must not have terminated.\(^{(73)}\) At a minimum, minerals in commercial quantities must still be in place, with some jurisdictions requiring that mining be continuing in good faith or diligently.

Even assuming that waste storage would not cause a total or partial termination of the defeasible estate in the subterranean space, the doctrine of waste (no pun intended here) poses additional problems. In general, the waste doctrine means that the owner of the future interest (the surface owner) has the right to receive the estate intact, without substantial diminution in value. The disposed materials will remain in place after expiration of the defeasible fee, leaving the surface owner with no economically viable use of that space. Thus the owner of the surface has a strong argument that a waste disposal plan violates her rights. As a practical matter, this line of analysis means that, when the mineral estate has not yet terminated, the rights of both the mineral and the surface owners should be obtained for a waste disposal plan.

[3]--Servitude Theory.

[a]--The Clayborn Case.

In the 1920 landmark case of Clayborn v. Camilla Red Ash Coal Co.,\(^{(74)}\) Virginia clearly rejected the view that the mineral grantee obtains a freehold estate or possessory right in vacant space. Instead, the Virginia Supreme Court adopted the theory that the mineral owner has only an easement in the vacant space, with the purpose limited to the removal of minerals from the subject tract.

In Clayborn, the plaintiff owned the surface estate and the defendant coal company owned the coal deposit pursuant to a deed.\(^{(75)}\) To mine Clayborn's coal, the coal company built and used an underground haulway, with its tracks placed on the substrata underneath Clayborn's coal deposit. The haulway traversed Clayborn's land. When the coal company acquired rights in tracts of land on both sides of Clayborn's, it used the haulway in connection with those adjacent tracts. On one side of Clayborn's land, the coal company located certain coal mining equipment; on the other side, it had a coal lease under which it had the right to mine as much coal as it wanted.

Clayborn sought to enjoin the coal company from using the underground haulway to transport coal from the coal lease to the company's mining equipment on the other side of his tract. In defense, the coal company claimed to have fee ownership of the coal vein and the substrata and, thus, the right to use the tunnel for whatever purposes it desired.

In a case of first impression for Virginia, the state supreme court held for the plaintiff. Rejecting the fee ownership theory, the court criticized the precedents from other states as "unsatisfactory and illogical in themselves."\(^{(76)}\) While conceding that a coal grantee acquired a corporeal fee ownership of the coal itself,
the judges found no logical reason to treat the area containing the coal the same way. Instead, the court required that the coal grantee expressly bargain for such extraordinary rights: "If the coal owner expects more in connection with his easement for removing the coal, he ought to stipulate for it."(78)

The Clayborn court, unlike earlier courts that had developed the fee ownership rule, was highly concerned with consistency between subsurface and surface property rules. First, the court analogized to a timber purchaser's rights to standing trees. The buyer of a tree on the land of another gets the tree itself "with an easement for support and removal, but he does not acquire any corporeal right in the soil or in the space which the tree occupies."(79) Second, the court thought that the coal grantee's implied subsurface rights to use space for coal removal should parallel its implied surface rights. There is no "substantial difference between the use of a mine track in the mine which rests upon the stratum or earth below the coal and a tramway outside of the mine resting upon the surface."(80)

Victory for Clayborn did not strip the coal company of all rights to the vacant spaces it had created. Instead of fee title, it acquired the right "to use all of the spaces [opened] for transporting coal from other parts of the same tract so far as such spaces were reasonably necessary for that purpose."(81) This access easement thus is limited in purpose, duration, and extent to the burdened land. As mining progresses, the servient estate evidently decreases in size if and when parts of the vacant space are no longer "reasonably necessary" for the remaining mining.(82)

As for remedies, the court found the coal company liable in trespass for using the passage and granted Clayborn's request for an injunction as to the underground tunnel.(83) The court remanded Clayborn's claim for damages without providing guidance as to their measurement.(84) However, the court indicated that the lack of actual damage to the surface estate did not justify withholding injunctive relief.(85)

[b]--Statutory Modification of Servitude Theory.

The Clayborn rule prevailed in Virginia for 61 years, until the Virginia legislature overruled it in 1981. Section 55-154.2 of the Code of Virginia provides:

Presumption regarding estate of owner of mineral rights. -- Except as otherwise provided in the deed by which the owner of minerals derives title, the owner of minerals shall be presumed to be the owner of the shell, container chamber, passage and space opened underground for the removal of the minerals, with full right to haul and transport minerals from other lands and to pass men, materials, equipment, water and air through such space. No injunction shall lie to prohibit the use of any such shell, container chamber, passage or space opened underground by the owner of minerals for the purposes herein described.(86)

The statute is effective for transactions entered into after July 1, 1981.(87)

The statute, in its brevity, raises several questions of interpretation that appear to be unresolved.(88) First, since the statute speaks in terms of a presumption, what facts may rebut the presumption? Obviously, deed clauses that "otherwise provide" will allocate ownership of underground spaces to the surface owner. If this is a "true presumption," other facts and circumstances surrounding the deed transaction may also be offered as rebutting evidence.(89)

Second, what is the duration of the statutorily presumed ownership? Does it continue after the exhaustion of all minerals on the subject tract? While the statute expressly confers the right to use underground spaces in connection with mineral production from other lands, it is silent as to duration. There are plausible arguments on each side of this question. Because the statute imposes no time limits on the transportation
rights, arguably they should continue indefinitely -- for so long as transportation rights conceivably retain value. This position approximates the fee simple absolute theory, originally announced in Pennsylvania by Lillibrige.

On the other hand, the prevailing American rule is that the mineral owner takes a defeasible fee to the vacated spaces, with defeasance occurring upon exhaustion of the resource from the subject tract. This argument -- that the legislature meant to conform to the American majority rule -- might be supported by reference to the Virginia mineral lapse statute. That act permits a surface owner of land east of the Blue Ridge Mountains to bring an action to extinguish stale mineral rights, creating an evidentiary presumption that commercial minerals do not exist when exploration and mining have not occurred during the preceding 35 years. Clearly, 35 years of nonuse of the vacated underground spaces should permit the surface owner to terminate the mineral owner's statutory transportation and other rights under Section 55-154.2 if the subject tract has no commercial minerals, coal, or other substances.

The last problem of interpretation for the Virginia underground space statute has to do with remedies. Since the statute expressly prohibits an injunction but is silent as to other forms of relief, may the surface owner obtain monetary compensation (e.g., damages)? By reading the statute literally, the surface owner's theory would be that the legislature intended to authorize the mineral owner to use the spaces for transportation, without fear of delay, interruption, or stoppage, but to leave open the question of compensation for decision on a case by case basis. If compensation is due, the surface owner's action would be in either trespass (albeit statutorily authorized) or implied contract (quantum meruit). The weakness of this argument is that it undercuts the statutory concept that the mineral owner actually owns the underground spaces.

[4]--Mineral Leases.

When an operator mines under a lease, that lessee obtains complete title to the removed coal or other minerals. However, a lessee's rights to the coal in place are less than fee ownership. For this reason, the lessee may not have the same right to use vacant underground spaces as the fee owner.

The few cases that address this issue are split. Relying upon the idea that the lessee has fewer rights than a fee owner, courts in Alabama and Arkansas have ruled that a lessee has no right to use underground passages to mine coal from adjacent tracts. In effect, this view applies the Clayborn servitude analysis, at least to mineral leases.

Several other courts find no distinction between mineral lessees and mineral fee owners, giving lessees the same right as fee owners to transport coal from nearby lands. In Moore v. Indian Camp Coal Co., the Ohio Supreme Court indicated that, for all severances of mineral rights from surface ownership, the mineral owner gets a fee simple determinable in the containing chamber. Likewise, in the Kentucky case of Cawood v. Hall Land & Mining Co., the court held that a coal lessee has the right to use underground passages to remove coal from nearby tracts for the time period that coal is mined on the leased tract.

Which of these rules is better is problematic. Both the Moore and Cawood judicial explanations seem strange. Their line of thought is that fee ownership of the chamber or vacated space is bound up with, and must conform to, absolute title to the removed coal. Courts have failed to explain why this should be so, regardless of the form of the transaction. When the parties have chosen a lease, and the language of the instrument defines the lessee's rights as the mere privilege to remove coal, there seems to be little justification for giving the lessee an expansive, implied possessory estate to the vacated space.
On the other hand, coal leases serve the same practical, commercial needs as fee conveyances and, whenever reasonably possible, the rules that govern both instances should be similar.\(^{(106)}\) The Alabama and Arkansas rules raise the practical problem of having to evaluate, perhaps on a case by case basis, whether the lessee has only the right to remove coal or a possessory leasehold.\(^{(107)}\) In terms of the law generally, both leases and fee simples are present possessory estates. Usually a tenant's possessory rights are as solid as a fee owner's; the only distinction being duration. For these reasons, the preferable rule on balance is to treat mineral leases and mineral fee conveyances the same with respect to the right to transport minerals from other lands.

[5]--The *International Salt Company* Case.

The most recent decision to deal with the question of ownership and use of vacated underground space is a 1989 decision of the Second Circuit, *International Salt Co. v. Geostow*.\(^{(108)}\) *International Salt Company* operates what is said to be the largest salt mine in the world, the Retsof Mine in New York. Geostow planned to dispose of incinerator ash in parts of the salt mine. It acquired from surface owners the rights to the containing chamber in sections it contended were "mined out." The areas in question had been mined long ago by the "pillar" method, which had created one huge chamber contained entirely within the salt deposit.\(^{(109)}\)

Two main issues were presented. *International Salt* claimed to own the excavated cavity in fee simple absolute under a series of deeds that conveyed "forever, all mines, veins, seams and beds of salt."\(^{(110)}\) Because the word "mine" has more than one meaning, the key was whether it referred to the excavation, or containing chamber, as it was opened, or only to the salt deposit. Geostow won on this issue. Although the court found several of the deeds to be ambiguous, it held that the deeds conveyed a fee simple interest in the salt only, and not in the containing chamber.\(^{(111)}\)

On the second issue, the court held that *International Salt* had the exclusive right to use and enjoy the containing chamber because the mine was not exhausted.\(^{(112)}\) The parties disputed whether "second mining" by "pillar robbing" was feasible. For two reasons, the Second Circuit agreed with *International Salt* that the commercial and technological feasibility of "second mining" did not matter. First, *International Salt* was presently extracting salt at selected points on the mine's perimeter.\(^{(113)}\) Second, there were untapped beds of salt below the bed being mined; future access to these lower beds would necessitate at least partial access to the upper containing chamber.\(^{(114)}\) The district court advanced two additional reasons why the salt company should have exclusive rights over the vacated space.\(^{(115)}\) However, the appellate court declined to address either in its opinion.

Neither the district nor the circuit court elucidated the scope of *International Salt* 's exclusive rights to use the containing chamber. The right to transport salt from adjoining tracts within the mine is expressly authorized,\(^{(116)}\) but nothing else is stated. *International Salt* argued that it was using the entirety of the excavated cavity; many areas contained conveyor belts, roadways, pipes, electrical cables, and a ventilation system allegedly used all parts of the mine for airflow.\(^{(117)}\) There is no hint as to whether *International Salt* may make non-mining uses of the cavity. These uses would be authorized if it had a defeasible fee in the cavity. Thus, the opinions provide no guidance as to whether *International Salt*, instead of Geostow, could dispose of incinerator ash in the mine without the consent of the surface owners.\(^{(118)}\)

What is surprising about *International Salt* is that the mining company won, despite the finding that it lacked fee ownership. The two parts of the analysis do not hang together -- indeed, they seem logically inconsistent. If the company lacks fee ownership, it should have only a servitude.\(^{(119)}\) The exclusive nature
of the rights of use and enjoyment does not necessarily imply more than a servitude; exclusive easements and exclusive profits are well recognized.\(^{(120)}\) If so, who has the possessory estate? It is a standard assumption of estates in land that the fee must be owned by someone, at all times. Thus, the surface owners (and Geostow as the successor to some of the tracts) must have fee title. This implies that the salt company's exclusive rights are limited in nature, perhaps only for uses connected to salt mining.\(^{(121)}\) Yet, neither court ever indicated that the surface owners had retained any present rights.\(^{(122)}\) One more puzzling feature of both International Salt opinions is their reliance on cases, including Lillibridge, Webber, and Moore, for awarding "exclusive rights" to the Company. These cases are inapposite, as they find fee title in the mining company.\(^{(123)}\)

How International Salt fits in with the estate and servitude theories of ownership and use of underground space is problematic. The only sure pronouncements are that transporting salt through underground passages that cross boundary lines is authorized and that the surface owners' storing of waste without the salt company's permission is not. Perhaps International Salt represents a hybrid position, where the salt company has greater rights than the Clayborn servitude but less than the defeasible fee theory.

Environmental groups perceived the International Salt outcome as a victory. However, as a practical matter, the litigation does not preclude use of parts of the Retsof Mine for waste disposal. In April 1993, the then mine owner applied for a permit from the New York Department of Environmental Conservation for a pilot program for ash disposal.\(^{(124)}\)

[6]--Concluding Remarks on Solid Minerals.

It is a close issue whether, for reasons of policy, the fee ownership theory or the servitude theory exemplified by Clayborn is the preferable base-line rule for vacated subterranean spaces. On balance, the servitude approach is better. When a deed simply grants or reserves coal or other minerals, with no express provisions bearing on ownership or use of underground spaces vacated by mineral extraction, fee ownership should remain with the non-mineral estate (the surface estate\(^{(125)}\)). The two prime policy concerns are the parties' presumed intent and efficiency of mineral operations. The surface estate, and not the mineral estate, is conceptually the greater interest. This is convincingly attested to by the well-accepted rule that the mineral estate, by implication, expires upon completion of mineral extraction. Because mineral production is the primary, if not sole, purpose that the parties had in mind and the Clayborn implied servitude is sufficient for mineral production, nothing more should be implied.

The only substantial argument to the contrary on presumed intent is stare decisis. Since Lillibridge established the fee ownership principle, parties to mineral conveyances should be presumed to know the law and, in the absence of evidence to the contrary, presumably intended the mineral owner to have fee ownership of vacated spaces. This argument concedes that the servitude rule is better, when viewed \textit{ab initio}, but argues that parties have relied on an established property rules. While this argument has some merit, ultimately it is unpersuasive for two reasons. First, many mineral deeds are drafted and signed without the surface owner retaining an attorney; thus, the presumption that the surface owner "knew the law" is usually suspect.\(^{(126)}\) Second, as the reported cases demonstrate, many mineral deeds expressly grant rights to use the subsurface (and often the surface) for transportation of adjacent minerals. The prevalence of these express provisions is a good reason for not implying those same rights. The express provisions demonstrate that mining companies are able to bargain for and document those rights. Due to their widespread use, the absence of such a clause from a given instrument should be given some weight in terms of presumed intent.

Promoting efficient mining practices is a policy argument against the servitude theory and in favor of the fee ownership theory. Because mineral deposits generally underlie many surface tracts, mining can proceed at
lower cost with consolidated operations. Taken to its logical conclusion, the efficiency rationale suggests that the fee simple absolute rule is preferable to the majority defeasible fee approach because the mineral owner is not compelled to leave some minerals in place under the subject tract in order to preserve ownership of the vacant space.

The efficiency concept also impacts the intent issue. When intent is ambiguous because the deed is silent on ownership of use of vacated spaces, we should presume that the parties intended that the mineral owner could operate in the most efficient manner possible. On the other hand, promoting efficiency at the expense of the parties' actual intent is not justified. If the landowner did not grant the mineral owner the most efficient package of rights possible, that is no reason for granting those rights by implication.

On balance, the prevalence of express rights to use underground spaces for transportation, coupled with the demonstrated ability of mineral grantees to bargain for those rights, suggests that efficiency does not justify the fee ownership principle. In modern mineral acquisitions, companies often expressly bargain for and obtain "community leases" permitting the mineral deposits to be exploited efficiently by a coordinated mining plan.\(^{(128)}\) The fee ownership rule treats neighboring mineral properties as a type of community lease for the limited purpose of subsurface transportation. The argument that communitization of neighboring properties should be done by implication when necessary to promote efficiency is not persuasive, either as a general matter or when limited to subsurface transportation.

There is one more reason to embrace the servitude theory. The analysis of rights to make non-mining uses of subterranean space, such as waste disposal, is clearer under the servitude theory than under the defeasible fee ownership theory. With the defeasible fee theory, the surface owner lacks the right to make these uses before the mineral has been exhausted and it is highly debatable whether the mineral owner has that right. With the servitude theory, on the other hand, the surface owner plainly has the right, at any time, to devote vacated spaces to non-mining uses, provided it does so without unreasonable interference with mining uses.

\section*{§ 4.03. Oil and Gas Storage Fields.}

Hydrocarbons are sometimes reinjected into reservoirs for storage, raising two related legal problems. Does the reinjecting owner lose title (or risk losing title) to the reinjected hydrocarbons? Who has the right to reinject hydrocarbons when the reservoir is owned by more than one person? If less than all owners agree to the reinjection plan, do any nonjoining owners have the right to block the program or to obtain compensation?\(^{(129)}\)

[1]--Ownership of Reinjected Hydrocarbons.


As to the first question, that of title, the state's theory of ownership prior to severance arguably makes a difference. In the classic case of \textit{Hammonds v. Central Kentucky Natural Gas Co.},\(^{(130)}\) the Company brought in natural gas from other fields and injected it into a vacated underground reservoir. The gas company leased most of the approximately 15,000 acre field. Hammonds, the owner of 54 acres of unleased land in the field, sued in trespass for damages. The Company won the case, but received bad news along with the good news. The court explained that there was no trespass because the gas company had lost title to the gas upon reinjection. To support this conclusion, the Kentucky court relied heavily on the \textit{ferae naturae}\(^{(131)}\) doctrine, which traditionally applies to wild animals. At common law, the landowner has a right to hunt wild animals while they remain on the owner's property, which right is superior to the claims of all other persons. When a wild animal, not yet reduced to the landowner's possession, roams elsewhere, the landowner loses all claim.
The *Hammonds* court analogized the mobility of wild animals to natural gas, focusing on its migratory nature. The oil and gas belong to the landowner "so long as they are on it or in it, or subject to his control; when they are gone, his title is gone."(132) The capturer of a wild animal acquires a "qualified property," which is lost if the animal escapes or otherwise returns to the wild.(133)

Reinjected natural gas might well be thought to be different from naturally occurring oil and gas that was never severed. For instance, on severance, produced gas becomes personal property. To rebut this argument, the *Hammonds* court pointed to Kentucky's theory of ownership of native oil and gas, under which "oil and gas are not the property of any one until reduced to actual possession by extraction."(134) Thus, loss of title to reinjected gas follows as a consequence of the non-ownership theory. Non-ownership in place applies as fully to reinjected hydrocarbons as it does to not-yet-produced hydrocarbons.

One other court accepted the *Hammonds* wild animal rule for reinjected hydrocarbons. In *Bezzi v. Hocker*,(135) the unit operator produced gas, which it processed to remove liquefiable hydrocarbons and then reinjected into the reservoir. Bezzi owned a term interest (for 20 years) in oil and gas, which expired after reinjection but before recovery and sale of the reinjected gas. She claimed a right to royalties from the production of reinjected gas on the theory that she had title to her share of the reinjected gas, which title was not lost by reinjection. Rejecting Bezzi's claim, the Tenth Circuit (applying Oklahoma law) held that the gas on reinjection became subject to the rule of capture and, thus, no royalties were due.

In contrast to *Hammonds*, the *Bezzi* court downplayed the wild animal analogy; it mentioned the *ferae naturae* doctrine only in quoting the trial court's opinion. Instead, the Tenth Circuit focused on the rule of capture as the key component to Oklahoma's theory of ownership of gas and oil in their natural state.(136) Implicitly, this means that the reinjected gas loses its character as personal property when reintroduced to the underground reservoir.

[**b**] --Modern rejection of *Hammonds*.

Several courts have rejected *Hammonds* and its progeny, holding that one who injects extraneous gas does not lose title to it. First, in *White v. New York State Natural Gas Corp.*, a federal district court (applying Pennsylvania law) ruled that the rule of capture applies only to the "original capture" of native gas and oil. Thus, an owner of a partial interest in proceeds from the sale of gas could not compel production of reinjected gas that was stored under the tract. The company reinjecting the gas did not lose title upon reinjection into the underground reservoir.

The court rejected the wild animal analogy for two reasons. First, unlike an escaped wild animal, there was no loss of control of the reinjected gas. The underground storage area was well-defined and subject to the control of the reinjecting company through the reinjection wells. Second, the situation was unlike the return of wild animals to their "natural habitat" because the stored gas, imported from the Southwest, differed materially in chemical and physical properties from the native gas.(138) Thus, the stored gas remained identifiable. For these reasons, although the use of the *ferae naturae* rule for oil and gas ownership originated in Pennsylvania during the last century,(139) the court believed that the state courts would not rigidly extend the analogy to all situations concerning title to gas and oil.

Texas also rejected *Hammonds* in the 1962 case, *Lone Star Gas Co. v. Murchison*. There, the plaintiff gas company injected natural gas into an underground reservoir pursuant to a unit operating agreement entered into by lessees and surface owners. Murchison leased adjoining, non-unitized land; drilled a well; and began producing stored gas. Lone Star sued for conversion of gas but the trial court dismissed the complaint, relying on *Hammonds* for the proposition that Lone Star had no title.
The Texas Court of Civil Appeals reversed, ruling that neither the *ferae naturae* doctrine nor the capture rule allowed Murchison to produce and sell the stored gas. The *Lone Star* opinion is significant in its reliance on the technology of reinjectment. The court rejected the wild animal analogy because it was based on a misunderstanding of the properties of oil and gas reservoirs. Modern science has proven the analogy false. Oil and gas do not freely migrate like wild animals. Instead, "oil and gas are inanimate, insentient, and move only in accordance with the physical laws of gravity and pressure. They are not `wandering and fugitive' but collect in reservoir traps where they almost invariably stay until man interferes with them."(141) For this reason, the court considered that natural gas, which became personal property on initial production, did not lose this character when reinjected.(142) In this sense, the gas more closely resembles a domesticated, not a wild, animal. "If a horse strays over on a neighbor's land, the neighbor may be entitled to damages, but he does not, by virtue of the trespass, acquire title to the horse."(143)

Finally, the *Lone Star* court, tersely and without explanation, rejected the notion that the rule of capture, which Texas applies to original production of gas, matters for cases of reinjection of gas.(144)

In 1987, Kentucky repudiated *Hammonds* in *Texas American Energy Corp. v Citizens Fidelity Bank & Trust Co.*(145) In a declaratory judgment action between a natural gas company and its secured lender, the Kentucky Supreme Court held that reinjected natural gas remains personal property for purposes of Article 9 of the Uniform Commercial Code. Accordingly, the court stated that stored gas cannot be encumbered by a real estate mortgage.(146)

The extent to which *Hammonds* is overruled is not crystal clear. The *Texas American* court adopted the opinion of the intermediate appellate court, which "narrowly construed or limited" *Hammonds* based on the control theory. Texas American had leased all the acreage of the storage fields, the fields had total integrity, and the company maintained exclusive control over them. In *Hammonds*, on the other hand, "there was a known `leak' in the gas storage reservoir inasmuch as Mrs. Hammonds' land was, in fact, a part of the natural reservoir, though not controlled by the storage company."(147) While the supreme court adopted this language, it went on to observe:

[W]hen previously extracted oil or gas is subsequently stored in underground reservoirs capable of being defined with certainty and the integrity of said reservoirs is capable of being maintained, title to such oil or gas is not lost and said minerals do not become subject to the rights of the owners of the surface above the storage fields.(148)

Many states have statutes that authorize public utilities to condemn depleted reservoirs for the storage of natural gas. Several of these statutes reject *Hammonds*, providing that reinjected hydrocarbons remain the property of the reinjecting company as against landowners whose interest in the reservoir is condemned or purchased.(149) In 1991, Oklahoma extended its statutory provision to cover landowners whose interests were not condemned or purchased.(150) Thus, Oklahoma has repudiated *Hammonds* and *Bezzi* by statute.

[c]--Summary.

At one time, it appeared that the underlying theory of ownership influenced the rule adopted for reinjected hydrocarbons. Kentucky (*Hammonds*) and Oklahoma (*Bezzi*) are "non-ownership" states and this theory carries forward whether the hydrocarbons at issue are native to the land or imported.(151) Pennsylvania and Texas, in contrast, are fee ownership states and, therefore, find no loss of ownership upon reinjection. This correlation, however, was destroyed by the Kentucky court's overruling of *Hammonds* in *Texas American* without formally making a change in the underlying definition of ownership in the natural state. Moreover, the attempt to explain the conflicting decisions on the basis of underlying theories is ultimately fruitless. The
rule of capture, which all courts apply to virgin hydrocarbons, is far more important than the conceptual
differences having to do with fee title.

The demise of *Hammonds* is not to be mourned. The decision simply cannot be justified by any cogent line
of reasoning. The only bona fide issue is one of identification. *Hammonds* can hold up to scrutiny only
when reinjected gas cannot be traced with reasonable certainty when produced by a neighboring well. As
legal critics have long pointed out, the analogy between wild animals and reinjected hydrocarbons is
foolishness. As a matter of geology and petroleum engineering, reinjected natural gas remains capable of
identification and measurement, even when the reservoir still contains some native (residue) gas.

The second question, whether the reinjecting natural gas company has committed a trespass because it does
not completely own the reservoir, is beside the point. This should have nothing to do with title, or
ownership. There is no general principle of property law that a trespasser forfeits property used in the
commission of the trespass. Rather, the victim is entitled to damages, injunctive relief, or both. Even when
the trespass is intentional, forfeiture is not the remedy. The only general exceptions are accession to
property (which does not apply because the reinjected gas is physically capable of removal) and the doctrine
of confusion. Confusion directly points back to the problem of identifiability. A wilful confuser of goods
may lose title to the commingled portion in order to protect the innocent owner, but this is only sanctioned
when it is not possible to determine the proportionate shares of the commingled property.\(^{(152)}\)

[2]--Rights to Use Reservoirs.

[a]--Vertical Neighbors.

Who has the right to use a depleted oil and gas reservoir for storage? The question has two parts. The first
involves vertical neighbors. After production has been completed, does the owner of the oil and gas rights
have the right to use the reservoir for reinjection? There are few reported cases on point. An old, discredited
Kentucky case awards storage rights to the mineral owner,\(^{(153)}\) and several commentators have endorsed
this position.\(^{(154)}\)

The other cases, however, unanimously favor the surface owner as the holder of gas storage rights. Neither
an oil and gas lessee\(^{(155)}\) nor an owner of a severed oil and gas interest\(^{(156)}\) has the right to use the vacant
reservoir for storage purposes.\(^{(157)}\) Owners of subsurface minerals have no implied rights to store
hydrocarbons in depleted reservoirs. Only the owner of the surface overlying the reservoir has this right.

Awarding gas storage rights to the surface owner is the better rule for policy reasons. Ordinarily, the parties
to the mineral severance contemplate production from the subject tract and, therefore, all other rights should
be retained in the surface estate. While this rule may seem to conflict with the rule for solid minerals, in
which the fee ownership theory confers the right to use the underground spaces to transport minerals from
adjacent tracts, these rules are reconcilable. Under the rule of capture, the producing oil and gas well, in
effect, uses the vacant spaces in the producing formation for the transportation of hydrocarbons from
neighboring tracts. Once the subject tract and the neighboring tracts are exhausted, the oil and gas rights
properly lapse. The surface owner or owners, thus, own the reunited estate, which includes the depleted
reservoir.

The situation is essentially the same for solid minerals under the prevailing rule that the mineral owner has
defeasible fee title to the vacated underground spaces. Clearly, when both the subject tract and the
neighboring tracts are exhausted of minerals, title to the underground space reverts to the surface owner.\(^{(158)}\)
The only distinction is the special case when minerals are exhausted from the subject tract or from one seam
in the subject tract, but remain in the neighboring tracts or in other seams. Courts differ as to whether title to
the underground space terminates or continues under this scenario. For the rule to parallel the oil and gas rule completely, the latter time for defeasance should be selected because oil and gas rights continue until the reservoir is depleted, regardless of where the hydrocarbons physically originate. However, a good argument can be made that the rules should not be totally parallel, in that the rule of capture does not apply to the production of solid minerals.

One problem concerns storage fields that are only partially only partially depleted at the time of reinjection. No cases are on point. Some decisions focus on evidence of total depletion, implying that this should matter. If the defeasible fee theory for solid minerals is applied by analogy, the mineral owner should have the implied right to reinject so long as native gas in commercial quantities remains in place. Such a rule, however, seems to present the substantial drawback of increasing the difficulty of determining when the native gas is, in fact, depleted. After reinjection, future withdrawals presumably will consist of a mix of stored and native gases. Because of this evidentiary problem, it may be preferable for courts not to create a separate rule for partially depleted reservoirs. If the owner of gas rights elects to store gas, a court should treat the reservoir as depleted for the purpose of allocating storage rights to the surface owners.

[b]--Horizontal Neighbors.

The second part to the question involves horizontal neighbors. As between neighboring surface owners over a common reservoir, must all agree to use of the reservoir to store reinjected gas? Or should there be something like a rule of capture "in reverse," which permits the first injector to appropriate the resource? Although the latter position has been endorsed, general principles of property law support the requirement that all surface owners must consent. Hammonds and its progeny found no such agreement necessary, but they were wrongly decided as well as badly reasoned. In principle, all surface owners overlying the depleted reservoir should be treated as cotenants. They were co-owners of the resource prior to and during the time of production; they still are co-owners of the resource. Principles such as pooling and unitization that protect neighboring owners during production also should protect the same group during reinjection processes. Otherwise, the practical problem of competing reinjection plans can arise.

Many states have condemnation statutes that permit gas companies to condemn storage rights in reservoirs. Federal legislation also authorizes condemnation for federally regulated storage fields. They promote an important public interest in securing adequate gas supplies. They are justified for the same reason that compulsory pooling and unitization regimes are justified -- to protect correlative rights, promote efficient production, and reduce waste. A surface owner's proportionate share of a reservoir suitable for reinjection should not be considered inalienable without the owner's consent. All co-owners should participate in the enterprise on an equal basis; for this reason, a forced sale is appropriate.

For gas storage programs, express rights should be obtained from the owners of all surface estates, together with an appropriate buffer to protect the reservoir. In general, reinjection agreements can be fashioned as long-term leases or as fee conveyances. As for other long-term mineral contracts and conveyances, care in drafting should be taken to define with specificity the agreements with respect to compensation and duration, as well as other matters of importance to the parties.

[3]--Waste Disposal.

Salt water often accumulates as an unwanted byproduct of oil and gas production. Its disposal in underground formations is a common practice. Unlike gas reinjection, which involves temporary storage of a valuable substance for future recovery, salt water is reinjected to get rid of it, with no plan for
future use. Typically, the salt water is injected into formations that already contain some salt water and are not capable of oil or gas production. Reinjected salt water migrates throughout the formation. The issue is whether the reinjecting company must acquire the property rights of neighboring owners to the formation, or whether it may proceed with the disposal plan solely on the basis of rights to the reinjection well and its site.

In *West Edmond Salt Water Disposal Association v. Rosecrans*,(170) the Oklahoma Supreme Court agreed with the oil companies, holding that neighboring landowners did not have an action in trespass or otherwise due to the migration of salt water under or into their properties. The neighboring owners attempted to recover damages based on the value to the oil companies of using the formation for salt water disposal. Rejecting this claim, the court focused on the absence of injury to the plaintiffs. The formation was already saturated with salt water and, while the operation forced reinjected salt water to migrate under their properties, all this did was to displace salt water that was already there.

The plaintiffs stressed that the oil companies were putting their waste on the plaintiffs' land. For this reason, the court discussed title to the reinjected salt water. The court, referring to the *ferae naturae* principle, said the salt water did not remain the property of the oil companies after injection. If the substance had value the plaintiffs had the right to drill a well and produce it.(171) In this context, the question of title seems irrelevant. Since the plan was permanent disposal, even if the oil companies could have retained title to the salt water, they intended to abandon both control and ownership upon reinjection.(172)

As a general principle, *West Edmond* is not correctly reasoned. This undoubtedly stems from the court's reliance on *Hammonds*. If an owner of the surface owns the formation or reservoir, that ownership should apply to both types of use, storage and waste disposal. If the surface owner has gas storage rights in the part of a depleted reservoir under her land, waste disposal rights should receive the same treatment. In both instances, the reservoir is expected to be contained, with the reinjected substance virtually certain not to escape where it is unwanted. The fact that, in one case the economic value to the injector is in later retrieval of the stored gas and, in the other case, the economic value is in letting the injected substance stay put should not be relevant. If the finding is credible that the injected salt water merely displaced other salt water under the plaintiff's property, with no increase in volume, *West Edmond* may be correctly decided on its particular facts.(173)

§ 4.04. Conclusion.

Scholars often like to say that oil and gas, due to its fugitive nature, is legally *sui generis* and that rules devised for solid minerals, wild animals, and other types of property have nothing to do with the fashioning of proper oil and gas law. Yet this position is overdone; law always grows by analogy, even when it struggles. The point is to distinguish good, useful analogies from misleading or dangerous ones. In this area of law, the gas storage cases have borrowed from the solid mineral cases.(174) As a result, the legal development exhibits general principles that apply to both solid minerals and fugacious minerals.

The defeasible fee theory for solid minerals and the allocation of gas storage rights to the surface estate are harmonious. The only distinctions are those that necessarily follow from the fact that the rule of capture applies to native gas but not solid minerals.

In both cases, the mineral owner may use vacated underground spaces to transport minerals from adjoining lands. For oil and gas, the capture principle means that, as pores in the producing formation open up, oil and gas from neighboring properties is transported across the subject tract as it flows to the well.(175)

In both cases, the mineral owner's rights to use the vacated underground spaces are defeasible. If the
instrument is silent as to duration, they expire upon exhaustion of the mineral, whether solid or fugacious minerals. This principle is sound because it comports with the parties' presumed intent. In some cases, this raises difficult questions of fact as to whether exhaustion has occurred,(176) but this cannot be avoided.

In both cases, the mineral owner's rights to use the vacated underground spaces for purposes unrelated to mineral production are circumscribed. In the solid mineral context, this means waste disposal should not be permitted without the consent of the surface owners. For gas reinjection programs, storage rights must be obtained from the surface owners. For injection of liquid waste, such as salt water, storage or disposal rights should, in principle, be obtained from surface owners.

1. * I am very grateful to Richard Faulkner, J.D. 1993, University of Georgia, for his highly capable research assistance.

2. 1. Occasionally disputes arise between surface neighbors who own complete estates. The prime examples are reinjection of natural gas and implied transportation easements when a working mine is subdivided.

3. 2. The only substantial exceptions are oral contracts that are validated by the part performance doctrine and oral licenses that become irrevocable due to estoppel. Both instances are rare in mineral extraction.

4. 3. The distinction between mineral grants and mineral reservations is important because there are several canons of construction that treat the two transactions differently. In general, the mineral grant is more likely than the mineral reservation to be construed in favor of the mineral owner. See, e.g., Kormuth v. United States Steel Corp., 108 A.2d 907 (Pa. 1954) (construing coal deed against grantor to give grantee implied transportation rights greater than express rights), cert denied, 349 U.S. 911 (1955).


6. 5. This theory treats the mineral rights as a true "estate," with generally the same legal characteristics as a surface estate in land. Blackacre above ground is no different from Blackacre below ground.

7. 6. In rejecting the ad inferos maxim, the court in Hinman v. Pacific Air Transport, 84 F.2d 755, 758 (9th Cir. 1936), explained:

We think it is not the law, and never was the law. . . . When it is said that man owns, or may own, to the heavens, that merely means that no one can acquire a right to the space above him that will limit him in whatever use he can make of it as a part of his enjoyment of the land. To this extent his title is paramount. No other person can acquire any title or exclusive right to any space above him.

8. 7. For example, unlimited possessory ownership of airspace would imply that zoning laws imposing height limits on buildings and structures are physical takings of property under the Just Compensation Clause of the federal Constitution. U.S. Const., amend. V. Moreover, this absolute a view of airspace ownership also could have jeopardized the right to transmit radio and television broadcast signals.


10. 9. See text, infra, at § 4.02[1][a].

11. 10. See Restatement (Second) of Torts § 159 cmt. e (1966); W. Prosser & P. Keeton, Law of Torts § 13 at 82 (5th ed. 1984).

12. 11. Strictly speaking, the surface owner cannot have a servitude in the minerals because a servitude requires a minimum of two owners -- one who owns the servient estate and one who owns the servitude. This is embodied by the precept "a person cannot own an easement in her own land" and the merger doctrine, which extinguishes an easement when there is unity of title of the servient and dominant estates. Thus, it is sometimes said that the surface owner who has mineral rights has an interest in the nature of a servitude or profit.

13. 12. Typically, the reason for this sleight of hand is to solve a procedural problem, such as permitting the victim of a subsurface trespass to plead tortious dispossession of the underground substance.
13. See W.P. Shipley, Annotation, *Grant, reservation, or exception as creating separate and independent legal estate in solid minerals or as passing only incorporeal privilege or license*, 66 A.L.R.2d 978 (1959).

14. After severance, oil and gas, like other minerals and substances, are treated as personal property.

15. The *ad inferos* maxim posed the same problem for groundwater withdrawals. Water wells deplete the neighbor's share of the aquifer whenever the water pumping rate exceeds the recharge rate.


19. Proponents of the fee ownership theory for oil and gas usually ignore this problem. Occasionally, the awkward explanation that the owner really has a "determinable fee" is given. See, e.g., Lone Star Gas Co. v. Murchison, 353 S.W.2d 870, 880 (Tex. Int. App. Ct. 1962).


21. Williams & Meyers identify a third position called qualified ownership; however, they concede that there are no relevant differences between a "qualified ownership" state and a "non-ownership" state. 1 H.R. Williams & C.J. Meyers, *Oil & Gas Law* § 203.2 (1992).


23. *Id.* at 25; Hammonds v. Central Ky. Nat. Gas Co., 75 S.W.2d 204 (Ky. 1934).

24. Calling this view the "non-ownership" theory is a misnomer. Private property in oil and gas in place is still recognized -- the owner simply has a servitude rather than a fee estate in substance.

25. The practical differences between the two theories are minor. However, there is an impact with respect to reinjection plans. See text, *infra*, at § 4.03. Other areas where the theoretical differences sometimes produce tangible impact are abandonment, adverse possession, marketable title acts, and dormant mineral interest acts.

26. The prime example is those statutes that dispense with the common law rule requiring the use of words of inheritance to convey a fee simple estate. They clearly assume a fee simple absolute when a possessory estate is granted by an instrument that is silent or ambiguous as to duration; however, they leave unclear the treatment of servitudes when a clear expression of durational intent is absent.


29. See Aggregate Supply Co. v. Sewell, 122 S.E.2d 580 (Ga. 1961) (right to remove sand and gravel not subject to termination by abandonment).

30. For example, if the servitude is transferred to a corporation that owns the surface estate and, later, the corporation makes a general conveyance of mineral assets to another entity, the merged mineral servitude may be omitted.

31. Merger, of course, does not apply when neighboring surface estates come under single ownership; separate titles persist. Logically, it should not apply to a transfer that unifies a mineral estate with its overlying surface estate.
1. The defeasible fee simple could, in principle, be considered either a fee simple determinable, automatically reverting to the grantor or her successors upon exhaustion of the resource, or a fee simple subject to a condition subsequent, giving the grantor or her successors a power of termination when the resource has been exhausted. Case authority has tended to use "determinable" terminology. The distinctions between the two types of defeasible fees are not of major importance for the problems associated with the ownership of vacant subterranean spaces.

34. 22 A. 1035 (Pa. 1891).

35. There was no published dissenting opinion.

36. Lillibridge, 22 A. at 1037.

37. The habendum clause of the deed granted the coal to the grantee "to have and to hold the coal in and under said land unto the party of the second part, its successors and assigns, until the exhaustion thereof under the terms of this indenture." Lillibridge, 143 Pa. at 294. While the court never discussed the significance of this provision, it did note that the defendant had not yet exhausted all the coal from the underground space. Thus, arguably, the judicial statements that the company "absolutely" owned the estate in the vacant spaces were dictum.

38. E.g., Eardley v. Granville, 3 Ch. Div. 826 (1876); Proud v. Bates, 34 L.J. Ch. 406 (1865).

39. Lillibridge exemplifies the surprisingly ingrained nineteenth century American judicial practice of keenly studying, and often adopting, post-revolutionary English cases.

Lillibridge describes the nineteenth-century English mining cases as uniformly giving the mineral owner an absolute fee in tunnels and containing chambers. Those cases do attach this consequence to grants and exceptions of "mines," whether open or unopened. However, the English cases sharply distinguish grants and exceptions of "minerals," pursuant to which the mineral owner obtains no interest in the tunnel, space, shell, or containing chamber. E.g., Eardley v. Granville, 3 Ch. Div. 826, 834-35 (1976) (grantor who excepts mines "severs his estate vertically," retaining ownership of mineral stratum both before and after mineral extraction; grantor who owns "merely the minerals" has no property in stratum after mineral extraction). See R.F. MacSwinney, The Law of Mines, Quarries, and Minerals 67-68 (1884) (treatise describing both types of conveyances, which Lillibridge quotes extensively but without reference to second possibility).

The modern English rule has not changed since the last century: "If the ownership of the mines is severed from that of the surface, the owner of the mines has absolute powers of using as he may think fit the empty space from which minerals have been worked . . . . If the ownership of minerals only is severed, the owner of the minerals has no power to use the empty space except for the purpose of getting the remaining minerals." Lord Hailsham, 31 Halsbury's Laws of England ¶ 269 (4th ed. 1980).

Under the English rules that Lillibridge purports to apply, the case may be wrongly decided. The question is whether the grant conveyed "mines of coal," or only the coal itself (i.e., minerals). Lillibridge does not describe the deed in detail, mentioning only that it conveyed "all the merchantable coal." This expression seems closer to a conveyance of minerals than a conveyance of mines or the mineral strata.

40. The general rule is that the mineral owner has no implied right to use any part of the surface for the transportation of minerals from other properties. See, e.g., Fisher v. West Va. Coal & Transp. Co., 73 S.E.2d 633 (W. Va. 1952) (absent contract right, no part of surface may be used for transporting and processing coal from adjoining lands); W.C. Crais, Annotation, Right of owner of title to or interest in minerals under one tract to use surface, or underground passages, in connection with mining other tract, 83 A.L.R.2d 665 (1962).

41. Lillibridge, 22 A. at 1037:

The tunnel or way is cut through a vein of coal, 200 feet below the surface . . . . They have no access to it; they cannot use it; they are in no manner obstructed or injured by it. . . . They ask to enjoin removing that coal through the chamber or way made by the defendant through its own property, to-wit, the coal sold to them by the plaintiffs. Why or for what reason should we do this? The plaintiffs would gain nothing which they do not now have, if we did.

42. Since the injunction would not benefit Lillibridge in any way, the only apparent reason he brought the action was to stop the coal company's operation until it agreed to pay enough money in the form of "wheelage" or the like. There is great similarity between this part of the Lillibridge analysis and the dissenting opinion in the famous case of Edwards v. Sims, 24 S.W.2d 619, 621 (Ky. 1934)
(Logan, J., dissenting), where Judge Logan argued that a landowner whose surface overlays a cave, but who has no cave entrance, should have no property right as against a neighboring cave proprietor who developed the cave as a tourist attraction.

43. 11. 91 N.E. 475 (Ill. 1910).

44. 12. Id. at 479 (citations omitted).

45. 13. 98 N.E. 945 (Ill. 1912). Schobert is apparently the only case since Lillibridge to follow the broad fee simple absolute view of ownership of space vacated by coal mining.

46. 14. Id. at 947. The court also relied on a prior Illinois case, Consolidated Coal Co. v. Schmisseur, 25 N.E. 795 (Ill. 1890), in which a lessor of 159 acres of coal also leased 11 surface acres for 35 years or until the coal was "sooner exhausted." The company located entries and openings on the leased acres and mined coal from both the leased tract and an adjacent 100 acres. The surface owner challenged the use of both the underground passageways and the leased surface for transporting the other coal. On the first issue, the court held for the coal company because the lease had no express use restrictions. On the second, the company won because it was "rightfully in possession" of the mine and the surface owner had "no right of re-entry" in the mine until the lease expired.

47. 15. In this respect, an A.L.R. annotation misdescribes Schobert, claiming that "all the coal underlying the tract in dispute had been exhausted." W.E. Crais, Annotation, Right of owner of title to or interest in minerals under 1 tract to use surface, or underground passages, in connection with mining other tract, 83 A.L.R.2d 665, 687 (1962). The plaintiff claimed that when "coal was removed" the vacated space became the grantor's property. 98 N.E.2d at 946. Yet, from the other facts in the opinion, it is clear that the plaintiff did not mean all the coal, but only that ownership reverted on a proportional basis.

Schobert is one case where a remedy may have been easy to fashion, had the court found a right in the surface owner. The coal company owned tracts adjacent to Schobert's 59 acres, and bought 1 acre of coal from Schobert's coal grantee for the purpose of creating a passage to mine its tracts. Schobert asked for an accounting for the profits obtained by the seller of the 1 acre.

Not only was the coal from the 1 acre, through which the passage was cut, not exhausted, but coal also remained under the remainder of Schobert's 59 acres. When exhaustion or depletion of the resource is relevant to the duration of ownership of underground spaces, subdivision of the mineral estate should not be considered in evaluating the rights of the surface grantor of the whole tract.

48. 16. 48 N.E.2d 400 (Ill. 1943).

49. 17. Id. at 405. The court does not cite Attebery and it is unclear whether this cryptic limitation is solely durational (conforming to the defeasible fee simple theory) or also limits the passageways to coal from the subject tract (conforming to the Clayborn servitude theory described in the text, infra, at § 4.02[3][a]).

50. 18. The fee simple absolute theory raises the policy concern of whether the mineral estate will ever lapse, resulting in reunification of subterranean ownership with the surface estate. If not, severe title problems may result when the deposit or resource on adjoining or nearby tracts is completely depleted. If the company no longer uses the space, continued separate ownership of the space is a cloud on title. This problem might be solved by an expansive application of adverse possession principles, but this could prove difficult and cumbersome.

51. 19. Leaving aside the question of feasibility, uses such as a subway line for a passenger train, an arsenal, and a food storage facility are permissible in principle, provided they are located within the mineral strata.

52. 20. Subjacent support is one example. In addition, when strata are separately owned, the owner of the lower strata has an implied right of access through the upper strata. See Chartiers Block Coal Co. v. Mellon, 25 A. 597 (Pa. 1893) (surface owner who granted fee estate in coal has implied right to drill oil and gas well through coal vein).

53. 21. See text, infra, at § 4.02[2][a].

54. 22. See text, infra, at § 4.02[3][b].

55. 23. However, the surface owner would normally have the implied right of support from the subsurface estate.

56. 24. In some states, such as Illinois and Texas, it is common to find deeds that expressly grant or except the "surface estate."
Query: Do these deeds, when they have no other relevant language, create a fee simple absolute in the subsurface generally or merely a mineral estate that expires upon exhaustion of minerals?

57. 25. 42 A. 4 (Pa. 1899) (just as in Lillibridge, deed conveyed "all the merchantable coal").

58. 26. Id. at 5. Webber's reinterpretation of Lillibridge may be justified due to the express limitation in the habendum clause in that case. See, supra, at §4.02[1][a] n. 5. Ironically, the Webber opinion does not refer to any express durational limitation in the deed it construes. Thus, if the deeds should bear different interpretations, the two cases should come out the other way: a defeasible fee to the vacant space in Lillibridge, but a fee simple absolute in Webber.

59. 27. United States Steel Corp. v. Hoge, 468 A.2d 1380, 1384 (Pa. 1983) (holding that coalbed gas or methane belongs to owner of fee estate in coal, not to surface owner who reserves right to "drill and operate through said coal for oil and gas"). For detailed discussion of Hoge, see B. Burke, "Recent Cases Relating to Coal Properties," 5 Eastern Min. L. Inst. § 4.03[1] (1984).

The post-Webber Pennsylvania decisions have applied the basic principles, without changing them, to the particular language used in mineral deeds. Generally, the coal owner has the benefit of the implied fee simple determinable even when the deed grants an express right of way to transport coal from adjoining properties that is narrower in scope. See Kormuth v. United States Steel Co., 108 A.2d 907 (Pa. 1954), cert. denied, 349 U.S. 911 (1955) (deed expressly granted underground right of way to haul other coal owned by grantee; right to haul non-owned coal from adjoining tract permitted because grantee's successor has fee title to passageway); Shawville Coal Co. v. Menard, 421 A.2d 1099 (Pa. Int. App. Ct. 1980) (deed with coal reservation also expressly reserved right to transport grantee's other coal from other lands upon and under surface of conveyed tract; subsequent deed by coal owner could have divided right to transport coal, with grantor and grantee permitted to exercise "wheelage" rights jointly).

60. 28. 80 N.E. 6 (Ohio 1907).

61. 29. Id. at 8. "It results from the absolute proprietorship over the mineral in place, that the owner thereof has a like interest in the containing chamber until the termination of the estate." Id.

62. 30. The court noted that such coal ownership would be worthless if the owner had no right to remove part of the surrounding strata to create headroom, make the mine safe, and provide space for drainage. Id. at 7-8.

63. 31. See Bagley v. Republic Iron & Steel Co., 69 So. 17 (Ala. 1915) (coal owner has right to possession of haulway, may use it to haul coal from other lands); Goodson v. Comet Coal Co., 31 S.W.2d 293 (Ark. 1930) (owner of coal in place has right to use passages for all purposes, including transporting coal from other lands, until coal is exhausted); Middleton v. Harlan-Wallins Coal Corp., 66 S.W.2d 30 (Ky. 1933) (so long as mineral is in place, mineral owner can use passages and openings for all lawful purposes); Fisher v. West Va. Coal & Transp. Co., 73 S.E.2d 633 (W. Va. 1952) (fee owner and its lessee have right to transport coal from adjoining lands so long as coal under subject tract is not exhausted or abandoned). These courts have not endeavored to explain the nature of the ownership rights involved. See also W.C. Crais, Annotation, Right of owner of title to or interest in minerals under one tract to use surface, or underground passages, in connection with mining other tract, 83 A.L.R.2d 665 (1962).

64. 32. Webber, 42 A. at 5.

While the purchaser of the coal was in good faith mining out his coal, his right to the use of the space made vacant by his workings as they progressed could not be successfully obstructed by the owner of the surface. . . . The surface owner has a right to the reversion of the space occupied by the coal within a time contemplated by the parties when they sever the coal estate.

65. 33. 103 A. 539 (Pa. 1918).

66. 34. The defendant had completed a first mining of Westerman's tract in 1908, so the "temporary" suspension had lasted 10 years before the supreme court decision. To support the surface, about 25% to 30% of the coal had been left in place. Second, mining would eliminate the passageway and cause surface subsidence. Under Westerman, when modern coal mining regulations prohibit surface subsidence, it appears that the coal owner's right to use vacated under-ground spaces terminate by operation of law.

Westerman also raised the issue of how to treat mineral exhaustion when the mineral estate contains more than one strata or deposit. The coal included 4 veins; only the upper vein was then being mined. The court observed: "This passageway cannot be used in mining the coal in the lower veins. . . . [D]efendant's right in plaintiff's farm will terminate as soon as the mineable coal therein has been removed; and the right in the upper vein will cease when all of such coal has been taken therefrom." Id. at 539-41. Contra Robinson v. Wheeling Steel & Iron Co., 129 S.E. 311 (W. Va. 1925) (mineral owner who completely mined and removed one coal
seam has right to use passages through that seam to transport coal from other lands due to continued ownership of minerals and ores above and below mined coal seam); see J.W. Simonton, Note, "Rights of Fee Simple Owner of Subjacent Mineral Stratum in the Containing Space," 32 W. Va. L.Q. 242 (1926) (arguing servitude theory is generally preferable to fee ownership theory for vacated underground spaces, but that Robinson may be correctly decided because the deed was reasonably interpreted as expressly granting fee title to underground space).

67. 35. 73 S.E.2d 633 (W. Va. 1952).

68. 36. Id. at 639.

69. 37. Id. at 640. In dissent, Judge Given argued that the company should not be permitted to mine the distant tracts first because that interfered with the surface owners' expectations of a reversion of the subterranean space and diminished the surface owners' property rights, as set forth in their deed, based on "modern and approved practices." Id. at 643-44.

70. 38. For a discussion of express and implied duties to mine, see C.A. Fox, jr. & M.J. Hackett, "Implied Obligations to Mine," 7 Eastern Min. L. Inst. ch. 4 (1986) -- Ed.

71. 39. While the owner of a present estate owes a duty not to commit waste, there is no obligation to take action to cause the present estate to terminate promptly. Compare, for example, a conveyance of land "so long as it is used for farm purposes." Even when the land becomes more economically valuable for a use other than farming, the owner has no duty to convert to that other use so as to cause the future interest to become possessory.

72. 40. This is true to some extent even under the majority position in Fisher. The mineral owner still has to worry about whether the fact finder will conclude that the suspension of mining is "temporary" rather than long-term and whether the suspension is compatible with the fact finder's notion of "modern and approved practices."

See also R.T. Donley, "Use of the Containing Space after the Removal of Subsurface Minerals," 55 W. Va. L.Q. 202 (1952-53) (arguing Fisher is incorrect if due diligence has any teeth to it; coal owner should have right to use passages to remove adjoining coal until coal under subject tract is exhausted, with no implied duty to mine and with the privilege of suspending coal mining indefinitely).

73. 41. See J.W. Simonton, Note, "Rights of Fee Simple Owner of Subjacent Mineral Stratum in the Containing Space," 32 W. Va. L.Q. 242, 246 (1926). Today, courts would probably abandon "the logic of the theory" and refuse to permit uses such as placing tunnel for railroad track in mine.

74. 42. 105 S.E. 117 (Va. 1920).

75. 43. The deed conveyed "all the coal on, in or under' the land `with the right to mine and remove'" the coal. 105 S.E. at 117.

76. 44. 105 S.E. at 119. Clayborn also cited several of the English authorities as supporting the fee ownership theory. Id. The Clayborn court did not realize that England actually has two rules, depending upon how the deed is interpreted. Clayborn's holding follows the English rule when the deed is construed to convey the minerals, but not the mine or seam or seam are conveyed. See, supra, § 4.02[1][a] at nn. 6 & 7.

77. 45. Thus, the majority fee ownership rule and the Clayborn rule agree as to ownership of the coal in place; they differ only as to the nature of the ownership of the space vacated by coal mining.


79. 47. 105 S.E. at 120. To complete the analogy, the court noted that the timber purchaser has an implied easement to use the land surface to remove the cut timber, but cannot use that easement to haul timber from adjoining tracts. Id.

80. 48. Id. at 119. "[I]f both are reasonably necessary [they are] always implied in the deed for the coal, and yet the unmistakable result of the authorities . . . is that mining operations on the surface must be confined to the coal on the particular tract." Id.

The fact that the coal company removed rock from the stratum underlying the coal, placing its track on the substratum, is not relevant.
The court's analysis clearly leads to the same result had the defendant cut a tunnel that left surrounding coal both above and below. Although a rule could be fashioned that confers possessory rights to vacated space only strictly within the confines of the mineral deposit, the cases are not reconcilable on this basis. Moreover, there is no sound policy reason for such a distinction because prudent mining practices inevitably necessitate use and partial removal of at least some non-mineral substances, at least for shafts. See text, supra, at § 4.02[2][a].

81. 49. 105 S.E. at 121. The court described this nonpossessory interest using the old tongue-twister "incorporeal hereditament." Id. at 120. Basically, this means invisible real property that is capable of inheritance. See Black's Law Dictionary 726 (6th ed. 1990).

82. 50. Transportation rights under the servitude theory have the same maximum duration as under the defeasible fee theory -- until exhaustion of the mineral resource. They are different, however, in that the servitude theory implies partial termination, as vacated spaces become no longer reasonably necessary, while the defeasible fee theory operates as a one-time reversion of the entire estate -- ownership of all vacated space continues in the mineral owner until the mineral estate itself ends.

83. 51. The coal company had also used a surface path across Clayborn's land for workers and equipment to go back and forth between the tracts on either side of Clayborn's in connection with mining operations on those adjacent tracts. The court enjoined the company from using the surface path for purposes other than mining Clayborn's coal. 105 S.E. at 123.

84. 52. Prior to the coal company's completion of the underground tunnel, it had paid 10¢ per ton to transport coal from the adjacent tract across a surface route on Clayborn's land. Quite possibly Clayborn sought compensatory damages on this basis.

85. 53. The court applied the normal easement rule that the easement owner cannot use an appurtenant easement to benefit non-dominant land, even if the intensity of use does not increase.

[N]o substantial pecuniary damage is being done to [the surface owners] by the use of the tunnel. The same might be said of many other rights of way. A landowner might grant a right of way though his land to haul timber from that land and the grantee might be able to bring over that right of way timber from an adjoining tract without doing any additional damage, and yet nobody would question the right of the landowner to prohibit and enjoin such additional use of the way.

105 S.E. at 122.

One judge dissented in Clayborn, preferring the fee ownership theory for reasons of practicality and efficiency. Because a coal seam frequently extends under many different surface tracts, "to require a separate opening or tunnel upon each tract of land for the removal of so much of the seam as underlies that tract would so increase the expense of mining coal as to depreciate its value." 105 S.E. at 123 (Prentis, J., dissenting).


87. 55. "The provisions of this section shall not affect contractual obligations and agreements entered into prior to July 1, 1981." Va. Code. Ann. § 55-154.2. While this effective date provision does not mention "deeds," as does the first sentence of the statute, the apparent intent is that deeds delivered prior to this date, as well as prior agreements between mineral owners and surface owners, are not subject to the statutory presumption.

88. 56. To date, there are no reported appellate cases construing the statute. Given the effective date provision, this is not surprising.

89. 57. Reading the statute literally, the presumption arises only if the deed does not "otherwise provide." Thus express deed provisions that are inconsistent with the mineral owner taking title to the underground spaces do not rebut the presumption; it prevents it from ever arising. Conceivably, the legislature may have intended, rather than a true presumption, the legal oxymoron known as a "conclusive presumption." See also, Va. Code Ann. § 55-154.1 (1986 & Supp. 1992) (repealed) (immediately preceding provision in codification, dealing with mineral rights to migratory gases, uses term "conclusively presumed" in allocating property right to surface owner).


93. 61. In this context, although one should not make too much of codification formats, it may be relevant that the legislature decided to make Va. Code Ann. § 55-154.2 part of the chapter that deals with removing clouds on title.

94. 62. This rule would not give all surface owners the right to compensation. On an individual basis, the court would have to decide whether or not the deed granted the mineral owner the right to use underground spaces for transportation without further compensation.

95. 63. A good question is how to measure the damages or compensation. Should we look at actual damage to the surface estate or to the value of the transportation rights exercised by the mineral owner? If there is no surface damage, should any damages be awarded? While there are cogent arguments that there should be no compensation in the absence of surface harm, the overall thrust in analogous areas of the law of remedies is to let the property owner select the measurement rule -- either what the plaintiff has lost or what the defendant has gained.

96. 64. If the surface owner is entitled to damages, then the two parties both own interests in the underground space. The mineral owner essentially has a right to purchase the space for the benefit of nearby mineral operations -- a forced sale that has some analogies to the power of condemnation. A significant weakness in this approach is that it renders the parties' statutory rights much less certain, increasing the likelihood of litigation.


98. 66. Corona Coal Co. v. Hendon, 94 So. 527 (Ala. 1922) (lease made for purpose of mining and removing "all the coal [from the leased tract] and for no other purpose" does not permit lessee to transport coal from adjoining lands through underground haulways); Bagley v. Republic Iron & Steel Co., 69 So. 17 (Ala. 1915) (stating fee owner of coal in place, but not lessee or licensee, may use passages to mine adjacent coal).

99. 67. Quality Excelsior Coal Co. v. Reeves, 177 S.W.2d 728 (Ark. 1944) (no implied right to remove coal from other lands because lease is not sale of coal in place, but only conveys right to mine and remove coal; lessee's argument that damage was nominal rejected; damages equal to "haulage royalty" based on fair rental value of passageway awarded; conditional injunction that permitted further hauling of coal from other lands, provided lessee paid haulage royalty awarded); Quality Coal Co. v. Guthrie, 157 S.W.2d 756 (Ark. 1942) (awarding damages and terminating lease for unauthorized hauling of coal from adjacent tracts).

100. 68. E.g., Consolidated Coal Co. v. Schmisseur, 25 N.E. 795 (Ill. 1890) (coal lessee permitted to transport coal from adjoining tract through underground passages because lessee rightfully possessed mine; surface owner had right of re-entry only upon lease expiration); New York & Pittston Coal Co. v. Hillside Coal & Iron Co., 74 A. 26 (Pa. 1909) (lessee has right to use underground gangway to transport coal from other properties, citing Lillibridge and Webber).

101. 69. 80 N.E. 6 (Ohio 1907).

102. 70. "The creation of a separate interest in the mineral with the right to remove the same, whether by deed, grant, lease, reservation, or exception, unless expressly restricted, confers upon the owner of the mineral a fee-simple estate, which is of course determinable upon the exhaustion of the mine." 80 N.E. at 6 (emphasis added). This characterization is logically inconsistent. A lessee owns a leasehold (a non-freehold estate), not a fee simple. The court should have said, as to the lease, that the leasehold terminates upon exhaustion of the resource. At any rate, the Moore statement is dictum, as the case involves two grants of coal in fee simple and no lease transaction.

103. 71. 168 S.W.2d 366 (Ky. 1943) (lessee must mine within reasonable period of time when lease provides for payment of royalties; lessee has right to use underground passages for removing coal from other lands until expiration of reasonable time to mine leased tract).

104. 72. The same issue may arise when the coal lease is given, not by the surface owner as lessor, but by the owner of a severed fee estate in the coal as lessor. When the lease is silent on the topic, it is not clear whether the coal lessor or coal lessee has the right to use vacated spaces. However, in this situation the surface owner has no reason to complain if the coal lessee is transporting coal from adjacent tracts. See Fisher v. West Va. Coal & Transp. Co., 73 S.E.2d 633 (W. Va. 1952) (in challenge by surface owner, lessee from coal owner had same right to transport adjoining coal as lessor; lessee stands in shoes of lessor in this context).
105. 73. This highly formalistic view tracks the Lillibridge opinion. See text, supra, at § 4.02[1][a].

106. 74. Mineral leases (including oil and gas leases) are so unlike surface leases that it is unfortunate that they are called "leases" at all. This choice of form, which carries the implication that normal landlord-tenant rules might readily apply, has impeded analysis. In actuality, mineral leases are sales, or conditional sales, of the substance in place. [For another view, see C.W. Armstrong & D.B. Dixon, "Dollar-Related Clauses in Coal Leases," 2 Eastern Min. L. Inst. §§ 9.03 & 9.04 (1981) -- Ed.]

107. 75. For example, the Guthrie court ruled that a mineral lease does not ordinarily convey title to the coal in place but it carefully studied the lease clauses to find that no title was transferred expressly or by necessary implication. Quality Coal v. Guthrie, 157 S.W.2d 756 (Ark. 1942).

This test raises the problem of distinguishing "true leases" from those leases under which the lessee's rights are sufficiently extensive to approximate fee ownership. See D.H. Vish, "Private Coal Leases," 6 Eastern Min. L. Inst. § 2.02[1] (1985). The clearest, most extreme example of the later category is a mineral lease having a perpetual (or potentially perpetual) duration with the consideration paid in advance, except for nominal rents.


109. 77. The chamber is in a horizontal seam 1,060 feet below the surface, extending for miles in all directions. With use of the room and pillar method, about 3/8th of the salt remains in place in the pillars, floor, and ceiling.

110. 78. The deeds are excerpted in an appendix to the district court opinion. 697 F. Supp. 1258, 1270.

111. 79. 878 F.2d at 574 (endorsing district court's use of principle of nosciitur a sociis to decide "mines" was just another way of describing salt beds). This ruling appears reasonably debatable, given the repeated references in the deeds to conveys "forever" and access rights that are "permanent." See 697 F. Supp. at 1270-74. As is true for all close cases, rules of construction exist that may be employed to justify the contrary result. E.g., ambiguous conveyances should be construed against the grantor (here the surface owner), and constructions should be avoided that read a word out of the instrument (if "mines of salt" means the same as "beds of salt," why did the parties use both terms?).

Under the English line of decisions, the deeds in International Salt would be interpreted as conveying a fee simple absolute in the containing chamber, notwithstanding the fact that the mines were not open when the deeds were made. See, supra, § 4.01[1][a] at nn. 6-7.

112. 80. Exhaustion means that no "mineable" or "recoverable" minerals remain in place. 878 F.2d at 575 (relying on Westerman). The trial court disposed of both issues by summary judgment.

113. 81. 697 F. Supp. at 1260.

114. 82. There is a credible counter-argument that separate beds, veins, or seams should be considered separate properties for purposes of mineral exhaustion. If all the commercially minable salt is gone from the one discrete bed, why shouldn't that vacated space revert to the surface? Where the lowest bed is mined first, why does the mineral owner need that space? Where, as in International Salt, there is a lower unmined bed, the mineral owner will have a vertical access easement for shafts or similar entries through the vacated, mined bed. This easement is no different than a mineral owner's implied right to remove soil and rock to reach the deposit from the surface.

Geostow raised this point, citing language in Westerman. The Second Circuit, however, distinguished Westerman on the basis that the passageway in the upper coal vein, as a factual matter, could not be used to mine the coal in the lower veins, but the excavation cavity in the Retsof Mine could be used "for access to" the lower beds of salt. 878 F.2d at 576-77. This distinction is unpersuasive because a vertical access easement through the upper bed is sufficient.

115. 83. Geostow argued that the salt was exhausted in the "mined-out" sections because "present day mining technology and economics" cannot justify further extraction. Rejecting this position, the district court pointed to the Company's fee simple interest in the salt, the absence of express time limitations (there is no "implied duty of speedy development"), and the company's right to employ mining methods not "in vogue" when the deeds were given. 697 F. Supp. at 1269-1270. If the district court is right, this would mean that a fee simple mineral estate never reverts when there is any mineral remaining. It is always possible to hypothesize that technological breakthroughs, coupled with dramatically rising mineral prices, will justify remining operations at some distant
point in the future. The Second Circuit did not mention this part of the district court's reasoning and its discussion of exhaustion seems to focus on salt that is presently recoverable. 878 F.2d at 575-76.

Second, the district court relied, to some extent, on the fact that the containing chamber lies completely within the salt bed, rather than encroaching upon the surrounding strata. See, supra, § 4.02[5] at n. 77. This distinction should not be material, see text supra, at §§ 4.02[2][a] n. 30 and 4.02[3][a] n. 48, yet the circuit court did not mention it.

116. 84. 697 F. Supp. at 1268; 878 F.2d at 575.

117. 85. 878 F.2d at 572. However, Geostow apparently did not concede this point, seemingly making it an issue of material fact not to be adjudicated in the summary judgment proceeding. Thus, International Salt's exclusive right to all of the cavity may not depend upon present reasonable use in fact of all of the cavity; future potential use might suffice.

118. 86. Since this issue was not raised by either party, there is nothing wrong with the court's silence on this point. Far too many reported opinions waste ink on dicta that is unnecessary to resolve the matter at hand. Whatever imprecision there is as to International Salt's "exclusive rights" in other contexts, clearly they preclude Geostow's waste disposal plans.

119. 87. The ruling that International Salt lacks fee title to the containing chamber resembles Clayborn in some respects, although neither the district nor circuit court cites Clayborn. While the International Salt courts did not identify the company's exclusive rights as an easement or servitude, in principle those exclusive rights seem to be a servitude appurtenant to the unmined salt.

120. 88. Even when servitudes are "exclusive," they are considered less than complete ownership because the servient estate owner retains the present possessory estate. Thus, the servient owner may use the space for all purposes not inconsistent with the servitude.

121. 89. For the opinion consistently to follow a servitude approach, with fee title in the surface owner, the court should have said that the surface owners can use the containing chamber for any and all purposes that do not unreasonably interfere with the mining company's plans for present and future salt mining operations. Essentially, under modern American servitudes principles, this is a balancing test. Under this test, the case may well be correctly decided, but it depends on the fact question whether waste storage precludes economically feasible secondary mining operations.

122. 90. There is a hint in a confusing footnote. The district court criticizes the defeasible fee cases that speak of a "reversion" to the surface owner, thus implying without elaboration that the surface owners presently have fee title to the salt mine's containing chamber. 697 F. Supp. at 1269 n. 11.

123. 91. Sometimes the opinions state International Salt does not have a fee simple absolute estate in the chamber; at other times they state it does not have a fee simple estate. One cannot tell whether the courts considered the possibility of a defeasible fee simple, although they did cite many of the defeasible fee precedents.


125. 93. Calling it the "surface estate" in this context is somewhat of a misnomer, as it includes all subsoil rights, including strata, except for minerals.

126. 94. See J.W. Simonton, Note, "Rights of Fee Simple Owner of Subjacent Mineral Stratum in the Containing Space," 32 W. Va. L.Q. 242, 243 (1926) (landowners who convey coal seams are generally not aware they are creating fee estates in vacated spaces).


129. 1. A related topic is the right to inject substances into reservoirs for secondary recovery operations where it affects neighbors who are not unitized or participating in the benefits of secondary production. See, e.g., Jameson v. Ethyl Corp., 609 S.W.2d 346 (Ark. 1980) (secondary recovery methods for bromide-rich salt water not permitted by rule of capture; neighbor entitled to compensation for minerals extracted by secondary recovery).
130. 2. 75 S.W.2d 204 (Ky. 1934).

131. 3. Translated as "of wild nature."

132. 4. 75 S.W.2d at 205. The court also analogized ownership of gas to ownership of subterranean and percolating water. These waters, like the gas or wild animal, belong to the landowner only so long as they are controlled. Id.

133. 5. The court asked rhetorically:

If one capture a fox in a forest and turn it loose in another, or if he catch a fish and put it back in the stream at another point, has he not done with that migratory, common property just what the appellee has done with the gas in this case?

Id. at 206.

134. 6. Id. at 205.

135. 7. 370 F.2d 533 (10th Cir. 1966).

136. 8. In effect, the court merely applied the state's usual rules of ownership of hydrocarbons to the special case of reinjected gas.


138. 10. Id. at 348 (comparing situation to escape of elephant from Pittsburgh zoo). This raises the question whether title is lost if the stored gas is fungible with, and cannot be distinguished from, native gas remaining in the reservoir.

139. 11. The first judicial extension of the law of wild animals to oil and gas was Westmoreland Nat'l Gas Co. v. De Witt, 18 A. 724 (Pa. 1889).


141. 13. 353 S.W.2d at 878 (quoting H.M. Reasoner, Note, "Injector of Natural Gas into a Natural Underground Reservoir Retains Title to the Gas," 40 Tex. L. Rev. 290, 294 (1966)).

142. 14. Only abandonment could result in loss of title to personal property and, manifestly, this is not the reinjector's intent. Id. at 879.

143. 15. Id. at 877 (quoting a lecturer at the 8th Annual Institute on Oil and Gas Law and Taxation held by the Southwestern Legal Foundation).

144. 16. The court offered no policy reasons why the rule of capture should not apply; it only noted that defendants had failed to cite any Texas cases showing that it did apply. Id. at 880.

145. 17. 736 S.W.2d 25 (Ky. 1987).

146. 18. One justice dissented on the basis that there was no real controversy and, therefore, the majority was issuing an advisory, non-binding opinion.

It is hard to see how Texas American helps secured lenders who extend credit based on stored gas as an asset. Taking the opinion at face value, a lender could proceed with only an Article 9 security interest and no land mortgage. But would a lender do so for a major secured financing? Clearly the reservoir itself is real property. A lender who has a perfected security interest in the gas, but not the container, has less than the ideal package of collateral. One risk, in addition to not having storage rights, is that a person with paramount title to the reservoir has a lien against the stored gas for an amount representing the value of the storage rights.

147. 19. 736 S.W.2d at 28.
20. *Id.* (also stating language to the contrary in *Hammonds* is "specifically overruled"). Thus, the supreme court may have rejected the court of appeal's notion that the gas company lacks sufficient control if it owns less than 100% of the reservoir.

149. 21. Colo. Rev. Stat. § 34-64-101 to -107 (1990); Mo. Ann. Stat. § 393.500 (Supp. 1993). Perhaps these provisions reflect an excess of caution. It is difficult to see how a gas storage company could lose title to a person whose interest in the reservoir was condemned, and *Hammonds* certainly does not so hold.

150. 22. Okla. Stat. Ann. tit. 52, § 36.6 (Supp. 1993) (title remains in injector, even if part of stratum not condemned, but landowner entitled to compensation). Until the 1991 amendment, it appears Oklahoma followed *Hammonds* by statute. See Okla. Stat. Ann. tit. 52, § 36.6 (1991) ("injector . . . shall have no right to gas in any stratum, or portion thereof, which has not been condemned under the provisions of this act, or otherwise purchased").

151. 23. In *Bezzi*, however, the court stressed Oklahoma's rule of capture rather than the state's non-ownership position.


153. 25. In *Central Kentucky Natural Gas Co. v. Smallwood*, 252 S.W.2d 866 (Ky. 1952), the court held that the mineral owner, not the surface owner, had the right to receive rents under a gas storage lease. The court reasoned, under *Hammonds*, that the reinjected gas became the same as native gas. *Texas American* appears to have changed this result.


155. 27. Emeny v. United States, 412 F.2d 1319 (Cl. Ct. 1969) (oil and gas lease does not convey right to store gas produced elsewhere); see Smallwood v. *Central Kentucky Natural Gas Co.*, 308 S.W.2d 439 (Ky. 1957) (gas storage and retrieval of stored gas is not production to extend oil and gas lease under secondary term).

156. 28. Ellis v. Arkansas La. Gas Co., 450 F. Supp. 412 (E.D. Okla. 1978) (surface owner, not owner under deed of oil, gas, and other minerals, has right to store gas), *aff'd*, 609 F.2d 436 (10th Cir. 1979), *cert. denied*, 445 U.S. 964 (1980); Emeny v. United States, 412 F.2d 1319 (Cl. Ct. 1969) (purchaser of gas rights did not obtain right to store gas produced elsewhere); Tate v. United Fuel Gas Co., 71 S.E.2d 65 (W. Va. 1952). In *Tate*, a deed conveyed land, excepting oil, gas, and all minerals, but provided that the exception did not include clay, sand, stone, or surface minerals unless necessary for oil and gas production. After depletion of a gas reservoir, United stored natural gas pursuant to an agreement with the owner of the mineral reservation. The court distinguished the solid mineral cases, ruling that because the reservoir was depleted, the grantee owned the stratum. While the court paid some attention to the express allocation of "clay, sand, and stone" to the surface estate, this should not affect the analysis. With a deed that simply severs "oil, gas, and other minerals," depletion should still end the mineral estate or mineral rights because production, not gas storage, is the purpose the parties had in mind.


158. 30. The *Clayborn* servitude theory, which finds less rights for the mineral owner in vacant spaces, is also compatible with the rule that the oil and gas owner has no right to use the reservoir for storage.

159. 31. Due to the rule of capture, a well can remain in production when it is no longer draining hydrocarbons that originally lay under the subject tract.


161. 33. It does not appear to be a common industry practice to store gas in reservoirs that are still economically productive. Obviously, a surface owner who receives royalties from native gas would not prefer a premature decision to convert the field to storage unless compensation for storage rights exceeds current royalties on native gas.
34. For example, the doctrine of prior appropriation in water law.


The owner of the land overlying an exhausted gas stratum has no more possible use for it than he has for the air a mile above his house. As the airplane is allowed in the one, so should gas be allowed in the other. Nor should the land owner be permitted to demand payment for the use of that stratum.


166. 38. The condemnation approach, in principle, is no different than compulsory unitization for gas storage purposes. They are alternate mechanisms for achieving the same goals.


170. 42. 226 P.2d 965 (Okla. 1950).

171. 43. Id. at 970.

172. 44. Personal property is generally subject to abandonment. Pollution laws do not change this analysis. When a person has continued liability for improper disposal of toxic and other wastes, that liability is not predicated on title to the waste at the time of enforcement. Rather liability hinges on the prior acts of disposal.

173. 45. This evidence should be viewed skeptically. Unless the formation is uncontained, any injection must use up some capacity, in which event the plaintiff has in fact lost something -- a proportionate share in the remaining capacity of the salt water formation.


175. 2. Since this benefits the surface owner, who generally receives lease royalties, it is not surprising that surface owners do not complain that the producer is using vacated spaces in the reservoir to transport adjoining oil and gas.

176. 3. E.g., International Salt v. Geostow, 878 F.2d 570 (2d Cir. 1989). Stamm claims it is much harder to determine whether a gas reservoir is exhausted than whether solid minerals are exhausted, A. Stamm, "Legal Problems in the Underground Storage of Natural Gas," 36 Texas L. Rev. 161, 168 (1957), but the level of difficulty seems about on a par. Whenever mining leaves any mineral in place, whether in pillars or anywhere else, there is always the chance that remining may prove feasible at some future time.