

WATER DEVELOPMENT POLICIES
REGARDING GROUND WATER MINING
AND PROTECTION OF WORKS IN THE
NINETEEN WESTERN STATES

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Regarding Ground Water Mining
And Protection of Works in the
Nineteen Western States

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INTRODUCTION

The purpose of this report is to summarize agency policies regarding ground water mining and protection of works in the nineteen western states. These are policies of the state engineers or related office for administering the ground water doctrines of their state.

This report includes formal policies, noted by a reference, and informal policies based on personal communication with the member offices of the Association of Western States Engineers.

GROUND WATER DEFINITIONS

Terms related to ground water mining and protection of works as used in this report are defined below.

Ground water mining means a rate of ground water withdrawal, generally a large volume over a long period of time, that depletes aquifer storage to the extent that long-term water levels decline in the aquifer. It requires withdrawals in excess of natural discharge and recharge from all sources.

Impairment means a loss of water supply (e.g. water available within a reasonable and feasible pumping lift) to a prior use due to water level declines or changes in water quality resulting from ground water pumpage by others.

Protection of works means preserving the economic and mechanical feasibility of using a well and pump system for ground water withdrawal. It applies to protection of the water supply of prior users during water level declines due to ground water mining or well interference.

Well interference results from a pumping rate, generally a large volume from one well over a short period of time, that lowers water levels in nearby wells either for short periods during the pumping season or at the end of the season.

GROUND WATER DOCTRINES

General

Every type of ground water right doctrine in use in this country today is used in one or more of the nineteen western states. For example, ground water rights may be acquired in Oregon by prior appropriation (appropriative rights), in some parts of Arizona by the reasonable use rule, in Texas by the doctrine of absolute ownership of lands (correlative rights), and in California by all three.

Ground water rights in these states are held according to one or more of three basic doctrines: prior appropriation, the English rule of absolute ownership, or the American rule of reasonable use. Ground water rights by prior appropriation are often acquired in the same manner as surface water rights by appropriation, that is by withdrawal and beneficial use of public water according to a permit system. Under the English rule of absolute ownership of ground water, the landowner may use underlying

ground waters by virtue of his title to the land. The American rule holds that ground water belongs to the overlying landowner but limits withdrawals to that amount applied to a reasonable and beneficial use. These rights are also acquired by title to the land.

The ground water doctrines of the different states address ground water mining according to the intent of the legislation. When the object is to prevent declines in the ground water levels, the doctrines include provisions for sustained yields. In some states, the doctrines simply prohibit ground water withdrawal in excess of average annual aquifer recharge.

When the purpose of the legislation is to provide a more intensive use of the resource, it includes provisions such as the North Dakota statutes where "Priority of appropriations does not include the right to prevent changes in the condition of water occurrence, such as the increase or decrease of stream flow, or the lowering of a water table, artesian pressure, or water level, by later appropriators if the prior appropriator can reasonably acquire his water under the changed condition."

Statutes in the State of Washington limit appropriations to the capacity of the aquifer to yield such water within a reasonable or feasible pumping lift or reasonable and feasible reduction of pressure. By Colorado statutes, prior appropriators of ground water are protected and reasonable ground water pumping levels are maintained, but not to the point of maintaining historical water levels.

In some cases the object is to provide for a maximum economic return based on complete use of the resource, limited essentially by cost of extraction. By Oklahoma statutes, the Water Resources Board makes a determination of the maximum annual yield of fresh water to be produced from each ground water basin, based upon a minimum basin life of 20 years. New Mexico statutes also provide for more complete resource use where, in one case, the bottom one-third of the aquifer is reserved for domestic and stock purposes with the remainder scheduled for withdrawal over a period of 40 years.

Regardless of the degree of resource use, most statutes include provisions for protecting the interests of prior users against invasions of their right. The degree of protection ranges from protection only against malicious injury or waste (Texas), to protection based on well spacing requirements (Nebraska), replacement supply requirements (New Mexico), or established priorities of use (North Dakota).

Most state statutes also provide for designating special ground water management areas to protect certain ground water resources from undesired effects. Designated management areas are known as critical management areas, management basins, or ground water management subareas. These areas are generally defined by geographical or political boundaries to include areas experiencing continued declines in ground water levels.

Nineteen Western States

Basic ground water doctrines of the nineteen western states include prior appropriation, the English rule of absolute ownership, and the American rule of reasonable use and are summarized in Table 1 as follows:

Table 1. Ground Water Doctrines

<u>State</u>	<u>Statute, Provisions</u>
Alaska	Alaska Stat. § 46.15.030, 46.15.040(a), and 46.15.260(5) prior appropriation
Arizona	Ariz. Rev. Stat. §§ 45-101 to 45-637 (1980) American rule of reasonable use prior appropriation in irrigation nonexpansion areas designated management areas
California	Cal. Water Code § 1200 English rule of absolute ownership American rule of reasonable use correlative rights prior appropriation
Colorado	Col. Rev. Stat. § 37-90-101, 37-92-101 prior appropriation designated management areas
Hawaii	Haw. Rev. Stat. 1968 § 177-1 common law riparian rule prior appropriation designated management areas
Idaho	Idaho Code § 42-226 to 239 prior appropriation designated management areas
Kansas	Kan. Stat. §§ 82a-701 prior appropriation designated management areas
Montana	Mon. Rev. Codes §§ 85-2-301 to 85-2-520 prior appropriation designated management areas
Nebraska	Neb. Rev. Stat. § 46-601 designated management areas

Table 1. Ground Water Doctrine (Cont'd)

<u>State</u>	<u>Statute, Provisions</u>
Nevada	Nev. Rev. Stat. § 534.010 prior appropriation designated management areas
New Mexico	N. Mex. Stat. §§ 72-12 prior appropriation designated management areas
North Dakota	N. Dak. Cent. Code § 61-01 to 61-04-06.1, 06.3 prior appropriation
Oklahoma	Okla. Stat. Tit. 82 § 10001 prior appropriation, based on proportionate share of maximum annual yield
Oregon	Oreg. Rev. Stat. § 537.505 and others prior appropriation designated management areas
South Dakota	S. Dak. Comp. Laws § 46-6-1 prior appropriation
Texas	Tex. Water Code Sec. 52.002-52.120, 11.201-11.207 English rule of absolute ownership
Utah	Utah Code § 73-3-6 prior appropriation
Washington	Wash. Rev. Code § 90.44 prior appropriation designated management areas
Wyoming	Wyo. Stat. § 41-121 prior appropriation designated management areas

POLICIES REGARDING GROUND WATER MINING

General

Some of the ground water doctrines of the nineteen western states allow ground water mining, others do not. Some state policies prohibit ground water withdrawals in excess of the average annual recharge, others assist ground water users in filing tax depletion allowances on water level declines.

State policies on ground water development can be either sustained yield or planned depletion policies. Sustained yield policies provide for an assured and suitable supply of ground water in average years. Sustained yield policies would theoretically work well for shallow aquifers with low storage volumes and high rates of recharge. Planned depletion policies provide for assured supplies during the economic life, generally 25 to 40 years, of the ground water body. These policies provide a period sufficient to amortize investments in facilities and land. They would theoretically work well for deep aquifers with large storage volumes and low rates of recharge.

These classifications overlap to the extent ground water mining is allowed by state statutes. Sustained yield policies may provide assured supplies at either historical water levels or at some specified pumping lift. Planned depletion policies may likewise provide for limited depletions to encourage additional recharge from nearby sources or include total use of the aquifer storage.

Nineteen Western States

Policies regarding ground water mining in the nineteen western states include both sustained yield and planned depletions and are summarized in Table 2, as follows:

Table 2. Policies Regarding Ground Water Mining

<u>State</u>	<u>Policy</u>
Alaska	No statutory or administrative policies. No identified overdraft problems at this time.
Arizona	Statutory policy of long-term <u>balance</u> , between pumpage and annual recharge, in specified ground water management areas. Administrative policy of sustained withdrawals in those areas, including Phoenix and Tucson. Mandatory conservation program to reduce withdrawals.
California	No statutory policy. Administrative policy that pumpage should not exceed recharge over the long-term, based on a <u>cumulative departure from the mean</u> for either 28 or 35-year cycle, depending on location.

Table 2. Policies Regarding Ground Water Mining (Cont'd)

State	Policy
Colorado	Ground Water Commission Guidelines for designated ground water <u>40% decline in water levels in 25 years</u> , based on 25-year payout on investment. Administrative procedures for controlled depletions applied on 3-mile circle, well-spacing requirement. For nontributary ground water, a 100-year minimum life is mandated.
Hawaii	Statutory prohibition of mining basal water because of potential salt water intrusion. Administrative policies of sustained yields in ground water management areas. Administrative policy of short-term overdrafts in certain areas if water level declines are within 40-year averages.
Idaho	Statutory prohibition of withdrawals at a rate greater than a reasonably anticipated average rate of future natural recharge. Administrative policy of mining until impairment requires regulating to a reasonable pumping level.
Kansas	Statutory policy provides for reasonable lowering of the water table. Administrative policy of controlled depletion with 40 to 45% decline in 20 to 25 years or <u>50% depletion of saturated thickness</u> .
Montana	Statutory policy that water right is not entitlement to static water level or constant pressure. Administrative policy of sustained yields at reasonable lift or reasonable decrease in pressures in ground water management areas.
Nebraska	No statutory policy. Administrative policy by ground water management districts allowing mining in specific control areas.
Nevada	Administrative policy of withdrawals up to <u>perennial yield + 30% for return flows in agricultural areas</u> .
New Mexico	Administrative policy of mining in ground water management areas, where the amount of water in storage greatly exceeds annual recharge. Based on Supreme Court directive (Texaco vs. Mathers). Administrative policies of reserving supplies for domestic and stock uses. Remainder scheduled for withdrawal over 20 to 40 years.

Table 2. Policies Regarding Ground Water Mining (Cont'd)

<u>State</u>	<u>Policy</u>
North Dakota	Statutory policy that priority of the water right does not include static water levels. Administrative policies for sustained yields in glacial sand and gravel aquifers, limited declines to induce recharge in leaky artesian systems and shallow aquifers. Administrative procedures for controlled depletions based on in-house modeling, observation well network, and pump tests.
Oklahoma	No statutory policy. Administrative policy of <u>20-year basin life</u> at which point irrigation is infeasible but domestic supply is available. Administrative procedure for controlled depletions based on equal shares according to aquifer capacity for <u>maximum annual yields</u> . Maximum annual yield is not a sustained yield.
Oregon	Statutory policy limiting withdrawals to an average annual recharge. May include reductions in head to a reasonable level.
South Dakota	Statutory policy that cumulative withdrawals cannot exceed average annual recharge.
Texas	General policy of uncontrolled pumpage although Underground Water Conservation Districts may be created to control well spacings and pumpage.
Utah	No statutory policy. Administrative policy of denying applications that would cause mining, except for domestic uses.
Washington	Statutory policy of limiting withdrawals to a reasonable and feasible pumping lift or reduction in pressure. Administrative policies for planned depletions in some ground water management areas.
Wyoming	No statutory policy. Administrative policy for sustained yields as set by agency director.

POLICIES REGARDING PROTECTION OF WORKS

General

Very few of the nineteen western states provide protection of works as part of a water right for those wells that are inefficient or penetrate only a small percentage of the saturated thickness of the aquifer. Sixteen states have no administrative procedures for compensation or redress for prior rights that experience declining water levels without impairment. In these states, recourse to the courts is the only alternative for seeking such relief.

The well system is commonly considered not a part of the water right itself but rather the means of exercising the right. If water is available at a feasible lift, then protection of works generally does not include the efficiency of the well used by a senior right.

Six states provide a preference system for ground water allocation when an aquifer is fully appropriated (at its maximum lift) and a water shortage occurs. In almost every case, domestic uses command the highest preference. In Nebraska, those using ground water for domestic purposes have preference over those claiming it for any other purpose and those using it for agricultural purposes have preference over those using the same for manufacturing or industrial purposes.

Nineteen Western States

Policies regarding protection of works in the nineteen western states range from little or no protection to protection of average annual water levels in perpetuity and are summarized in Table 3 as follows:

Table 3. Policies Regarding Protection of Works

<u>State</u>	<u>Policy</u>
Alaska	Well deepening costs paid by owner. Statutory authority for public water supplies.
Arizona	Well deepening costs paid by owner.
California	No protection of works except by <u>court adjudication</u> . Well deepening costs paid by owner.
Colorado	No protection of works except by court action. Well deepening costs paid by owner unless injury can be proven. Domestic priority among competing applications. Priority date doctrine.
Hawaii	Protection of works by sustained yield requirements.

Table 3. Policies Regarding Protection of Works

<u>State</u>	<u>Policy</u>
Idaho	Protection of works through <u>Ground Water Review Board</u> . Domestic preference may condemn any other uses provided compensation is made. #2 mining and milling, #3 agriculture, #4 manufacturing.
Kansas	No protection of works except with impairment.
Montana	No protection of works except with impairment or in designated management areas. No preference system other than priority date unless other rules apply in designated management areas.
Nebraska	No protection of works except by court action. Preference system #1 domestic, #2 agriculture, #3 manufacturing.
Nevada	Administrative preference system #1 domestic, #2 commercial, #3 industrial, #4 stockwater, #5 fish and wildlife, #6 irrigation.
New Mexico	No protection of works except with impairment. Protection may include replacement supply (Mine Dewatering Act).
North Dakota	Preference among competing applications. #1 domestic, #2 municipal, #3 livestock, #4 irrigation, #5 industrial, #6 fish, wildlife, and recreation.
Oklahoma	No protection of works except by court action.
Oregon	No protection of works except with impairment as determined by State Engineer. Beneficial use of aquifer takes precedence over maintenance of water levels.
South Dakota	Protection of works by sustained yield but does not include pressure on artesian systems or well construction conditions. Head pressure is not protected as a means of delivery.
Texas	No protection from "impairment."
Utah	No preference system other than priority date. Protection may include replacement supply.

Table 3. Policies Regarding Protection of Works

<u>State</u>	<u>Policy</u>
Washington	No protection of works except with impairment. No preference system other than priority date.
Wyoming	No protection of works except with impairment or as set by <u>director</u> . No preference system other than priority date.

SUMMARY

Ten of the nineteen western states have statutory or administrative policies that provide for controlled lowering of the water level in an aquifer (ground water mining) as part of managing their public ground water resources. Eight of the nineteen western states have statutory or administrative policies limiting ground water withdrawals to annual or long-term recharge conditions. One state has no statutory or administrative policies regarding ground water mining.

Policies regarding ground water mining range from sustained yields based on average annual recharge to planned depletions of storage over a 20-year period. Four of the 19 western states (California, Hawaii, Nevada, and South Dakota) have statutory or administrative policies that require sustained yields based on average or perennial recharge values. Eight of the 19 western states (Arizona, Idaho, Kansas, Montana, Oregon, Utah, Washington, and Wyoming) have sustained yield policies with greater flexibility in permitting storage depletions or water level changes for management purposes. These water level changes may be limited to special ground water management areas, a maximum pumping lift, or rate of water level decline. Six of the 19 western states (Colorado, Nebraska, New Mexico, North Dakota, Oklahoma, and Texas) have policies that allow a greater degree of ground water mining to occur. Four of these six states limit ground water mining to planned depletions over an economic life of the aquifer, generally 25 to 40 years, to provide for amortization of investments. One of the 19 western states (Alaska) has no policy regarding ground water mining.

Seven of the nineteen western states have statutory policies regarding protection of works, including priorities of preferred uses. Two of the nineteen western states have administrative policies, in lieu of statutes, regarding protection of works. The remainder of the nineteen western states provide no statutory or administrative protection of works. Protection of works generally does not include well-deepening costs as long as an adequate supply is available. In most states, well-deepening costs are usually paid by the well owner. Two states (New Mexico and Utah) have policies regarding protection of works that provide for replacement supplies to prior users in cases of impairment. Four states (Alaska, Colorado, Idaho, and Nevada) have preference systems for allocating water during periods of insufficient supply. In these states, domestic use has the highest preference.