

Underground Water Problems in New Mexico and
Specifically in the High Plains Area

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It is certainly not my intention to attempt to compete with Mr. Charles Harris, who gave us such a fine paper this afternoon, but I do believe that some of the ground water problems of New Mexico are most assuredly relative to the water laws of New Mexico and I can hardly mention one without the other. Although the High Plains of New Mexico are specifically absent of almost any flowing streams, relationship between surface water and ground water, in so far as the history and development, must be mentioned for purposes of obtaining a more clear picture.

The type of waters which were used generally in the western states were from streams and the oldest rights are therefore in the base flow of these streams. The flow sustained largely by ground water, thus any surface water rights have higher priority than the rights to wells in the same basin. The priorities as set up by nature in the hydrologic cycle are just the opposite, as the replenishment to ground water reservoirs takes precedence over maintenance of stream flow. To date, relative water conflicts have arisen between users of water from wells and from streams, except possibly in the Roswell Artesian Basin of the Pecos River Valley, where possible serious conflicts may arise between these two users. It is inevitable that complex problems will arise as water levels in ground water basins and the flow of streams continue to decline. It is my personal opinion that these problems can be settled only by an adjudication of all water rights based on full recognition of the physical principles governing the movement of water throughout the hydrologic cycle under natural conditions and the changes that have been affected by development of the waters.

The actual administration of the use of water, whether it be surface or underground, has been impaired in recent years by the courts and the general public showing a lack of thorough understanding of the implications of the hydrologic cycle of ground water and consequently its first cousin, surface water. I believe that many of our water laws were developed in days when knowledge of water, both surface and underground, was very meager. In fact, some of these interpretations have been carried down into recent decisions and can not be valid any longer in the light of our present knowledge.

One ground water problem and one which I certainly consider to be the most serious water problem of all, is the perennial overdraft from a

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ground water reservoir. In such reservoirs as the one which we have in Lea County, wells year after year, draw water in excess of the annual replenishment and the excess must therefore come from storage. Several of the problems of ground water mining under the appropriative doctrine of New Mexico were clearly brought out in the district court trial of Luther Cooper against the State Engineer's denials of his applications for wells in Lea County. Findings by the State Engineer indicated in the hearing, that pumping of ground water in Lea County since 1948, had been far in excess of recharge and that the excess had come from storage. Further information introduced, indicated that while large excesses of water had been removed from the ground water basin, large volumes remained in storage and much of it could not be removed by the existing wells at that time. The court, having to rely on information introduced, due to the absence of protest from existing well owners, stated that apparently public opinion was not hostile to drilling additional wells for mining of additional water and that apparently no one seemed to favor a reduction in pumpage. Consequently, the State Engineer, following additional studies, extended the boundaries of the Lea County underground basin and set 40 years as a period for reasonable depletion of the ground water reservoir. He further approved applications for new wells in areas where existing wells would not dewater the reservoir within that period and encouraged the change of location of water usage from concentrated areas to less developed areas. A new factor, therefore, has apparently extended the administration of the ground water law and the area has become a criterion in appropriative water rights. History of development in most western ground water includes declining water levels and in the following order, installation of shallow well pumps, installation of deep well pumps, deepening of wells and general over-all increased cost of operation. After decline in water levels become more serious, court suits become more common; such as interference created between wells and eventually on a broader aspect, interference and law suits between between areas of use. These are all the natural follow-up of the efforts on the parts of individuals or districts to maintain a status quo which they enjoyed prior to the mining operations. I most sincerely believe that our present existing ground water laws, as well as our antiquated surface water laws should most certainly be modernized to include the additional hydrologic facts which we have learned within the past 25 years.

I am of the opinion that not only in Lea County but throughout the entire arid southwest, low in precipitation, that we should make every available effort to protect and to conserve all of our nonconsumptive use waters. This could be return flow from irrigation, sewage, waste and precipitation. Many of our western states and including New Mexico, permit the appropriation of water which has been used but not consumed under other rights. There are many such practices of this within New Mexico which I deem most wasteful, in that a large majority of this nonconsumptive water could, by various means, be returned as recharge for further consumptive use based on approved water rights. Many thousands of acre feet of nonconsumed ground water are wasted

each year by disposal plants, irrigation companies, industry and individual earthen ditches by evaporation and transpiration. The best storage reservoir available is the ground water basin itself. Water which is lost by seepage is in a large part lost to use by man. It is common knowledge that only a small part is returned to the ground water system for future use, while the major portion is evaporated or transpired.

As our ground water basins become more depleted each year, water on a whole becomes more and more precious and more and more money, whether public or private, will be spent for the protection and conservation as the preciousness increases.

We in Lea County are being faced with a most important problem which, while not too readily recognizable at this time, will no doubt grow into an increasingly cancerous growth as time progresses. Little has been thought of, regarding the salt water being produced by oil wells all over Lea County at the present time. It has, until very recently, been the common practice by the oil producers to get rid of this highly undesirable liquid at the least amount of cost. The highly mineralized salt water has been separated from the oil and dumped into natural dry lakes, into man made surface reservoirs or spread out upon the ground and allowed to flow where it might. From the May, 1956 Oil and Gas Report, there was a reported daily salt water production in Lea County alone of 118,123 barrels, or .362 acre feet per day. Having talked with various oil company operators over the past two years, at which time I became acquainted and personally concerned with the problem, it is agreed that these figures are on the order of 30% low of the actual production figures. More accurate figures of this salt water production would then be on the order of 154,000 barrels per day. This means then, that based on May, 1956, reports there is a total of approximately 172 acre feet per annum being spread upon the surface of the land in Lea County, New Mexico. This further indicates that there is a great deal of this produced salt water being allowed to percolate downward into the fresh ground water system which will time and ultimately, pollute all of the fresh water in the Lea County underground basin. I am happy to report that through the combined efforts of the State Engineer, the New Mexico Oil and Gas Commission and the oil companies themselves, already much has been done to alleviate this problem by the setting up of machinery in order to inject this salt water underground below any oil or fresh water horizons. Much needs to be done and rapidly, and it is my sincere opinion that efforts be made in major proportions to alleviate this problem within the very, very near future. The damage already suffered by the ground water system is yet unmeasurable and will be virtually unknown for some period of time until after levels have declined further, requiring the necessity of deepening the existing wells. This problem of salt water pollution, I believe, to be the major problem of importance that we have today in Lea County.