IDENTIFICATION OF FUTURE WATER PROBLEM
HIGHLAND URANIUM MINE AND MILL
CONVERSE COUNTY, WYOMING
FOR EXXON COMPANY, U.S.A.

Dames & Moore Job No. 08837-050-06
Salt Lake Ckty, Utah
March 15, 1978

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March 15, 1978

Exxon Company, U.S.A.
Post Office Box 3020
Casper, Wyoming 82601

Attention: Mr. Terry Laverty

Gentlemen:

Ten copies of our report entitled "Identification of Future Water Problem, Highland Uranium Mine and Mill, Converse County, Wyoming, For Exxon Company, U.S.A." are herewith submitted.

The purpose and scope of this study were planned in discussions between Messrs. Terry Laverty of Exxon, and Mr. George C. Toland and Albert D. Pernichele of Dames & Moore. These are outlined in Exxon Work Request Number Three, dated May 20, 1977, but have been modified in subsequent conversations.

A summary of the results of this study is presented on the following page.

We appreciate the opportunity of performing this study for you. If you have any questions regarding this report, please contact us.

Yours very truly,

DAMES & MOORE

Albert D. Pernichele

Albert D. Pernichele
Associate

by George C. Toland

ADP/sm

SUMMARY

This report presents the results of a water management study for the Highland uranium mine and mill. Presently, about 1,000 gpm of water are produced from the underground mine, surface mine, and dewatering well system. A portion of the well water production supplies plant needs for culinary, boiler feed and other uses where high quality water is needed. Process water is obtained principally by pumpage from the open pits and is stored in the mill ponds and process water tank. Presently, excess water, estimated at 150 gpm over demand, is produced from the system and has resulted in a storage problem.

It is estimated that net ground water production from the surface mine will increase with time from about 390 gpm at present to 530 gpm by 1985. Water production from the underground mine is expected to increase slightly from the present 300 gpm, and then decrease to about 140 gpm by 1985. Dewatering well water is projected to steadily decrease from the present 300 gpm to 50 gpm by 1985. With the additional water requirements for the mill expansion, a shortfall increasing to about 170 gpm by 1985 is projected to occur. The shortage is expected to be mostly for high quality water.

It is concluded that it is not advantageous to develop surface water resources.

Utilization of water produced from underground operations at Highland West or construction of additional wells near the Highland mill, but away from the ore body, appears to be

the most feasible method of obtaining the required additional water. Reduction in water losses within the system and modification of quality requirements for some uses would also aid in the supply problem at the mill. However, an excess of water at Highland West will occur, which will require discharge.

The evaluation of the supply and demand picture is dependent upon many factors for which the quality of data is judged to be fair, at best. The analysis is particularly sensitive to past and present water production rates and to tailings pond seepage for which only rough approximations can be made. Therefore, the numerical values obtained should be viewed with some caution.

It is recommended that a comprehensive water monitoring program be initiated which will serve to further evaluate water production, consumption, and accumulation or loss. Plans should be made to develop an additional water supply of 100 to 300 gpm of which 75 of 150 gpm should be of a culinary quality. Investigation of quality requirements of future uses should be made so that diversion of higher quality water from uses where drinking water quality is not essential can be made. Maintenance of the present dewatering well system will be needed.

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IDENTIFICATION OF FUTURE WATER PROBLEM

HIGHLAND URANIUM MINE AND MILL

CONVERSE COUNTY, WYOMING

FOR

EXXON COMPANY, U.S.A.

INTRODUCTION

This report presents the results of our water management study for the Highland Uranium Mine and Mill, Wyoming.

Exxon's Highland Uranium Operation has recently experienced a problem with excess water accumulation. The brunt of the problem was focused on maintaining the required freeboard allowance in the tailings pond. The recent completion of a raise on the existing tailings dam has apparently solved the problem for the immediate future. However, A planned mill expansion and changes in the mining operation have made the future water situation uncertain. Recognizing the need for development of a water management plan for the successful management of its uranium operations, Exxon has authorized this study.

Present plans by Exxon are to continue the open pit mining operation at the Highland mine into 1986 and continue underground work through 1985. The mill is to be expanded in 1980 and will operate at least through 1988. The new Highland West underground mine is to be developed starting in 1981 and operated through 1992. This study has developed, to the best extent possible, a water management plan for future mining and milling activities at the Highland Mining operation.

OBJECTIVES AND SCOPE OF STUDY

The technical objectives and scope of our studies were developed between Messrs. Terry Laverty of Exxon and George C. Toland and Albert D. Pernichele of Dames & Moore. These objectives, outlined in Exxon Work Request Number Three, dated May 20, 1977, and as subsequently modified verbally, were to evaluate pertinent data on the geology, hydrology, and the mining and milling operations; develop a project water budget; identify water supply or disposal problems, assess potential water treatment methods, if needed; and develop a water management plan.

The scope of our study has included site visits to gather available pertinent data; collection and review of published hydrologic and geologic information; development of a ground water model to evaluate flows, utilizing computer methods; development of a surface water model to evaluate the potential for signficiant utilization of surface water; engineering evaluations, and preparation of this summary report. This report presents projected water budgets, discussion of alternate additional water supply sources, assessment of potential water treatment methods, and recommendations.

Due to the uncertainty of the status and timing of future critical mining and milling alternatives, water budgets have not been projected beyond the year 1985, the expected life of the Highland open pit and underground mines. When government regulations are more fully developed, specifically with regard to tailings disposal, and future operational alternatives are better defined, a more definitive study covering the life of the Highland West mine and the Highland mill beyond 1985 can be undertaken. Also, at that time, more reliable data will be available for model input.

The study approaches the problem from a broad analysis of the current site water system from which data is drawn to develop predictive models of future water supply. From data provided by Exxon, a compuer ground water model has been developed to evaluate the future production of water from dewatering wells, open pits and the Highland underground mine. The incomplete history of water production at the Highland operation has placed restrictions on the accuracy of the ground water model. A surface water model has been developed to evaluate the quantity of runoff generated in the Highland vicinity. The surface water model is based on generalized data generated by a U.S. Geological Survey study.

These models are used to provide the water input data for the projected water budgets. Water loss projections, i.e., evaporation and seepage, are estimated from the best data available to Dames & Moore. No actual site measurements of these parameters exist. Water budget input in regard to future water requirements and future mining and milling activity is based on information received from discussions with Exxon personnel.

From the projected water budgets thus obtained, it was determined that future water excesses will not develop; hence, evaluation of potential water treatment and/or disposal methods was not required.

The development of a water management plan is highly dependent on an evaluation of the quantity and quality of water supplies required for future operation and the availability of sources to meet this future demand. A discussion of water losses which helps create this future demand and possible mitigation alternatives is also presented.

SITE CONDITIONS

GENERAL GEOLOGY

The Exxon uranium mine is located near the southern margin of the Powder River structural basin of northeast Wyoming. The basin is expressed as both a topographic and structural low, bounded on three sides by structural highlands. The basin is flanked on the east by the Black Hills Uplift, on the west by the Bighorn Mountains, on the south by the Laramie Mountains and Hartville Uplift, and opens northward and extends into Montana. While lying in the Powder River structural basin, site drainage is to the Cheyenne River system.

The Powder River basin was filled in early Tertiary with continental deposits of the Fort Union and Wasatch Formations. The Fort Union Formation of Paleocene age is represented by 2,200 to 3,500 feet of semiconsolidated sandstones and siltstones with some minor beds of coal. This unit outcrops at the margins of the basin as a peripheral band surrounding the overlying

Wasatch Formation. The Wasatch Formation, of early Eocene age, occupies the central portion of the Powder River basin. It is made up of 1,000 to 3,000 feet of clays and silts, containing thick lenses of coarse, crossbedded, arkosic sandstone. The Wasatch Formation also contains thin seams of coal.

The axis of the basin trends N30°W. Measured dips on the Wasatch Formation in the central portion of the basin range from less than one degree to two and one-half degrees. At the margin of the basin, the Fort Union Formation steepens to as much as 20 degrees. Dips are usually low to the east and reach maximums at the south and southwest fringes of the basin.

A generalized stratigraphic description of the formations in the site area is presented on Table 1.

LOCAL GEOLOGY

The Exxon uranium mine is located in the southern portion of the Powder River basin. The ore body occurs within three broad sandstone lenses of the lower Wasatch Formation and upper Fort Union Formation. The Wasatch Formation is believed to be about 100 feet thick at the site due to truncation by erosion.

The sandstone lenses consist of fine-to-coarse-grained, arkosic sands which were deposited as fluvial sediments. The host sands are separated by fine-grained sandstones, siltstones, and claystones, and are continuous throughout the area. The host units comprise an interval of 110 feet at the southern extent of the ore body and 180 feet at the north end.

A series of subparallel anticlines, with amplitudes of 10 to 20 feet, dominate the structure of the area. These structures plunge northwest towards the center of the basin. The ore body is generally subparallel to the flanks of the most prominent anticlines of this series. The dip of the Fort Union Formation is less than one degree to the northwest as calculated by the three-point method. No faulting has been detected in the area either by surface studies or drilling.

GROUND WATER

GENERAL

Stratigraphic units and their water-bearing characteristics are summarized on Table 1. Of principal interest to this study are the characteristics of near-surface sandstone aquifers of the Wasatch Fromation. Other aquifers of interest include alluvial deposits of Holocene age, and the Paleocene Fort Union Formation.

Holocene alluvium exists mainly in the valleys of creeks and consists of poorly stratified clays, silts, and sands, up to about 40 feet in thickness. Ground water is perched on clayey zones in the alluvium or near-surface bedrock. Potential for development of alluvial ground water supplies is low except for very small non-culinary uses.

The Wasatch and Fort Union Formations are quite similar near the site, typically consisting of lenticular fine-to-coarse-grained sandstones interbedded with claystone and siltstone. The Wasatch Formation yields significant amounts of water to wells, up to 500 gpm (Hodson and others, 1974), in the south central portion of the Powder River basin. The Fort Union Formation which is approximately 3,000 feet thick at the site is capable of yielding significant amounts of water. It yields 20 to 150 gpm to wells which tap several upper sandstone strata in the vicinity.

The Lance Formation which underlies the Fort Union Formation is 2,500 to 3,000 feet thick in the vicinity. It is made up of fine-to-medium-grained sandstones and interbedded sandy shales and claystones. Yields from the Lance Formation are generally small and of poor quality (Hodson and others, 1973). The underlying Fox Hills Formation is used for municipal and domestic water supplies elsewhere in the basin where no suitable supplies are available from shallower formations. However, its depth at the site, 5,500 to 6,000 feet, is greatly in excess of normal water well depths. Thick shales underlie the Fox Hills Formation.

Ground water use in the vicinity includes a number of small stock water wells of low yield. The North Morton Ranch underground mine, located two and one-half miles to the west, produces approximately 100 to 200 gpm from the underground mine and dewatering wells according to Exxon personnel. Open pit mining has commenced at the United Nuclear property four miles to the south. Major pumping from the pit has not occurred to date. Kerr-McGee has an underground operation eight miles to the west.

SITE AND VICINITY

The principal aquifer of concern at the site is a series of sandstone strata interbedded with shale layers. The uppermost sandstone is referred to as the tailings dam sandstone and is about 50 feet thick. It is not saturated at the site. The top of the stratum lies at about elevation 5,180 feet. This sandstone is underlain by a shale, referred to as the tailings dam shale, which is about 40 feet thick.

The ore zone, referred to as the Highland sandstone member, underlines the tailings dam shale and typically consists of three sandstone strata separated by shale. The sandstone strata are typically 30 to 50 feet thick. The shales which separate the sandstones are generally 20 to 40 feet thick and are relatively continuous. The sandstones are hydraulically connected, however.

Little data are available regarding water levels existing at the site prior to mining. The static water level in test wells drilled during the Dames & Moore study of 1971 stood at elevation 5,112 feet. The static water level in dewatering Well No. 4 was reported to be at elevation 5,110 feet during March 1971. These elevations probably represent pre-mining conditions throughout the site.

Values of transmissivity, storage coefficient and permeability have been evaluated from the results of several pumping tests conducted at the site, in the Highland West area and North Morton Ranch area. These tests were conducted on the same part of the formation, but not all were on equivalent layers. Pumping test data from tests conducted on Exxon property are summarized on Table 2. Permeability data obtained by Exxon for the middle sandstone at the Highland West area by laboratory testing of core and from pulse tests are summarized on Tables 3 and 4. Pump test and piezometer data for the North Morton Ranch area, obtained from data submitted in support of environmental studies, are summarized on Tables 5 and 6. This information was evaluated and a value of 4,500 gallons per day per foot (gpd/ft) was selected as representative of the entire Highland sandstone member. The storage coefficient for the entire member is estimated to be about 4×10^{-5} (dimensionless) when under confined conditions. Pumpage from the member has reduced the potentiometric surface below the upper and middle sandstone, and therefore the coefficient of storage will now reflect unconfined conditions in the upper and middle members.

Recharge to the Highland sandstone member in the vicinity is expected to be negligible in comparison with discharge rates, due to the presence of the overlying tailings dam shale.

The quality of the ground water is good. Ground water is of the sodium bicarbonate type. Calcium and sulfate are also major constituents. Total dissolved solids average approximately 382 milligrams per liter (mg/l); chloride averages 18 mg/l; and sulfate averages 112 mg/l, excluding data for Wells No. 25 and No. 26, which show abnormally high values, based upon available data. Radium-226 concentrations occasionally exceed 5 picocurries per liter (pc/l), the drinking water standard for combined radium-226 and radium-228 concentrations. Chemical and radiochemical quality parameters are summarized on Tables 7 and 8, respectively.

DEWATERING WELLS

Seventeen dewatering wells have been constructed in the mine area. The wells have been generally pumped at rates varying from 15 to 70 gpm, although some have been shut down. The wells were screened in nearly all sandstone intervals below the original ground water level. Pumps were set deep and generally operated on a cyclic basis with pumpage commencing when the water level in the well rose to 30 feet above the pump and stopping when the water level fell to 10 feet above the pump. Therefore, nearly all of the screens were dewatered during pumping. Dewatering well data are summarized on Table 9. Past pumpage rates from the wells, based upon estimates made by Exxon personnel, are presented on Table 10.

Seepage From Tailings Area

Seepage from the tailings area to the open pits has been estimated based upon information obtained during previous studies (Dames & Moore, 1976), and under the assumptions of steady-state seepage conditions. Estimated seepage quantities are shown on Table 10. The estimates are very approximate, but better values cannot be made based upon the available data. Although this seepage adds to the total pumpage from the surface mine, it does not contribute to net water production.

SURFACE WATER

The topography of the Highland site is characterized by gently rolling upland areas and broad stream valleys that are dissected by numerous draws with relatively steep slopes and rounded ridge crests. The Highland Flats, an upland area, is a remnant of a late Tertiary erosional surface. Shallow depressions, called playas, provide natural impoundments for surface water on Highland Flats.

The principal drainage of the site area is North Fork Box Creek, an intermittent stream which drains easterly into the Lightning-Lance Creek system which eventually drains into the Cheyenne River. Hence, the site area drains into the upper Cheyenne River basin.

The only continuously flowing stream in the area is the North Platte River, which at the nearest point is approximately 15 miles to the south of the site. Highland drainage does not flow into the North Platte River.

There are a few small man-made impoundments across stream beds in the site vicinity. In their natural state, these impoundments generally contain water only during the spring months and sporadically during the summer months.

Part of the annual runoff comes from snowmelt, but high-peak flows are the result of runoff from convective-type storms which approach from the west. Records from gaged small watersheds in the vicinity indicate that one or two such runoff events can be expected each year during the summer.

The generally open exposure of the basins to sun and wind results in rapid drying and high evaporation of open water and soil moisture.

GROUND WATER MODEL

COMPUTER MODEL

A computer model was used to simulate the geohydrologic conditions resulting from past ground water production and to estimate future production and availability. Dames & Moore computer program EP-17, Analysis of Water Level Drawdown in a Homogeneous Confined Aquifer, was selected for the analysis. This program uses a convergent series numerical method to solve the Theis and Hantush equations of transient flow to wells in a leaky or non-leaky ideal aquifer. Although the program was intended to be used primarily for confined aquifers, it is applicable to water table aquifers after sufficient time of pumpage has occurred where the effects of delayed gravity drainage have dissipated. More complex computer methods were not used since the input parameters and boundary conditions were not known to the degree which justified the use of these more sophisticated and expensive methods.

The model used a series of wells to simulate the effects of flow to the underground workings, including the shaft, the open pit mine and the dewatering wells. Past flows to the open pit and future ground water flows to the system were calculated by adjusting the flows to produce the available drawdown at the well sites. Input parameters consisted of aquifer transmissivity; vertical leakage factor, location of wells; pumpage rates from the dewatering wells, underground workings and open pits; and duration of pumpage at the various rates. Since the coefficient of storage changes with time as the aquifer is unwatered in the vicinity, calibration of the model using known past and present water production rates to determine the effective storage coefficient was necessary.

INPUT PARAMETERS

A value of 4,500 gpd/ft for aquifer transmissivity was used based upon the results of past aquifer tests in the area as described previously.

Vertical leakage recharge to the aquifer was assumed to be zero due to the presence of overlying shale strata, the lack of nearby streams, and low precipitation in the area. Recharge to the system, mainly to the open pits, due to seepage from the tailings pond and other water holding areas, was accounted for by subtracting the estimated quantities from water production from the open pits.

In the model, dewatering wells were placed at their known locations. Four wells, used to simulate the drawdown effects of dewatering of the shaft and underground workings, were placed in a square configuration 500 feet apart around the shaft location. Flow to the open pits was simulated by a series of wells located around the periphery and within the pits. Pumpage of the wells was periodically changed to simulate mine development with time. Locations of these wells for the various time periods are shown on Plate A-1 in Appendix A of this report.

Past and present pumpage rates from the dewatering wells and underground workings were obtained from information supplied by Exxon as summarized on Table 2. Flow rates from the wells simulating the open pits were obtained by estimating the flow rate required to produce the effective drawdown which would occur at the pit. Effective drawdown is the amount of drawdown adjusted for the reduction in transmissivity of the well or pit face produced by unwatering of the aquifer. The reduction in effective drawdown is in accordance with the relationship (Jacob, 1973, pp. 245-254):

$$s' = s - s^2/2m$$

Where "s'" is the effective drawdown, "s" is the true drawdown, and "m" is the aquifer thickness.

When complete drawdown of the water table occurs as in the case of the open pits, then s = m and s' is equal to one-half the available drawdown. Therefore, effective drawdowns equal to approximately one-half of the available drawdowns were used in the analyses.

Past and present production rates from the open pits were used to calibrate the model. This was done by computing the total water production from the system using several assumed storage coefficients and then selecting the storage coefficient which resulted in a matching of the given production rate from the open pit. Drawdown calculated to result from the selected model in umpumped wells in the vicinity at the present time was checked against measured values. A reasonable comparison of values was obtained.

The possible effects of pumpage from nearby mines was checked by hand calculations to evaluate whether water production from these facilities should be included in the computer model. Using the values of transmissivity and storage for the site vicinity, pumpage from the North Morton Mine was found to produce negligible drawdown, on the order of two feet after five years at the site. The affects of pumping from other mining operations in the area is considered negligible, relative to the accuracy of the data base used in this study, and the geohydrologic conditions at the Highland mine.

Estimates of future water production were obtained by finding the pumpage rates which would produce required effective drawdowns in the wells. Effective drawdowns increase somewhat with time since mining progresses downdip.

The details of the input parameters, pumpage rates and resulting drawdowns are presented in Appendix A.

RESULTS

A summary of the computer model results in the form of water production with time is presented on Table 11. Details of input and output parameters are presented in Appendix A.

As shown on Table 11, ground water production from the surface mine is projected to increase with time from approximately 390 gpm at present to 500 to 570 gpm from 1983 through 1985 (not including seepage from the tailings pond). Decreases in flow to the underground mine and the dewatering wells are projected to occur. This is primarily due to the influence of the cone of depression from flow to the surface mine and to destruction of wells during excavation of open pits. The net result is a projected decrease in total water production of about 250 gpm by 1985.

It is expected that these projections are reasonably accurate within the framework of the mining plan. Although the value of transmissivity used is open to question due both to the poor quality of the aquifer test data and to the variable nature of the formation, the predicted future water production should not be strongly sensitive to this problem because of the compensating factor of the selection of an effective storage coefficient. Predicted future water production is more sensitive to the quality of the data regarding the approximate past and present production rates used to calibrate the model.

SURFACE WATER MODEL

GENERAL

The surface water model used for the Highland Operation was derived primarily from work done by the U.S. Geological Survey in studying the hydrology of stock ponds in the upper Cheyenne River Basin. The USGS study was performed in two segments and the results were published in Water-Supply Paper 1531 (WSP 1531), "Hydrology of the Upper Cheyenne River Basin." WSPS is divided into two sections corresponding to the two segments of the study: a) Hydrology of Stock-Water Reservoirs in Upper Cheyenne River Basin, and b) Sediment Sources and Drainage Basin Characteristics in Upper Cheyenne River Basin.

In essence, the USGS study modeled the effective surface runoff as a function of the rock unit formation outcropping in the subbasin area. Five rock units were considered in the study: the Wasatch, Lance, Fort Union, and Pierre Formations and the White River Group.

The Highland operation is located in the upper reaches of the Upper Cheyenne River Basin, and is underlain by the Wasatch Formation.

MODEL DEVELOPMENT

Water-Supply Paper 1531 developed a relationship between annual runoff in acre-feet per square mile, and drainage density in miles per square mile. Drainage density can be thought of as the texture of topography, and is calcuated by dividing the length of stream channels within each basin by the area of the basin. The drainage density for the Wasatch Formation averages about 5.4 miles per square mile in the USGS study area. By applying the drainage density value of 5.4 miles per square mile to the runoff-drainage density relationships developed in WSP 1531 for two different precipitation data bases, Figure 1, presented on Plate 2, was constructed. Figure 1 shows the relationship between annual rainfall in inches, and annual runoff in acre-feet per square mile, for the Wasatch Formation outcrop area of the upper Cheyenne River basin. The average annual precipitation for Casper, Wyoming, is 11.4 inches. The corresponding average annual runoff from Figure 1 is 11.5 acre-feet per square mile.

MONTHLY DISTRIBUTION OF RAINFALL AND RUNOFF

Forty-three percent of Casper's precipitation falls during April, May and June. This period is also the prime period for runoff due to the high antecedent soil moisture content associated with the spring seasons and the nature of thunderstorm activity during the spring and summer seasons. For the purposes of this study, it has been assumed that the distribution of runoff appproximates that of precipitation on a percentage basis over a year's period. Figure 2, presented on Plate 2, is a histogram of the runoff distribution by month for the Wasatch Formation based on Casper precipitation frequency records.

DRAINAGE SUB-BASINS

As can be seen from the delineation of sub-basins as shown on the Vicinity Map, Plate 1, only two sub-basins are of significant area. These two sub-basins drain into Reservoir 2A and Antelope Reservoir, respectively. Reservoir 2A commands a drainage area of 13.4 square miles, and Antelope Reservoir a drainage area of 3.1 square miles.

Although the drainage area above into the mine pits approximates the sub-basin area of Antelope Reservoir, the changing features of the pit drainage area due to operation activities and the relative accuracy of water measurements of pit-produced ground waters and seepage negate any attempt to quantify the relative insignificant amount of surface runoff waters which drain into the pits.

AVAILABILITY OF SURFACE RUNOFF WATERS FOR OPERATIONS USE

Runoff collection for use by the Highland operation would be accomplished through the use of two existing reservoirs: Reservoir 2A and Antelope Reservoir. The use of Reservoir 2A waters would require the installation of pumping and pipeline facilities. Antelope Reservoir could be modified to allow direct discharge into the existing mill ponds.

The amount of runoff water which could be used for operational purposes is the amount of runoff harvested minus the losses incurred; with the primary losses being evaporation and seepage from the storage reservoirs. Table 12 presents data on the quantity of runoff water harvested by the existing two reservoirs and the amount of water available for use after evaporation and seepage losses are considered.

When examined on an average annual basis, potential surface water supplies could account for an addition of less than 30 gpm to the Highland operation. This value of itself is open to discussion since the values used for runoff and seepage in computing available water are generalized estimates, and not measured values for the specific sub-basins and reservoirs in question.

It must further be pointed out that the 30 gpm value is based on the mean annual precipitation. Based on the 36-year precipitation record from 1940 to 1975, Casper has received a low of 7.3 inches and a high of 16.2 inches in a year. The mean annual precipitation is 11.4 inches, with a standard deviation of 2.4 inches. This means there is approximately a 68 percent chance of the annual precipitation falling in the range of 9.0 to 13.8 inches. Figure 3, on Plate 2, shows the probability of generating a given amount of annual runoff on an areal basis, based on the Casper precipitation data and the surface runoff model.

Table 12 also shows that if only the months of April, May and June are considered, approximately 100 gpm runoff water could be used by the operation during this three-month period. Such a scheme would be of limited value; however, since an alternative source of water would be required for the remainder of the year. Should further investigation and management decision call for the operational use of harvested runoff waters on a seasonal basis, detailed probabilistic analysis of spring and early summer precipitation and runoff would be warranted.

The application of physical and chemical runoff harvesting techniques to the drainage sub-basins and reservoirs could significantly increase the yield of runoff water for operational use. However, legal and economic constraints would, in all likelihood, make such techniques impractical.

An aspect of the use of surface waters which must be considered is that of water rights. An investigation into possible prior water rights to these surface waters and an opinion from legal counsel as to Exxon's rights to use surface waters should be obtained before a decision to exploit surface runoff is made.

In our opinion, the harvesting of surface runoff waters to supplement operational water use appears to be a viable alternative only if other sources of water are not available.

SURFACE WATER QUALITY

Table 13 shows the quality of water contained in Reservoir 2A and Antelope Reservoir. The lower quality of Reservoir 2A water is believed to be caused by runoff from the waste dumps bordering the reservoir. The quality of surface waters would allow its use for either mill process makeup water or tailings slurry water. If sufficient settling time is allowed either in the reservoirs or intermediate single ponds, suspended solids should not pose a problem.

HIGHLAND WATER SYSTEM

The schematic shown on Plate 3 represents a generalized view of the overall Highland water system. There are three primary sources of water into the system and one secondary source. The primary sources are water pumped from wells, water collected in the underground mine workings, and water collected in the open pits. Surface water collected is considered negligible and is excluded. The secondary source of water is decant water from the tailings pond. Decant water is considered to be secondary, since it is not an original source of water but is rather a source of recycled water.

The data base from which information on the past and present flows of water within the system was collected is somewhat limited. Records of water supplies and uses are not continuous and in some cases are somewhat contradictory. Consequently, flow data for the system over the life of the operation have been developed primarily from estimates based on the best available information including process flow sheets, and relying on sound engineering judgement.

PROJECTED WATER BUDGETS

GENERAL

In developing water budgets for the future operation of the Highland mine and mill, we have divided operational waters into three categories based on water quality and use: well water, process water, and tailings pond decant water.

Well waters are produced by the system of dewatering wells and potable water wells. These waters are required for mill boiler feed and for use in offices, change rooms and shops for the surface and underground facilities. Water quality must be high. The water must meet drinking water standards, since all of these demands are met by the same system.

The second water category is process water. Sources of process water supply are: 1) well water in excess of that required for previously stated purposes, 2) water produced from water-bearing strata being exposed by both underground and open pit mining, and 3) tailings pond water seepage into the open pits. Process water is used in the mill for ore processing operations.

Tailings pond decant water is free water collecting on the surface of the tailings ponds which can be readily decanted for recycling. Tailings pond decant water is differentiated in quality from process water in that the build-up of contaminants in tailings pond recycle water could be detrimental to the uranium extraction process chemistry. Any water management strategy or assessment must be based on both demand and water quality requirements.

Water budgets, listing demand, supply and balance (either positive or negative), will be present for the three stated water categories. A mill expansion from 3,000 dry tons per day (DTPD) to 5,000 DTPD has been set for 1981. The effect of such an expansion on the operational water budgets has been accounted for in the budget years beyond and including 1981.

WELL WATER

Table 14 shows the estimated well water budgets for the years 1977 through 1985.

The dewatering well system is presently in a state of relaxed maintenance, and consequently, the water produced from the west leg of the system (i.e., well numbers 21, 22, 23, 24, 25 and 26) were not considered to be contributing to well water supply for the years 1977 through 1980. Water produced from the west leg is presently fed to stock water reservoirs through intentional discharge and through a major break in the collection pipeline. A relatively small amount of water is also being discharged through Discharge 002. However, it was assumed that the west leg wells would continue to be pumped.

The mill expansion in 1981 increases the demand for well water from 115 gpm to 155 gpm, and it has been assumed that at that time, the dewatering collection system will have been sufficiently upgraded to allow for operational use of all available, high quality, well water.

As the mining operation continues into the future, the production from the dewatering well system decreases. This is due to drawdown of ground water levels from pumpage out of the underground workings and open pits which move closer to the wells with time. The physical expansion of the open pits actually destroys some of the wells and the depletion of the ground water causes a decrease in the production of the remaining wells.

As can be seen from Table 14, the production of well water in the years beyond 1981 is not sufficient to meet the requirements for this category of water supply. The deficit increases with time to a high of approximately 105 gpm in 1985. The continuing increase in deficit is due to the reduction in yield of the wells as ground water depletion continues.

Exxon has reported that the deterioration in radiochemical quality of water produced by Well No. 14 has resulted in the abandoning of that well as a source of potable water for the underground mine. The deterioration of water quality was probably due to the radius of influence of the well expanding into a more radioactive area (the ore body) of the aquifer. This aspect of changing water quality must be considered along with the quantity of well water produced in the future. The deterioration of radiochemical quality should not affect well water use for boiler feed, but it would definitely prohibit use as potable water. It may be advantageous, as well water supplies decrease, to separate the present single potable water system into two systems; one strictly for human use, and one for boiler feed and other uses where human contact is minimal.

PROCESS WATER

Projected water budgets for mill process water are shown in Table 15. The demand for process water is based on a final thickener discharge of 50 percent solids. The 3,000 DTPD mill requires 360 gpm process water in addition to the 90 gpm water supplied by ore moisture (ore assumed to be 15 percent water by weight) and the 50 gpm water applied by the mill boilers. The 5,000 DTPD mill will require 605 gpm to supplement 150 gpm ore moisture and 85 gpm boiler water.

An overflow pipe from the potable water tank to the process water tank allows for the use of excess potable water (well water category) as a supply of process water. Other sources of process water are water produced from water bearing strata intercepted by the underground and open pit mines and seepage from the tailings pond into the open pits. Production of water from the underground mine is expected to peak at about 320 gpm in 1978 and then steadily decline to about 140 gpm in 1985. The water produced by the open pits from water bearing strata is a function of pit size, depth, and location, and, consequently, varies from year to year with a high production of about 575 gpm in 1983 and a low production of about 300 gpm in 1980. Excess well water and tailings pond seepage to the pits are relatively minor sources.

The net balance for process water is a surplus production which decreases fairly slowly from 293 gpm excess in 1977 to 166 gpm excess in 1980. The mill expansion in 1981, with its increased demand of an additional 245 gpm process water, changes the net balance to one approximating a supply equal to the demand. The relative accuracy of projected supply values prohibits a definite statement as to the need for additional sources of process water to meet the additional demands of the expanded mill. The monitoring of current and future water production is highly recommended. This will provide fore-warning of any shortage or excesses developed in the supply of purer water.

TAILINGS POND DECANT WATER

Our projected water budgets for tailings pond decant water are shown on Table 16. The water budgets include projected tailings pond water balances to help define the tailings pond water system.

The quantity of water going into the tailings pond water system is equivalent to the quantity of water contained in the tailings slurry discharged into the pond. Surface runoff waters are considered negligible. Precipitation is included into the evaporation loss computation by using a net evaporation figure. The amount of water contained in the discharge tailings is equal to the water added during the milling process plus the slurry water added to reduce the percent solids of the tailings to 37.5 percent. Thus, the amount of water supplied to the tailings pond through tailings discharge from the 3,000 DTPD mill is 835 gpm. The amount of water from the expanded 5,000 DTPD mill will be about 1,395 gpm.

The water leaving the tailings pond water system is water lost to entrained pore space in the tailings; water lost as seepage to the open pits; water lost as seepage from the tailings pond and not recovered; and water lost through evaporation. The amount of water into the tailings pond minus the total water losses, or water out of the pond, equals the supply of tailings pond decant water.

The demand for decant water is considered to be solely for use as tailings slurry water. Tailings slurry water has been previously defined as that water required for reducing the percent solids of the tailings from 50 percent to 37.5 percent to facilitate tailings transport. The 3,000 DTPD mill requires 335 gpd slurry water and the expanded 5,000 DTPD mill will require 555 gpd slurry water. The present source of slurry water is excess process water. In the future, when there will not be sufficient excess process water to meet slurry water requirements, tailings pond decant water will supply the necessary water to fulfill slurry demand.

Presently, no decant water is used for slurry water. By 1980, it is estimated that about 169 gpm decant water will be used for slurry water. When the mill is expanded to 5,000 DTPD in 1981, essentially all of the additional water required for tailings slurry (555 gpm) must come from tailings pond decant water. A recirculation of water is developed in that once the tailings are deposited into the pond, tailings will settle and release transport water which can then be decanted and recycled to tailings slurry.

The sudden increase in demand for decant water caused by the mill expansion must be taken into account in timing the mill expansion. It appears that the mill expansion will roughly coincide with the demise of the present mill water ponds due to development of Open Pit Number 4. If this is the case, the stored water in the mill ponds may be used as the initial source for the 555 gpm water required for tailings slurry at that time.

At present, the Highland operation is accumulating tailings pond free water at the approximate rate of 150 gpm. The accumulation rate will decrease, and during 1979, the tailings pond water system will be in relative equilibrium.

From 1979 on, the tailings pond will be experiencing a net loss of water from the system. Ths means that once the free water stored in the pond is depleted, the tailings pond will not be able to supply the total amount of decant water demanded for tailings slurry. The additional water that will be required to meet the demand for slurry water is approximatley 50 gpm.

The two primary variables in the tailings pond water balance are seepage and evaporation. The other parameters are essentially fixed.

The amount of evaporation is directly dependent on the amount of evaporative surface area; that is, the surface area of the free water and the wet beaches. If the pond water system is in relative equilibrium, the evaporation component will adjust itself through a change in evaporative surface area to maintain equilibrium. If the system tends to the the accumulation side of the balance, the free water volume will increase and cause an increase in the evaporative surface area which results in an increased evaporation loss, thus checking the tendency toward accumulation. On the other hand, a decrease in pond free water volume due to a net loss of water from the system results in a lower evaporation loss due to a decreased evaporative surface area, thus maintaining the water balance equilibrium. However, the increasing flow of water out of tailings pond due to the increasing seepage loss, and the fixed flow of water into the tailings pond from tailings discharge will prevent the pond from attaining the requisite relative equilibrium.

The continuing increase in seepage loss is based on the premise that the Phase II raise on the current tailings dam will be built to provide future tailings storage capacity. Should another means of tailings disposal be selected by Exxon, such as pit disposal or a new tailings dam, the tailings pond water budgets as presented in Table 16 would no longer be valid estimates. As an alternative, if a new tailings disposal system with more restricted seepage is used in the future, the net loss of tailings pond water would most likely be replaced by a net gain or an accumulation of tailings pond free water. This accumulation of free water could serve as a new source of process water; however, water treatment could be required.

The amount of excess free water which a different tailings disposal system would provide cannot be estimated at this time due to the lack of information on alternative disposal systems.

A summary of the water budgets for all three water categories and a net water balance for the overall system are shown in Table 17. An excess of about 69 gpm is projected for 1978, while 1979 is expected to have a water supply almost equaling the water demand. From 1980 through 1985, the Highland operation is expected to face a water shortage, reaching a high deficit at approximately 170 gpm in 1985. Due to the accuracy of the data used for evolving the projected water budgets, it is recommended that Exxon plan for a net water shortage as early as 1979.

ASSESSMENT OF POTENTIAL WATER TREATMENT METHODS

The need to develop information on water treatment methods has been negated by the study's findings which indicate a future shortage of water rather than the present situation of excess water.

It presently appears that the only future scenario which would require water treatment is the establishment of a new tailings disposal system with a controlled seepage loss. Should this path be chosen by Exxon, the possibility of using excess tailings pond free water as makeup for mill process water would exist. To investiate water treatment methods for such a possibility at this time appears moot. Should future Exxon decisions include the necessity for water treatment, such methods as ion exchange, reverse osmosis, electrodialysis, and chemical and physical treatment could be investigated.

ALTERNATIVE ADDITIONAL WATER SOURCES

A number of options are available to supply the projected water shortages at the mill. Sufficient ground water supplies are available in the vicinity; therefore, selection of the most economic alternatives is of prime concern. The main future water shortage will be for high quality (potable) water currently obtained from the well system. This shortage is projected to develop after 1981 and is estimated to reach 105 gpm by 1985, as shown on Table 17. Total water shortages are projected to reach a maximum of about 170 gpm by 1985.

The quality of the water which must be supplied by the potable water supply system must meet drinking water standards since a portion is consumed or used for showering, etc. A portion of this high quality water requirement, as shown on Table 17, could be met with water of somewhat lower quality where human contact is not involved, such as for boiler feed water. Boiler feed water constitutes the major demand for high quality water, but water with radium-226 in excess of human standards could be used. A separate water tank and piping system would be required to separate these uses, however.

Consideration should be given to pumping water produced from the Highland West underground mine to the mill. Based upon water quality information from the North Morton area, it is expected that water produced from the ore bearing zone at Highland West will slightly exceed recommended drinking water standards for sulfate (250 mg/l), and that some of the water will exceed drinking water standards for radium-226 (approximately 5 pCi/l). Water produced from dewatering wells will likely be of higher quality than that produced within the mine, due to lower suspended solids and bacteriological contamination, and possibly lower radiological constituents. Water quality of aquifers above the ore zone is expected to be about the same or slightly better than in the ore zone. Although it is not possible to determine the amount of water which will be produced at Highland West at this time, it is expected that on the order of 200 gpm will be produced from the underground mine. Shortterm flows may be several times this amount as initial development occurs. Dewatering wells associated with the mine may produce an additional 200 to 500 gpm depending on the number used. Since the main projected shortage at the mill will begin after 1982, nearly all of initial water production and a portion of subsequent production will be in excess to needs and will require discharge. Radium-226 will likely be the contaminant of main concern for discharge. Dewatering wells associated with the Highland West underground mine will likely produce the required quantity and high quality of water needed at the mill. Possibly not all dewatering wells should be included in such a mill supply system because of variability in ground water quality. A pipeline from four to six miles in length from the mill to Highland West would be required. Remaining low quality water would have to be treated and discharged.

An alternate to this action would be to discharge the better quality water from Highland West, thereby reducing or eliminating the need for treatment, and to pump the remaining lower quality water to the mill. Since this poorer quality water would not likely meet the culinary quality demands at the mill, separation of culinary quality demands from the other quality demands would be required as discussed previously.

A third alternative would be to construct new water production wells in the mill vicinity, and to treat as necessary and discharge water produced at Highland West. New wells could be instructed in deeper aquifers, or in the same aquifer as the present wells, but at greater distances than if deeper aquifers were tapped. Information available for the site region (Table 1) indicates that deeper aquifers in the Fort Union Formation should be capable of yielding 100 gpm or more to individual wells. Drilling depths on the order of 1,000 to 1,500 feet will be required. The chemical quality of the water produced from such wells would be expected to be somewhat lower than the water produced from the existing wells, and may be marginal with respect to drinking water standards for sulfate. If wells were constructed in the same aquifer as the existing wells, water quality would be expected to meet culinary standards. The wells should be located at least one mile from the open pits and underground mine. The depth of these wells would range from 500 to 700 feet. Locations west of the mill would be most favorable from the aspects of distance from the mill and highest available drawdowns. Yields of 50 gpm are expected. If no water from Highland West was to be used at the mill, three deep wells or six shallow wells should be assumed for planning purposes. This number of wells should provide about 100 gpm reserve capacity in the system.

RECOMMENDATIONS AND CONCLUSIONS

We recommend that a comprehensive water monitoring program be initiated which will serve to further evaluate water production, consumption, and accumulation or loss. Discharges from the dewatering well system, from the open pits, and from other sources, should be monitored. Changes in water levels in the tailings pond and other storage pools should periodically be recorded in order to estimate changes in storage. Water levels in several unused water wells should be recorded at least four times per year. This information will help assess on-going water situations, and will provide early warning of problems.

We recommend that the existing dewatering well system be repaired and integrated into the system. Well Nos. 11, 13, 22 and 24 will likely provide 15 to 30 gpm each of water of quality suitable for culinary use in the future. Well Nos. 15 and 16 should produce 10 to 30 gpm each of water which exceeds drinking water standards for radium-226. These wells could be used to provide water to the process water tanks, tailings pond, or boiler feed. All existing wells may need to be cleaned to increase efficiency and yield. Replacement of large pumps in these wells with smaller, properly-sized pumps should reduce cycling and maintenance problems.

We recommend that the feasibility of separating waters to be used for human contact from waters to be used for boiler feed and other uses not requiring drinking water standards be determined so that maximum utilization of the water produced at Highland West can be made evaluated in detail.

Preliminary plans to construct either the deep or shallow new wells discussed in the previous section should be made in order that the wells can be constructed in a minimum of time, if required.

Continuing evaluation of mining plans and dewatering requirements at Highland West should be made so that the feasibility and cost-effectiveness of utilizing water produced there can be made.

Sufficient water is readily available to supply the projected shortage at the mill. It appears that discharge of at least several hundred gallons per minute from Highland West will be required even if water is used for the mill. Utilization of a portion of the water produced at Highland West at the mill can reduce or eliminate necessary treatment.

oOo

The following are attached and complete this report:

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TABLE 1

STRATIGRAPHIC DESCRIPTION

Formation	Age	Description	Water Bearing Properties
Alluvium	Quaternary	Silt, sand, gravel, and clay, unconsolidated. Mostly less than 50 feet thick. Occurs mostly in valley bottoms.	Yields of a few gpm expected. Water quality probably fair.
Wasatch Formation	Eocene	Lenticular sandstone, fine- to coarse-grained, and interbedded shale and coal. Coarse-grained rock proportionately greater toward south part of basin. Thickness about 1,575 feet in Pumpkin Buttes area, becoming generally thinner toward basin margins. Forms surface of most of central part of basin.	Yields water from lenticular sandstone, and to a lesser extent from jointed coal and clinker beds. Yields can be expected to range from 10 to 50 gpm in vicinity. Dissolved solids commonly range between 200 and 1,000 mg/l. Sodium sulfate and sodium bicarbonate are the dominant water types.
Fort Union Formation	Paleocene	Sandstone, fine-grained, and interbedded shale, carbonaceous shale and coal. Thickness about 2,900 feet in southwest part of basin.	Yields water from fine-grained sandstone, jointed coal, and clinker beds. Maximum yields are about 150 gpm. Specific capacity expected to range from 0.5 to 1.5 gpm per foot. Dissolved solids commonly range between 500 and 1,500 mg/l. Water type is mostly sodium bicarbonate, and to a lesser extent sodium sulfate.
Lance Formation	Cretaceous	Sandstone, fine-to coarse-grained, and interbedded sandy shale and claystone. Thickness is about 3,000 feet in southern Converse County.	Generally yields less than 20 gpm, but yields of several hundred gallons per minute may be possible from the complete section of the formation. Most wells have been drilled in outcrops of the Lance for domestic and stock purposes and tap only a small part of the formation. The specific capacity of three wells in Crook County ranged from 0.4 to 1.7 gpm per foot of drawdown. Dissolved solids ranged from about 200 to more than 2,000 mg/l, but commonly range between 500 and 1,500 mg/l. No information on water-bearing properties in site vicinity.
Fox Hills Sandstone	Cretaceous	Predominately sandstone, fine- to medium-grained, containing thin beds of sand shale; thickness is about 700 feet in southwest part of basin.	Yields of as much as 200 gpm are available from sandstone beds in east part of basin. Several wells south of Rozet produce about 200 gpm from the Fox Hills for water flooding. A well in Campbell County flows 75 gpm from a depth of about 2,000 feet, and has a shut-in pressure of 54 psi at the surface. Maximum yields in west part of basin will probably be less than 100 gpm. A well in Natrona County had a specific capacity of only 0.37 gpm per foot of drawdown. Dissolved solids are mostly less than 1,000 mg/l in east part of basin, but generally range between 1,000 and 2,000 mg/l in west part. No dominant water type is prevalent.
Older Rock		Shale, sandy shale and fine-grained sandstone and other sedimentary rock at greater depth.	The great depth and likely poor water quality preclude these formations from being of economic interest.

TABLE 2

PUMPING TEST ANALYSES FOR WELLS ON EXXON PROPERTY

Well	Average Pumping Rate (GPM)	Length of Test (days)	Drawdown at End of Test (feet)	Aquifer or Screened Thickness (feet)	Specific Capacity (gpm/ft)	Calculated Transmissivity (gpd/ft)	Permeability (ft/yr)	Calculated Storage Coefficient	Method of Analysis
D&M T.W.[a]	55	2.3	65	65	0.85	3,300	2,500	--	J
D&M 3A[b]	--	2.3	8.4	60	--	5,400	4,400	1.2×10^{-5}	J
D&M 5A[b]	--	2.3	11.1	65	--	9,000	6,800	--	J
Dewatering #4	52	4.9	85	103	0.61	773	366	--	H
Dewatering #10	47	0.19	57	130	0.82	860	323	--	M
TW #1	9.9	0.33	90	55	0.11	350	310	--	A
TW #2	82	0.33	63	120	1.3	2,300	940	--	A

[a] Pumping well

[b] Observation well

[c] J - Jacob Method
A - Aron-Scott Method
H - Horner Method
M - McKinley Method

TABLE 3

SUMMARY OF PILOT AREA CORE DATA (MIDDLE SAND)

Well	Sand Thickness (Feet)	Average Permeability (md)	Porosity
1	22	1,011	.30
2	24	776	--
3	31	1,341	.30
4	26	774	--
5	22	707	.29
6	24	1,270	--
Inj.	24	1,250	.28
A	22	551	--
B	26	1,024	--
C	29	1,234	--
D	24	910	--
E	22	834	--
F	22	1,142	--
	Average:	986 $\pm$250	

TABLE 4

SUMMARY OF PILOT AREA PULSE TEST DATA

Well Pair	Average Sand Thickness (feet)	Average Permeability (md)
Inj-1	23	1,104
Inj-2	24	1,212
Inj-3	27.5	910
Inj-4	25	1,326
Inj-5	23	1,645
Inj-6	24	1,265
	Average:	1,244 $\pm$245

TABLE 5

SUMMARY OF PUMP TEST RESULTS
NORTH MORTON

Test Well No.	Total Drilled Depth (ft)	Perforated Intervals (ft)	Static Water Level Depth (ft)	Pumping Water Level Depth (ft)	Average Production Drawdown (gpm)	Range of Transmissivity (gpd/ft)	Estimated Average Permeability (ft/yr)
DM-1	716	544-574 574-584 595-605 618-648 664-674 685-695	333.5	439.0	73	1,000 - 3,600	580
DM-4	650	523-558 598-618	307.2	420.5	44	640 - 11,000	740
DM-5	640	531-541 543-558 558-578 580-590 590-605	303.1	408.2	73	1,000 - 6,300	760
DM-6	640	527-547 552.5-562.5 562.5-587.5	309.8	438.0	31	320 - 4,000	490
DM-8	742	527-547 580-600 652-672 694-704 704-709	365.8	425.8	29	640 - 2,700	600
Morton Ranch Water Well	680.5	525-648	291.0	311.0*	18*	1,400 - 3,000	--

* After 5 hours of pumping.

TABLE 6

SUMMARY OF PIEZOMETER TEST DATA[a]
NORTH MORTON RANCH

PIEZOMETER NUMBER	TOTAL DEPTH (FT)	PERFORATED INTERVAL (FT)	STATIC WATER LEVEL DEPTH (FT)	AIRLIFT PRODUCTION (GPM)	TRANSMISSIVITY (GPD/FT)	ESTIMATED PERMEABILITY (FT/YR)
DM-1A	280	240-260	140.1	6.0	820	2,000
DM-4A	240	190-210	109.9	2.0	120	240
DM-5A	300	260-280	104.9	2.5	16	--
DM-8A	290	250-270	170.9	4.0	42	190
MX 2684A	285	--	125.1	--	--	--
MX 2685A	180	--	120.3	--	--	--
MX 2686A	180	--	100.0	3.0	180	--
MX 2687A	280	--	178.7	1.5	4	--
DM-1B	420	380-400	208.7	7.5	200	390
DM-4B	440	400-420	178.5	2.5	7	68
DM-5B	460	400-420	147.3	0.5	0.6	15
DM-6B	380	340-360	125.5	4.5	38	93
MX 2684B	475	--	274.2	--	--	--
MX 2685B	475	--	295.1	--	--	--
MX 2686B	360	--	122.7	1.0	6	--
MX 2687B	360	--	174.5	3.0	4	--
DM-SP1	680	540-560 600-620	319.0	10.0	900	1,100
DM-SP2	630	452-502 532-582	289.7	5.0	120	--
DM-1P	700	560-580 620-640	327.9	8.0	870	1,100
DM-2P	740	580-600 660-680	369.1	6.5	780	950
DM-3P	700	580-620	332.1	10.0	600	810
DM-4P	640	520-540 600-620	307.1	10.5	920	1,100
DM-5P	660	540-560 580-600	292.5	12.0	1,400	1,700
DM-5P2	640	540-560 580-600	293.4	9.0	1,400	1,700
DM-6P	660	560-600	308.7	8.0	570	790
DM-7P	740	580-600 640-660	367.6	6.5	610	990
DM-8P	740	580-600 650-670	364.0	7.0	780	950
DM-9P	740	640-660 700-720	373.6	6.0	360	440
MX 2684	600	--	305.4	--	--	--
MX 2685	560	--	342.8	--	--	--
MX 2686	620	--	266.5	0.5	0.1	--
MX 2687	710	--	366.7	6.0	660.	--

[a] Data Obtained March - June 1975.

TABLE 7

CHEMICAL GROUND WATER QUALITY DATA

Dewatering Well No.	Sodium (Na)	Potassium (K)	Calcium (Ca)	Magnesium (Mg)	Sulfate (SO_4)	Chloride (Cl)	Bicarbonate (HCO_3)	Total Dissolved Solids
	Concentration in mg/l							
12	89	19	31	7	104	18	232	382
13	77	7	36	11	104	10	232	359
14	72	21	36	6	88	18	220	349
15	62	22	38	8	90	12	220	340
16	76	7	35	12	105	8	232	357
17	69	10	54	8	126	14	220	389
18	69	21	52	8	134	14	220	406
19	60	10	55	12	130	10	220	385
20	62	11	56	7	104	14	232	368
21	54	8	58	12	112	10	232	368
22	81	28	38	10	144	20	207	423
23	76	51	24	6	110	22	207	391
24	63	52	50	10	100	68	207	445
25	99	252	84	11	104	360	232	1,027
26	108	228	72	11	74	350	220	951

Sample Dates:

Aug 8, 1974	Well No. 12
May 21, 1974	Well Nos. 13-15, 17 & 18, 20-26
Oct 25, 1974	Well Nos. 16 & 19

TABLE 8

RADIOCHEMICAL GROUND WATER QUALITY DATA[a]

Dewatering Well No.	Alpha (pCi/l)		Beta (pCi/l)		U-nat (pCi/l)		Ra-226 (pCi/l)		Th-230 (pCi/l)	
	1974	1976	1974	1976	1974	1976	1974	1976	1974	1976
11		9.5		19.1		5.48		4.60		.27
12	38.2	4.3	23.0	10.1	10.0	2.67	1.4	2.43	1.25	.08
13	12.0	5.1	7.0	15.8	27.6	1.83	1.7	.86	1.85	.63
14	9.5		9.0		15.0		1.4	.89[b]	1.95	
15	107.5	74.6	39.0	124.2	22.5	9.33	83.0	83.39	.2	.49
16	80.0		36.5		15.5		52.0		1.8	
17	21.0	10.2	20.0	26.3	18.0	8.42	5.1	.81	.9	.15
18	19.0	3.4	16.0	13.9	41.0	3.16	1.1	2.31	.9	.26
19	35.0	1.1	9.0	6.3	66.0	3.78	2.4	.62	.2	.17
20	25.0	28.5	23.0	36.5	111.5	8.73	.85	1.75	117.05	.49
21	23.5	22.3	18.5	33.1	60.85	11.89	4.05	1.36	1.25	.22
22	10.35	.2	29.5	2.0	15.35	1.35	1.3	.67	.85	.17
23	5.35	2.0	28.5	.9	8.5	4.36	.65	1.31	.05	.36
24	19.0	8.0	14.0	21.5	25.0	4.88	4.85	2.29	1.65	.63
25	10.10	5.1	15.5	15.7	23.0	3.80	2.2	15.49	.30	.45
26	4.80	8.6	8.5	18.5	11.35	7.61	1.5	2.38	.45	.3

[a] 1974 data are averages except Well Nos. 17, 18 & 19.

[b] 1976 data were taken in August 1976.

TABLE 9

DEWATERING WELL DATA

Well No.	Collar Elevation (feet)	Total Depth (feet)	Screened[a] Internal (feet)	Total Depth (feet)	Operating Water Level Elevation (feet)
11	--	--	--	--	--
12	5,420	704	440 - 651	672	4,764
13	5,395	654	414 - 601	604	4,807
14	5,352	648	404 - 601	609	4,759
15	5,345	597	343 - 554	567	4,794
16	5,312	557	289 - 504	525	4,803
17	5,266	467	252 - 414	441	4,841
18	5,277	544	241 - 462	514	4,779
19	5,345	589	--	567	4,794
20	5,353	531	--	504	4,865
21	5,367	571	379 - 518	546	4,837
22	5,360	618	379 - 575	588	4,788
23	5,418	700	458 - 650	672	4,762
24	5,394	706	453 - 653	782	4.738
25	5,400	692	448 - 639	672	4,744
26	5,462	709	490 - 656	672	4,806
4	5,386	600	455 - 600	576	4,955

[a] From construction plans - interval includes blank sections.

TABLE 10

ESTIMATED PAST AND PRESENT PUMPAGE RATES FROM

DEWATERING WELLS

- (Gallons Per Minute) -

Dewatering Well No.	Time Period						
	1/74 to 7/74	7/74 to 1/75	1/75 to 7/75	7/75 to 1/76	1/76 to 7/76	7/76 to 1/77	1/77 to 7/77
11	30.	30.	30.	30.	30.	30.	30.
12	0.	40.	40.	33.	26.	12.	5.
13	50.	50.	50.	47.	44.	41.	35.
14	50.	50.	50.	41.	32.	23.	15.
15	0.	50.	50.	48.	46.	44.	40.
16	30.	30.	30.	0.	0.	0.	30.
17	40.	40.	40	20.	0.	0.	0.
18	100.	100.	100.	50.	0.	0.	0.
19	50.	50.	50.	25.	0.	0.	0.
20	0.	60.	60.	54.	48.	42.	30.
21	70.	70.	70.	64.	58.	52.	40.
22	70.	70.	70.	62.	54.	46.	30.
23	30.	30.	30.	25.	20.	15.	5.
24	0.	40.	40.	40.	40.	40.	40.
25	0.	30.	30.	15.	0.	0.	0.
26	0.	40.	40.	33.	26.	19.	5.

TABLE 11

ESTIMATED GROUND WATER PRODUCTION

(Gallons Per Minute)

Elapsed Time Since Start of Pumping (Days)	Period Ending (Date)	Net Pits[a]	Underground Mine	Dewatering Wells	Total
182.	1/73	105.	0.	0.	105.
365.	7/73	125.	20.	0.	145.
547.	1/74	140.	24.	0.	164.
730.	7/74	185.	32.	520.	737.
912.	1/75	170.	44.	780.	994.
1,095.	7/75	130.	56.	780.	966.
1,277.	1/76	305.	108.	780.	1,193.
1,460.	7/76	370.	160.	425.	955.
1,642.	1/77	410.	228.	370.	1,008.
1,825.	7/77	390.	268.	305.	963.
2,190.	7/78	320.	320.	250.	890.
2,555.	7/79	340.	288.	211.	839.
2,920.	7/80	300.	288.	203.	791.
3,286.	7/81	390.	280.	168.	838.
3,651.	7/82	485.	200.	117.	802.
4,016.	7/83	570.	160.	70.	800.
4,381.	7/84	500.	160.	70.	730.
4,746.	7/85	530.	140.	50.	720.

[a] Does not include seepage from tailings pond.

TABLE 12

HIGHLAND VICINITY SURFACE WATER PRODUCTION

Reservoir	Basin Area (Sq. Mi.)	Max. Res. Area (Ac.)	Max. Res. Volume (Ac. Ft.)	Evap.[a] (Ac. Ft.)	Seepage[a,c] (Ac. Ft.)	Runoff (Ac. Ft.)	Available Water (Ac. Ft./Yr.)	Available Water (GPM)
				ANNUAL				
2A	13.4	16.2	141	29[b]	89	154[d]	36	22
Antelope	3.1	3.6	20	7[b]	20	36[d]	9	5
						TOTAL		27
				APRIL-JUNE				
2A	13.4	16.2	141	10[e]	22	66[f]	34	84
Antelope	3.1	3.6	20	2[e]	5	15[f]	8	20
						TOTAL		104

[a] Water surface area is assumed to be half the maximum reservoir area.

[b] Annual net evaporation is 43.5 inches.

[c] Seepage is 11 inches per month (calculated from WSP 1531 data).

[d] Annual runoff is 11.5 acre-feet per square mile.

[e] Net evaporation for April through June is 14.4 inches.

[f] Runoff for April through June is 4.9 acre-feet per square mile.

TABLE 13

WATER QUALITY OF SURFACE RUNOFF WATERS

Reservoir	Radiochemical[a]					Chemical (mg/l)[b]									
	Total Alpha (pCi/l)	Total Beta (pCi/l)	U-nat (Ci/ml)	Ra_{226} (Ci/ml)	Th_{230} (Ci/ml)	Na	K	Ca	Mg	SO_4	Cl	CO_3	HCO_3	TDS	pH (units
2A	250	125	115	4.4	1.8	135	13	83	18	324	30	12	232	730	8.2
Antelope	13.5	19.6	16.6	0.3	2.6	45	4	47	12	143	8	--	134	325	8.1

[a] Radiochemical analysis of 4/19/77.

[b] Chemical analysis of 5/9/77.

TABLE 14

PROJECTED WATER BUDGETS FOR WELL WATER

Year	Demand[a]	Supply[c]	Balance[f]
	Gallons Per Minute		
1977	115	185[d]	+70
1978	115	154[d]	+39
1979	115	131[d]	+16
1980	115	123[d]	+ 8
1981	155[b]	168[e]	+13
1982	155	117[e]	-38
1983	155	70[e]	-85
1984	155	70[e]	-85
1985	155	50[e]	-105

[a] For use by mill boilers and by offices, change rooms and shops for both surface and underground facilities.

[b] Mill expansion to 5,000 DTPD.

[c] Although the quality of water from the dewatering wells and the potable wells varies, all well water is placed in this category.

[d] The production from dewatering wells nos. 21, 22, 23, 24, and 26 was lost to stock ponds or to Discharge 002.

[e] All well water is used, i.e., no discharge to stock ponds or 002.

[f] If an excess of well water exists, it is carried over as a supply to process water.

Table 15

PROJECTED WATER BUDGETS FOR PROCESS WATER

(Gallons Per Minute)

Year	Water Sources					Losses[c]	Supply[e]	Demand[f]	Balance[h]
	Excess Well Water	Underground Mine	Pit Produced	Seepage[a] To Pits	Total				
1977	70	268	390	100	828	133[d]	695	360	+335
1978	39	320	320	75	754	115	639	360	+279
1979	16	288	340	55	699	115	584	360	+224
1980	8	288	300	45	641	115	526	360	+166
1981	13	280	390	45	728	115	613	605g	+ 8
1982	--	200	485	30[b]	715	115	600	605	- 5
1983	--	160	575	30[b]	765	115	650	605	+ 45
1984	--	160	500	30[b]	690	115	575	605	- 30
1985	--	140	530	30[b]	700	115	585	605	- 20

[a] Estimated tailings pond seepage into open pits. This water is in addition to water produced by the pits from water-bearing strata ("pit-produced" column).

[b] Assumes Phase II raise on existing tailings dam.

[c] Losses are due to evaporation and seepage from the mill ponds. The present mill ponds will be lost to mining pits in 1981; it is assumed that new surge ponds with similar losses will be used past 1981.

[d] Includes 18 gpm lost to evaporation from temporary water storage in Pit No. 1.

[e] Supply equals water sources total minus losses.

[f] Water required by the mill for ore processing, does not include water added for tailings slurry after thickener discharge. water retention.

[g] Mill expansion to 5,000 DTPD.

[h] If an excess exists, it is used as tailings slurry water and thus is carried over to the tailings pond water balance as part of tailings discharge water.

TABLE 16

PROJECTED WATER BUDGETS FOR TAILINGS POND DECANT WATER

(TAILINGS POND WATER BALANCES)

Gallons Per Minute

Year	Water In: Tailings Discharge Water[a]	Water Out: Pore Space	Water Out: Seepage To Pits	Water Out: Lost Seepage[c]	Water Out: Decant For Slurry[a]	Water Out: Evaporation[d]	Water Out: Total	Supply[e]	Demand[f]	Balance[g]
1977	835	180	100	200	42	205	685	150	0	+150
1978	835	180	75	215	56	240	710	125	56	+ 69
1979	835	180	55	230	111	260	725	110	111	- 1
1980	835	180	45	245	169	260	730	105	169	- 64
1981	1,395	300	45	260	547	260	865	530	547	- 17
1982	1,395	300	30[b]	275[b]	555	255	860	535	555	- 20
1983	1,395	300	30[b]	290[b]	510	250	870	525	510	+ 15
1984	1,395	300	30[b]	305[b]	555	255	890	505	555	+ 50
1985	1,395	300	30[b]	320[b]	555	235	885	510	555	- 45

[a] 3,000 DTPD requires 360 gpm process water plus 90 gpm ore moisture plus 50 gpm boiler water plus 335 gpm slurry water to discharge at 37.5 percent solids. 5,000 DTPD (1981-1985) requires 605 gpm plus 150 gpm plus 85 gpm plus 555 gpm, respectively, for 37.5 percent solids. Excess process water is used for slurry water with decant providing the remaining required slurry water.

[b] Assume Phase II raise on existing tailings dam.

[c] Lost seepage equals gross seepage minus seepage to pits minus dam seepage reclaim.

[d] Evaporation based on 2.25 gpm per acre of evaporative surface area. Future surface areas are estimated based on engineering judgement considering water accumulation rates.

[e] Supply equals "water in" minus "total water out".

[f] Demand is the amount of decant water required for tailings slurry. Excess process water is considered a higher priority source for slurry water; consequently, decant demand is slurry water required above that amount already provided by excess process water.

[g] Water accumulating at a rate of 100 gpm over 100 acres per one year rises 1.6 feet.

TABLE 17

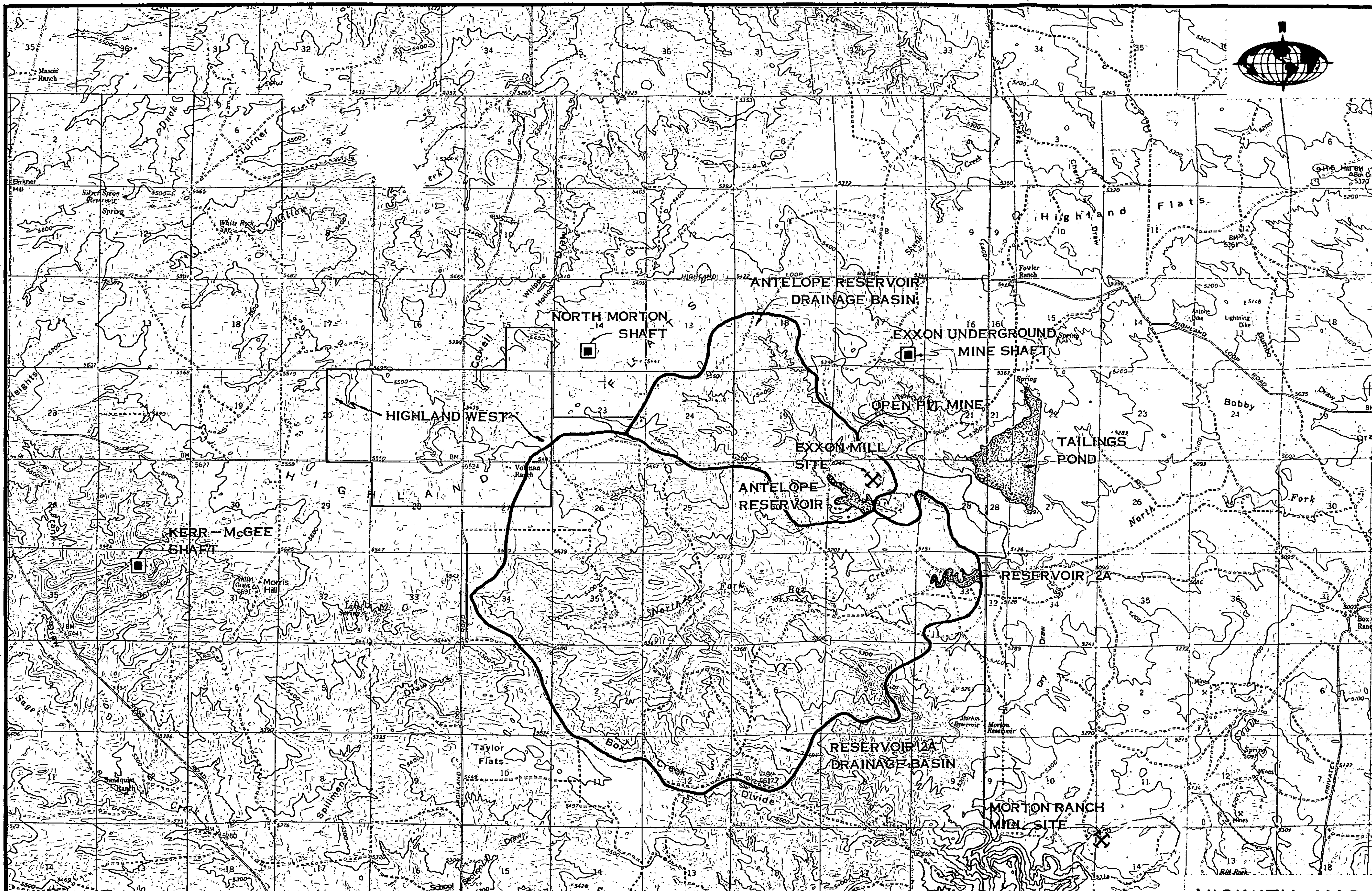
PROJECTED OPERATIONAL WATER BUDGETS

Gallons Per Minute

	Well Water			Process Water			Tailings Pond Decant Water[c]			
Year	Supply	Demand	Balance	Supply	Demand	Balance	Supply	Demand	Balance	Net Balance[a]
1977	185	115	+ 70	653	360	+293	150	0	+150	+150
1978	154	115	+ 39	639	260	+279	125	56	+ 69	+ 69
1979	131	115	+ 16	584	360	+224	110	111	- 1	- 1
1980	123	115	+ 8	526	360	+166	105	169	- 64	- 64
1981	168	155	+ 13	613	605	+ 8	530	547	- 17	- 17
1982	117	155	- 38	600	605	- 5	535	555	- 20	- 63
1983	70	155	- 85	650	605	+ 45	525	510	+ 15	-85, +15[b]
1984	70	155	- 85	575	605	- 30	505	555	- 50	-165
1985	50	155	-105	585	605	- 20	510	555	- 45	-170

[a] Excesses in a higher water quality category are carried to next lower quality category; therefore, excesses are not cumulative. Since shortages cannot be carried over, shortages are cumulative.

[b] A shortage of 85 gpm well water and an excess of 15 gpm tailings decant water.



REFERENCE:

U.S.G.S. MAPS TITLED "BILL, WYOMING" AND "HIGHLAND FLATES, WYOMING"

MILES 1 0 1 2

VICINITY MAP

DAMES & MOORE

466.12 (4-64)

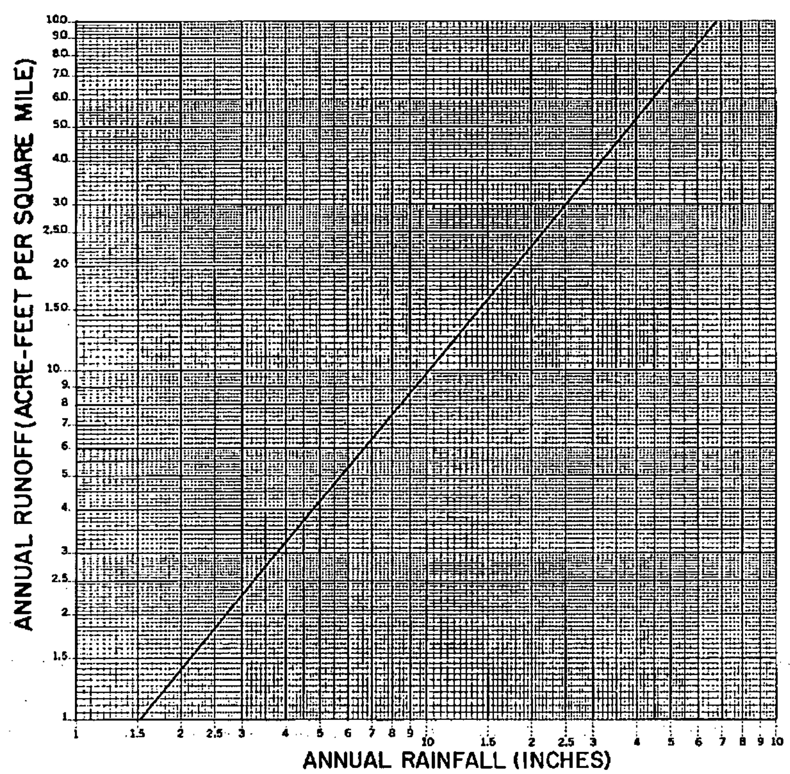


FIGURE 1. RAINFALL-RUNOFF CURVE FOR WASATCH FORMATION

Mean Annual Runoff is 11.5 Acre Feet Per Square Mile
Precipitation Record for Casper, Wyoming 1940-1975

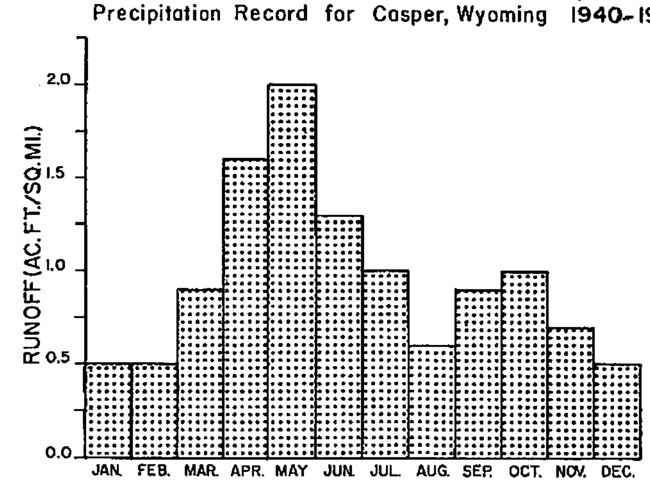


FIGURE 2. MONTHLY RUNOFF DISTRIBUTION FOR WASATCH FORMATION

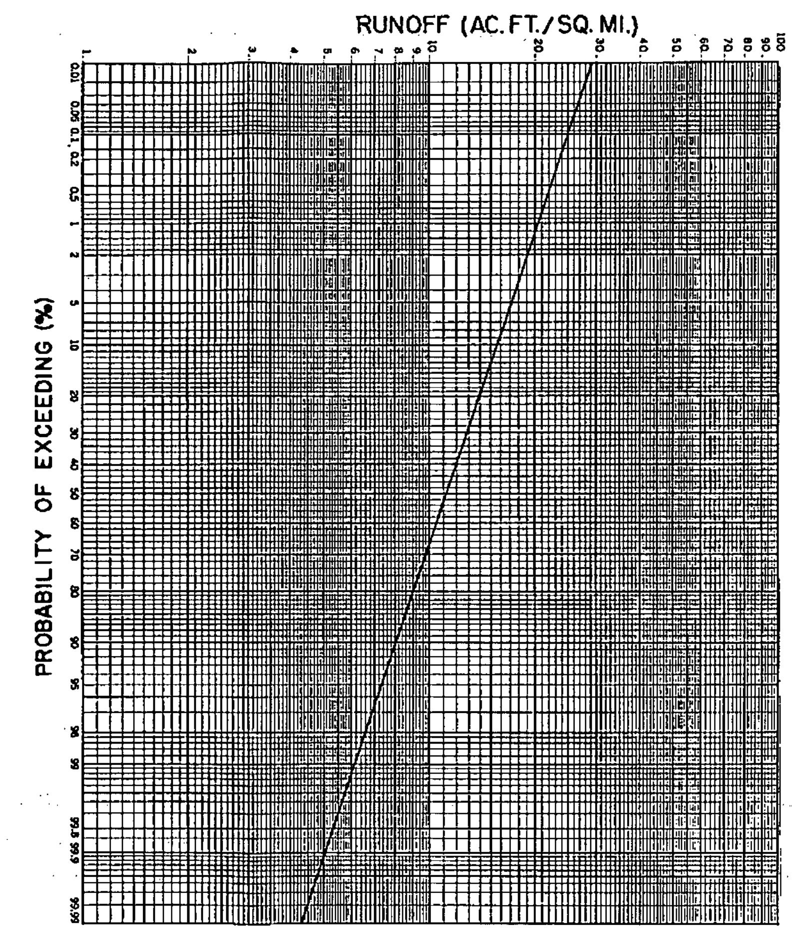
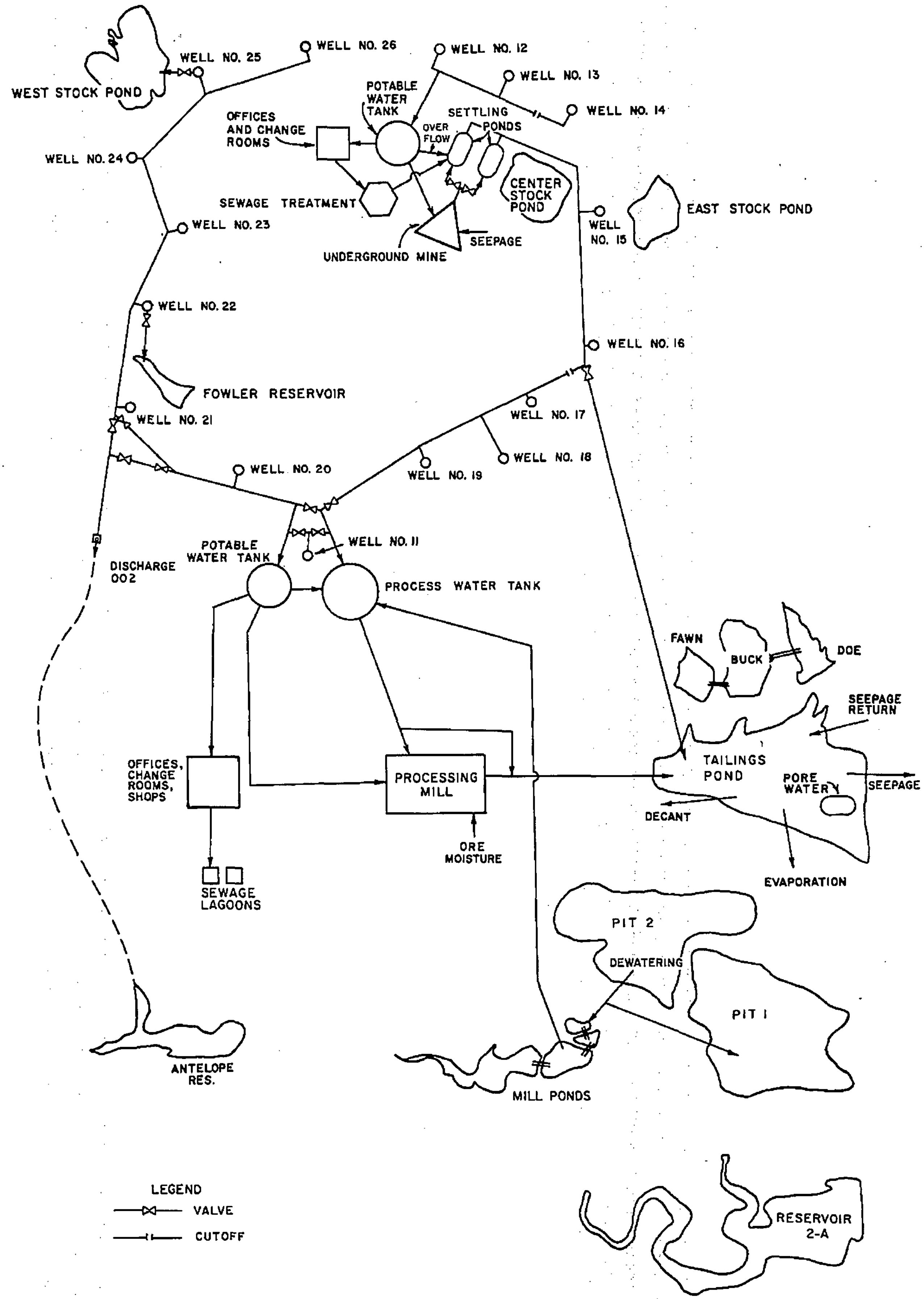


FIGURE 3. PROBABILITY OF VOLUME OF ANNUAL RUNOFF

RUNOFF FIGURES

DAMES & MOORE



SCHEMATIC OF EXXON HIGHLAND WATER SYSTEM

DAMES & MOORE

PLATE 7

REVISIONS BY ___ DATE ___ BY ___ DATE ___ PLATE ___ OF ___

FILE 08837-050-06 Exxon, Casper BY Smith DATE 9-13-78 CHECKED BY LCC DATE 3-15-79

APPENDIX A

GROUND WATER MODEL DETAILS

A description of the ground water model is presented in the text. This appendix presents details of input and output parameters of the computer model, as provided on Table A-1.

The locations of dewatering wells and wells used to simulate pumpage from the underground workings and open pit are shown on Plate A-1, enclosed in the pocket at the back of this report. Wells located within a pit outline shown on Plate A-1 at any given time period were used to simulate pumpage from that pit.

Table A-2 shows the effective drawdowns used in the analysis for the open pits at any given time period.

Table A-1 is the final computer printout which lists all computer input and output. Input parameters are listed under the portion of the printout under the heading "Date", and include transmissivity, storage coefficient, pumping well location, and pumping rates for the various pumping periods. Resulting ground water drawdowns are tabulated starting on Page 10 of the printout under the heading "Results". As explained in the text, pumping rates were determined, by trial and error methods, which resulted in achieving the required effective drawdowns.

For the purposes of the model, pumping was assumed to begin in mid-1972. It was extended into the future by 24 pumping periods. These pumping periods, listed as days since mid-1972, read from left to right across the printout page. Periods 182. to 1,825. bring the ground water model up to the present in intervals of 182. days. Periods 2,190. to 4,746. extend the model to mid-1985 in 365 day increments. Periods 5,111. to 6,937. show the rebound of the water table with time into the year 1991.

A total of 229 pumping wells were used to simulate the open pits, the underground mine shaft, and the dewatering wells. Pumping wells are prefixed by the letter "P" followed by a number from 1 to 5, which corresponds to locations within the five proposed pits. A two digit numbering system follows this prefix. The four wells which simulate the output of the shaft and underground workings are labeled SH01 through SH04. The dewatering wells are prefixed by the letters "PW" and are numbered from 11 to 26. The pumping rates for the shaft and the dewatering wells were extrapolated from data provided by Exxon. The pumping rates for the pits were determined by trial and error to match anticipated effective drawdowns.

Observation wells were established at the location of each dewatering well and well simulating pumpage from the pit and shaft. The computed drawdowns for each of these wells are tabulated under the heading of "Results". The drawdown level of the dewatering wells, which are presently active, was held constant at the present level during future periods. The drawdown levels of the shaft and underground workings reach a maximum in Period 3,286., and then rebound slightly in response for expected underground mining development.

@RUN,W DAMESM,858100/ ,EXXON,60,50/300
DATE: 022778 TIME: 225900

@ASG,A POKA

@XQT,OU POKA.ABS
DAMES AND MOORE COMPUTER PROGRAM EP 17A
WATER LEVEL DRAWDOWN IN A HOMOGENEOUS LEAKY AQUIFER

08837 050 021578 EXXON

TABLE A–1
COMPUTER PRINTOUT
GROUND WATER MODEL

= = DATA = =
START OF PUMPING = 07 72
TOTAL NUMBER OF PUMPING PERIODS = 24
TRANSMISSIVITY (GPD/FT) = 4500.0
STORAGE COEFFICIENT = .003500
VERTICAL LEAKAGE FACTOR, P'/M'= (GPD/CU.FT.) = .0000000
TOTAL NUMBER OF PUMPING WELLS = 229
COORDINATE UNITS (FT/UNIT) = 10.

PUMPING WELLS --- AVERAGE PUMPING RATE (GPM)

WELL NO	COORDINATES X	Y	ELAPSED TIME (DAYS) 182.00 / 2920.00	365.00 / 3286.00	547.00 / 3651.00	730.00 / 4016.00	912.00 / 4381.00	1095.00 / 4746.00	1277.00 / 5111.00	1460.00 / 5476.00	1642.00 / 5841.00	1825.00 / 6207.00	2190.00 / 6572.00	2555.00 / 6937.00
SH01	675.	8075.	.0	5.0	6.0	8.0	11.0	14.0	27.0	40.0	57.0	67.0	80.0	72.0
			72.0	70.0	60.0	50.0	50.0	40.0	.0	.0	.0	.0	.0	.0
SH02	675.	7925.	.0	5.0	6.0	8.0	11.0	14.0	27.0	40.0	57.0	67.0	80.0	72.0
			72.0	70.0	40.0	30.0	30.0	30.0	.0	.0	.0	.0	.0	.0
SH03	525.	7925.	.0	5.0	6.0	8.0	11.0	14.0	27.0	40.0	57.0	67.0	80.0	72.0
			72.0	70.0	40.0	30.0	30.0	30.0	.0	.0	.0	.0	.0	.0
SH04	525.	8075.	.0	5.0	6.0	8.0	11.0	14.0	27.0	40.0	57.0	67.0	80.0	72.0
			72.0	70.0	60.0	50.0	50.0	40.0	.0	.0	.0	.0	.0	.0
PW11	410.	7695.	.0	.0	.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	25.0
			25.0	20.0	10.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
PW12	615.	8315.	.0	.0	.0	.0	40.0	40.0	33.0	26.0	12.0	5.0	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
PW13	725.	8265.	.0	.0	.0	50.0	50.0	50.0	47.0	44.0	41.0	35.0	32.0	28.0
			28.0	25.0	20.0	20.0	20.0	15.0	.0	.0	.0	.0	.0	.0
PW14	850.	8165.	.0	.0	.0	50.0	50.0	50.0	41.0	32.0	23.0	15.0	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
PW15	865.	8030.	.0	.0	.0	.0	50.0	50.0	48.0	46.0	44.0	40.0	38.0	34.0
			30.0	30.0	25.0	20.0	20.0	15.0	.0	.0	.0	.0	.0	.0
PW16	865.	7925.	.0	.0	.0	30.0	30.0	30.0	.0	.0	.0	30.0	30.0	20.0
			20.0	10.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
PW17	745.	7850.	.0	.0	.0	40.0	40.0	40.0	20.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
PW18	665.	7750.	.0	.0	.0	100.0	100.0	100.0	50.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
PW19	535.	7750.	.0	.0	.0	50.0	50.0	50.0	25.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
PW20	315.	7750.	.0	.0	.0	.0	60.0	60.0	54.0	48.0	42.0	30.0	24.0	24.0

			20.0	18.0	12.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
PW21	275.	7880.	.0	.0	.0	70.0	70.0	70.0	64.0	58.0	52.0	40.0	34.0	30.0
			30.0	25.0	20.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
PW22	325.	8005.	.0	.0	.0	70.0	70.0	70.0	62.0	54.0	46.0	30.0	22.0	20.0
			20.0	15.0	10.0	10.0	10.0	10.0	.0	.0	.0	.0	.0	.0
PW23	360.	8120.	.0	.0	.0	30.0	30.0	30.0	25.0	20.0	15.0	5.0	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
PW24	280.	8225.	.0	.0	.0	.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	30.0
			30.0	25.0	20.0	20.0	20.0	10.0	.0	.0	.0	.0	.0	.0
PW25	340.	8310.	.0	.0	.0	.0	30.0	30.0	15.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
PW26	485.	8345.	.0	.0	.0	.0	40.0	40.0	33.0	26.0	19.0	5.0	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P101	970.	7330.	14.6	3.9	1.2	23.1	4.4	.0	38.1	12.5	4.3	4.6	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P102	960.	7300.	11.0	3.6	1.1	19.7	3.4	.2	33.2	10.7	2.5	2.5	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P103	970.	7260.	11.6	3.3	1.3	20.8	4.3	1.0	33.3	10.5	2.3	2.0	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P104	1010.	7240.	10.4	3.0	1.0	20.1	5.3	1.1	33.0	10.9	3.2	1.9	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P105	1050.	7220.	16.4	5.0	1.5	32.0	9.9	1.5	51.6	16.9	7.7	6.0	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P106	1050.	7260.	12.4	4.4	1.5	24.0	6.9	2.0	39.3	12.1	4.5	4.9	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P107	1010.	7300.	10.5	3.3	1.2	17.3	4.5	.6	29.1	9.4	3.1	2.3	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P108	980.	7285.	8.9	2.6	1.0	14.7	2.5	.4	22.7	7.7	1.9	2.0	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P109	1015.	7265.	9.0	2.3	.8	15.0	2.8	.9	24.8	8.5	1.9	2.1	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P110	930.	7280.	.0	6.5	1.3	.0	6.2	1.1	.0	17.7	5.5	6.0	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P111	930.	7230.	.0	8.9	3.0	.0	13.4	3.5	.0	26.6	9.4	10.0	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P112	980.	7220.	.0	6.8	2.5	.0	9.7	2.5	.0	18.2	6.0	6.6	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P113	1030.	7190.	.0	7.7	2.8	.0	14.1	5.7	.0	26.2	9.7	10.0	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P114	1080.	7180.	.0	11.0	4.0	.0	21.4	7.0	.0	40.1	16.5	17.2	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P115	1090.	7230.	.0	8.1	3.0	.0	15.3	5.2	.0	27.5	9.8	11.4	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P116	1080.	7270.	.0	7.2	2.7	.0	11.4	4.0	.0	22.2	9.6	7.5	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P117	1050.	7300.	.0	6.0	2.6	.0	6.0	2.3	.0	17.1	5.3	3.7	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P118	1020.	7330.	.0	6.3	2.5	.0	6.0	.9	.0	15.0	5.2	5.0	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P119	970.	7360.	.0	7.5	3.2	.0	6.0	.0	.0	18.0	5.5	6.1	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P120	930.	7370.	.0	10.6	3.0	.0	6.5	.0	.0	24.0	8.4	7.0	13.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P121	920.	7330.	.0	8.3	2.9	.0	6.1	.0	.0	19.8	6.7	8.3	21.3	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P122	870.	7350.	.0	.0	7.8	.0	.0	.0	.0	.0	17.4	12.2	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

P123	900.	7300.	.0	.0	4.0	.0	.0	.0	.0	.0	11.5	8.1	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P124	900.	7250.	.0	.0	4.8	.0	.0	2.5	.0	.0	14.9	10.1	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P125	900.	7200.	.0	.0	7.9	.0	.0	8.3	.0	.0	22.8	17.0	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P126	950.	7200.	.0	.0	4.0	.0	.0	5.8	.0	.0	13.9	11.9	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P127	1000.	7180.	.0	.0	4.0	.0	.0	6.4	.0	.0	15.8	12.3	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P128	1050.	7150.	.0	.0	6.9	.0	.0	12.5	.0	.0	22.1	17.7	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P129	1120.	7130.	.0	.0	10.6	.0	.0	21.2	.0	.0	39.2	36.0	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P130	1120.	7200.	.0	.0	6.6	.0	.0	9.8	.0	.0	21.5	17.9	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P131	1150.	7250.	.0	.0	8.1	.0	.0	14.0	.0	.0	28.6	26.1	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P132	1100.	7300.	.0	.0	5.0	.0	.0	6.1	.0	.0	17.6	13.0	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P133	1050.	7350.	.0	.0	5.0	.0	.0	2.3	.0	.0	14.4	10.7	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P134	1000.	7370.	.0	.0	4.8	.0	.0	.1	.0	.0	11.8	8.5	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P135	950.	7400.	.0	.0	5.8	.0	.0	.0	.0	.0	14.0	8.3	16.6	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P136	900.	7400.	.0	.0	8.0	.0	.0	.0	.0	.0	16.5	10.9	5.2	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P201	885.	7375.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	9.9	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P202	900.	7355.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	8.8	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P203	960.	7370.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	17.5	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P204	950.	7350.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	18.7	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P205	900.	7315.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	21.1	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P206	875.	7350.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	15.9	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P207	850.	7400.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	8.1	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P208	880.	7430.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	7.8	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P209	800.	7450.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	5.6	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P210	935.	7435.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	11.1	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P211	860.	7480.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	6.4	21.3
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P212	840.	7460.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	6.1	16.2
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P213	820.	7430.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	8.1	24.1
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P214	780.	7450.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	9.2	16.7
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P215	750.	7460.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	8.9	18.7

			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P216	725.	7500.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	9.7	6.5
			21.8	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P217	735.	7535.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	8.8	6.5
			8.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P218	750.	7565.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	7.5	5.5
			15.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P219	800.	7565.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	10.7	9.2
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P220	850.	7565.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	9.4	17.8
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P221	875.	7530.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	6.8	19.3
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P222	835.	7480.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	4.5	9.6
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P223	800.	7470.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	6.0	8.5
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P224	760.	7485.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	4.8	5.6
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P225	760.	7510.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	4.7	6.2
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P226	765.	7540.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	4.4	8.3
			19.3	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P227	815.	7545.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	3.9	6.1
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P228	840.	7530.	.0	.0	.0	.0	.0	.0	.0	.0	.0	9.0	4.6	7.2
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P229	860.	7520.	.0	.0	.0	.0	.0	.0	.0	.0	.0	9.3	5.3	10.3
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P230	795.	7495.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	2.8	5.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P231	790.	7525.	.0	.0	.0	.0	.0	.0	.0	.0	.0	11.5	4.5	6.3
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P232	820.	7520.	.0	.0	.0	.0	.0	.0	.0	.0	.0	9.0	3.0	6.3
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P301	730.	7585.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	2.8
			12.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P302	700.	7600.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	8.3
			6.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P303	680.	7625.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	7.0
			5.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P304	675.	7650.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	11.8
			8.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P305	625.	7645.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	13.9
			1.7	7.6	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P306	635.	7620.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	8.5
			2.1	8.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P307	645.	7590.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	8.3
			2.1	13.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P308	660.	7565.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	9.2
			5.9	22.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P309	670.	7525.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	11.0
			10.6	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P310	670.	7500.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	14.7
			15.8	.0	6.1	.0	.0	.0	.0	.0	.0	.0	.0	.0
P311	700.	7480.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	13.9
			22.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

P312	700.	7530.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	4.3
			10.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P313	700.	7560.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	4.1
			9.8	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P314	670.	7600.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	5.0
			2.3	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P315	615.	7555.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			8.0	16.8	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P316	585.	7545.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			14.0	20.3	12.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
P317	550.	7580.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			10.4	14.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P318	525.	7610.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			8.6	11.6	10.9	.0	.0	.0	.0	.0	.0	.0	.0	.0
P319	500.	7630.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			10.7	14.2	13.5	15.0	30.1	30.6	.0	.0	.0	.0	.0	.0
P320	485.	7675.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			10.8	12.6	9.5	11.9	15.5	15.0	.0	.0	.0	.0	.0	.0
P321	510.	7695.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			8.3	11.1	6.0	7.4	10.7	11.1	.0	.0	.0	.0	.0	.0
P322	515.	7735.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			5.0	8.5	4.5	7.0	3.4	3.4	.0	.0	.0	.0	.0	.0
P323	550.	7750.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			3.3	5.8	4.5	7.3	11.8	11.0	.0	.0	.0	.0	.0	.0
P324	575.	7735.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			1.8	7.5	5.2	.0	.0	.0	.0	.0	.0	.0	.0	.0
P325	600.	7700.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			1.8	7.0	8.3	.0	.0	.0	.0	.0	.0	.0	.0	.0
P326	630.	7695.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			3.6	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P327	660.	7680.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			4.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P328	600.	7590.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			4.0	7.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P329	565.	7615.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			4.0	4.7	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P330	550.	7635.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			3.2	4.3	4.0	11.0	25.5	25.5	.0	.0	.0	.0	.0	.0
P331	520.	7560.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			15.1	22.1	16.5	18.6	39.1	42.3	.0	.0	.0	.0	.0	.0
P332	530.	7680.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			4.1	4.3	4.0	7.0	12.1	12.5	.0	.0	.0	.0	.0	.0
P333	560.	7715.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			2.4	5.8	4.2	6.0	10.4	10.4	.0	.0	.0	.0	.0	.0
P334	575.	7790.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			2.2	10.0	7.6	.0	.0	.0	.0	.0	.0	.0	.0	.0
P335	610.	7635.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			2.1	6.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P336	625.	7605.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			2.1	6.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P337	600.	7620.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			2.0	4.2	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P338	575.	7640.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			2.0	2.0	3.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P339	560.	7675.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			2.2	4.2	2.2	5.8	14.1	14.0	.0	.0	.0	.0	.0	.0
P340	600.	7650.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

			1.9	4.1	10.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P401	750.	7295.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	30.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P402	700.	7305.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	12.8	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P403	650.	7325.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	12.3	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P404	620.	7365.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	9.5	22.1	26.0	.0	.0	.0	.0	.0	.0	.0	.0
P405	585.	7365.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	5.0	19.3	22.0	.0	.0	.0	.0	.0	.0	.0	.0
P406	560.	7395.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	4.5	18.5	8.0	.0	.0	.0	.0	.0	.0	.0	.0
P407	585.	7415.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	8.8	12.5	.0	.0	.0	.0	.0	.0	.0	.0
P408	600.	7435.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	11.3	10.0	.0	.0	.0	.0	.0	.0	.0	.0
P409	600.	7460.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	8.2	.0	.0	.0	.0	.0	.0	.0	.0	.0
P410	620.	7465.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	3.7	.0	.0	.0	.0	.0	.0	.0	.0	.0
P411	645.	7460.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	14.2	.0	.0	.0	.0	.0	.0	.0	.0	.0
P412	665.	7435.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P413	690.	7430.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P414	700.	7380.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	4.8	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P415	715.	7350.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	8.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P416	735.	7330.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	13.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P417	660.	7365.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	2.0	21.8	22.0	.0	.0	.0	.0	.0	.0	.0	.0
P418	615.	7380.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	1.5	10.0	5.0	.0	.0	.0	.0	.0	.0	.0	.0
P419	590.	7395.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	5.0	3.0	.0	.0	.0	.0	.0	.0	.0	.0
P420	610.	7405.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	5.0	3.0	.0	.0	.0	.0	.0	.0	.0	.0
P421	625.	7435.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	4.4	9.0	.0	.0	.0	.0	.0	.0	.0	.0
P422	655.	7420.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	15.3	18.0	.0	.0	.0	.0	.0	.0	.0	.0
P423	655.	7395.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	18.0	21.0	.0	.0	.0	.0	.0	.0	.0	.0
P424	675.	7375.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P425	635.	7400.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	5.0	3.0	.0	.0	.0	.0	.0	.0	.0	.0
P426	715.	7320.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	9.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P427	690.	7340.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	5.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P428	665.	7350.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	5.3	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

P429	590.	7490.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	9.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
P430	605.	7510.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	6.2	.0	.0	.0	.0	.0	.0	.0	.0	.0
P431	630.	7520.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	8.2	.0	.0	.0	.0	.0	.0	.0	.0	.0
P432	650.	7490.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	6.1	.0	.0	.0	.0	.0	.0	.0	.0	.0
P433	625.	7500.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	4.8	.0	.0	.0	.0	.0	.0	.0	.0	.0
P434	525.	7385.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	10.0	.0	.0	.0	.0	.0	.0	.0	.0
P435	500.	7400.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	11.1	.0	.0	.0	.0	.0	.0	.0	.0
P436	475.	7405.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	14.1	.0	.0	.0	.0	.0	.0	.0	.0
P437	450.	7430.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	17.3	.0	.0	.0	.0	.0	.0	.0	.0
P438	460.	7460.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	15.9	.0	.0	.0	.0	.0	.0	.0	.0
P439	475.	7470.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	10.8	.0	.0	.0	.0	.0	.0	.0	.0
P440	500.	7460.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	8.0	.0	.0	.0	.0	.0	.0	.0	.0
P441	530.	7445.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	11.0	.0	.0	.0	.0	.0	.0	.0	.0
P442	550.	7435.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	8.0	.0	.0	.0	.0	.0	.0	.0	.0
P443	520.	7405.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
P444	490.	7420.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
P445	475.	7445.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
P446	510.	7440.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
P447	530.	7425.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
P500	510.	7750.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	3.3	5.6	3.5	2.9	.0	.0	.0	.0	.0	.0
P501	450.	7765.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	10.0	8.0	2.8	2.8	.0	.0	.0	.0	.0	.0
P502	425.	7775.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	13.5	15.0	3.4	2.7	.0	.0	.0	.0	.0	.0
P503	410.	7800.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	12.0	17.8	17.8	17.6	.0	.0	.0	.0	.0	.0
P504	435.	7810.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	10.5	14.5	14.4	14.0	.0	.0	.0	.0	.0	.0
P505	465.	7825.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	10.2	16.1	15.8	16.0	.0	.0	.0	.0	.0	.0
P506	480.	7830.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	3.7	9.5	10.0	9.6	.0	.0	.0	.0	.0	.0
P507	510.	7830.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	3.7	9.0	11.1	10.5	.0	.0	.0	.0	.0	.0
P508	535.	7830.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	4.4	8.3	9.5	9.1	.0	.0	.0	.0	.0	.0
P509	565.	7840.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

			.0	.0	6.9	11.2	12.1	12.1	.0	.0	.0	.0	.0	.0
P510	585.	7840.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	6.8	10.9	14.1	14.1	.0	.0	.0	.0	.0	.0
P511	585.	7820.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	4.7	6.0	10.7	9.2	.0	.0	.0	.0	.0	.0
P512	575.	7800.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	4.5	5.0	6.5	6.5	.0	.0	.0	.0	.0	.0
P513	565.	7790.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	2.0	5.0	5.1	5.1	.0	.0	.0	.0	.0	.0
P514	545.	7770.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	2.5	4.0	5.5	.0	.0	.0	.0	.0	.0	.0
P515	515.	7770.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	1.5	2.0	3.5	2.9	.0	.0	.0	.0	.0	.0
P516	480.	7770.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	3.0	3.0	2.9	2.6	.0	.0	.0	.0	.0	.0
P517	445.	7790.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	4.9	7.0	2.0	2.0	.0	.0	.0	.0	.0	.0
P518	475.	7805.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	3.0	5.0	.0	.0	.0	.0	.0	.0	.0	.0
P519	515.	7805.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	3.0	6.0	3.1	3.0	.0	.0	.0	.0	.0	.0
P520	545.	7815.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	3.0	5.0	3.4	3.4	.0	.0	.0	.0	.0	.0
P521	530.	7790.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	2.7	5.0	3.5	2.9	.0	.0	.0	.0	.0	.0
P522	500.	7785.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	4.5	6.0	2.0	2.0	.0	.0	.0	.0	.0	.0
P523	470.	7765.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	3.7	4.5	2.0	2.0	.0	.0	.0	.0	.0	.0
P524	450.	7680.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	12.3	12.8	.0	.0	.0	.0	.0	.0
P525	420.	7695.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	13.1	13.9	.0	.0	.0	.0	.0	.0
P526	395.	7710.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	13.1	13.1	.0	.0	.0	.0	.0	.0
P527	370.	7725.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	14.5	14.5	.0	.0	.0	.0	.0	.0
P528	355.	7745.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	14.5	14.5	.0	.0	.0	.0	.0	.0
P529	345.	7775.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	18.8	19.2	.0	.0	.0	.0	.0	.0
P530	350.	7795.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	18.8	18.8	.0	.0	.0	.0	.0	.0
P531	370.	7810.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	15.4	15.4	.0	.0	.0	.0	.0	.0
P532	455.	7695.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	4.5	4.5	.0	.0	.0	.0	.0	.0
P533	430.	7710.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	4.5	4.5	.0	.0	.0	.0	.0	.0
P534	410.	7730.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	4.0	4.0	.0	.0	.0	.0	.0	.0
P535	390.	7740.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	5.8	6.0	.0	.0	.0	.0	.0	.0
P536	375.	7755.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	5.7	5.6	.0	.0	.0	.0	.0	.0
P537	370.	7785.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	4.5	4.5	.0	.0	.0	.0	.0	.0

P538	400.	7775.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	3.1	3.4	.0	.0	.0	.0	.0	.0
P539	415.	7765.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	3.2	3.4	.0	.0	.0	.0	.0	.0
P540	445.	7745.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	3.3	3.2	.0	.0	.0	.0	.0	.0
P541	470.	7725.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	3.4	3.4	.0	.0	.0	.0	.0	.0
P542	475.	7860.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	.0	2.8	.0	.0	.0	.0	.0	.0
P543	490.	7885.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	.0	2.9	.0	.0	.0	.0	.0	.0
P544	515.	7900.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	.0	3.1	.0	.0	.0	.0	.0	.0
P545	535.	7900.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	.0	5.4	.0	.0	.0	.0	.0	.0
P546	565.	7900.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	.0	3.3	.0	.0	.0	.0	.0	.0
P547	580.	7880.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	.0	3.5	.0	.0	.0	.0	.0	.0
P548	580.	7860.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	.0	3.4	.0	.0	.0	.0	.0	.0
P549	500.	7855.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	.0	2.6	.0	.0	.0	.0	.0	.0
P550	510.	7875.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	.0	2.6	.0	.0	.0	.0	.0	.0
P551	545.	7875.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	.0	2.6	.0	.0	.0	.0	.0	.0
P552	550.	7860.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	.0	2.6	.0	.0	.0	.0	.0	.0
P553	530.	7860.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
			.0	.0	.0	.0	.0	2.6	.0	.0	.0	.0	.0	.0

= = RESULTS = =

COMPUTED WATER LEVEL DRAWDOWNS IN OBSERVATION WELLS (FT)

WELL NO	COORDINATES X	COORDINATES Y	ELAPSED TIME (DAYS)---											
			182.00	365.00	547.00	730.00	912.00	1095.00	1277.00	1460.00	1642.00	1825.00	2190.00	2555.00
			2920.00	3286.00	3651.00	4016.00	4381.00	4746.00	5111.00	5476.00	5841.00	6207.00	6572.00	6937.00
SH01	675.	8075.	1.23	6.24	8.51	39.45	64.42	76.55	84.57	91.20	103.57	112.05	125.15	124.12
			126.63	127.04	120.25	115.54	118.51	114.27	50.63	39.16	32.71	28.34	25.13	22.64
SH02	675.	7925.	1.78	7.08	9.50	44.96	68.20	80.01	86.44	91.40	104.70	114.44	128.86	129.39
			132.08	133.07	120.03	116.19	119.15	119.66	51.03	39.36	32.84	28.43	25.20	22.69
SH03	525.	7925.	1.44	6.57	8.91	44.26	68.25	80.31	87.66	92.95	105.73	113.64	127.55	128.03
			132.46	134.28	124.12	121.63	127.17	129.56	51.16	39.41	32.86	28.45	25.21	22.70
SH04	525.	8075.	1.02	5.91	8.11	39.37	65.06	77.37	85.61	91.97	103.98	111.05	124.00	123.05
			126.54	127.30	121.60	117.30	121.59	117.78	50.76	39.20	32.73	28.35	25.14	22.64
OW11	410.	7695.	1.79	4.48	6.38	47.56	68.76	78.62	81.36	81.46	86.25	89.13	97.08	101.46
			108.96	112.39	112.57	112.30	124.61	125.79	51.08	39.36	32.83	28.43	25.19	22.69
OW12	615.	8315.	.60	2.70	4.21	26.81	65.98	76.64	77.19	75.92	73.86	73.11	77.11	79.08
			81.86	83.02	81.51	81.12	83.95	83.21	49.47	38.57	32.33	28.07	24.92	22.47
OW13	725.	8265.	.77	3.07	4.67	47.03	70.38	80.99	83.10	83.63	85.98	86.56	91.44	91.94
			94.31	94.27	90.54	89.97	92.42	89.80	49.59	38.65	32.38	28.11	24.95	22.50
OW14	850.	8165.	1.10	3.59	5.31	48.66	70.34	80.68	80.58	79.36	80.43	81.69	82.57	84.56
			86.13	87.02	84.72	84.04	85.84	85.04	49.72	38.73	32.44	28.15	24.99	22.53
OW15	865.	8030.	1.60	4.46	6.35	34.34	73.64	83.83	85.30	86.47	91.04	95.74	102.23	102.94
			102.46	103.07	98.44	95.97	97.29	94.93	50.18	38.96	32.59	28.26	25.07	22.59
OW16	865.	7925.	2.12	5.16	7.17	46.44	67.39	77.27	68.92	70.44	76.31	93.61	101.74	101.15
			101.38	98.52	92.31	91.82	92.48	92.17	50.43	39.08	32.67	28.32	25.12	22.63
OW17	745.	7850.	2.32	5.75	7.87	56.55	76.92	87.02	81.21	73.93	80.88	87.77	97.69	102.32
			103.73	105.07	102.54	102.36	103.62	103.99	50.95	39.33	32.82	28.43	25.20	22.69
OW18	665.	7750.	2.64	5.96	8.10	79.04	98.20	107.93	91.56	72.51	79.03	84.86	95.37	103.64
			107.03	109.92	109.12	109.73	111.14	111.93	51.13	39.41	32.87	28.46	25.22	22.71
OW19	535.	7750.	2.11	5.23	7.27	60.72	81.17	91.24	83.78	73.68	79.69	84.14	93.62	100.67
			108.82	114.88	117.95	121.47	127.80	128.58	51.25	39.45	32.89	28.47	25.23	22.72
OW20	315.	7750.	1.33	3.74	5.50	35.33	78.13	88.19	89.10	87.59	89.56	87.17	91.98	96.68
			100.96	104.00	105.21	102.86	114.75	115.75	50.91	39.27	32.77	28.38	25.16	22.66
OW21	275.	7880.	.98	3.26	4.92	60.68	82.97	93.40	94.11	92.55	94.04	90.76	94.95	97.11
			101.89	102.70	102.89	96.43	104.47	105.23	50.75	39.19	32.71	28.34	25.12	22.63
OW22	325.	8005.	.85	3.26	4.91	61.79	84.95	95.74	95.70	93.48	94.50	89.84	93.46	95.42
			99.72	99.82	98.44	98.46	104.52	104.86	50.68	39.15	32.69	28.32	25.11	22.62
OW23	360.	8120.	.70	3.03	4.63	43.95	69.03	79.94	81.02	79.97	81.99	79.62	84.23	86.23
			90.05	91.47	90.77	90.62	95.34	94.96	50.37	39.00	32.59	28.25	25.06	22.58
OW24	280.	8225.	.47	2.25	3.64	25.40	64.33	74.87	77.58	78.11	81.09	82.12	87.74	86.30
			89.94	89.64	87.65	87.84	91.84	87.83	49.62	38.62	32.35	28.07	24.92	22.47
OW25	340.	8310.	.42	2.12	3.47	22.76	59.01	69.50	66.95	62.26	65.04	66.14	71.64	73.63
			77.04	78.41	77.95	78.09	81.63	81.02	49.28	38.46	32.24	28.00	24.87	22.43
OW26	485.	8345.	.48	2.33	3.73	23.46	63.51	74.09	74.37	72.63	72.73	68.97	72.73	74.86
			77.97	79.32	78.45	78.34	81.48	80.97	49.28	38.47	32.26	28.01	24.88	22.44

= = RESULTS = =

COMPUTED WATER LEVEL DRAWDOWNS IN OBSERVATION WELLS (FT)

WELL NO	COORDINATES X	Y'	ELAPSED TIME (DAYS)--- 182.00	365.00	547.00	730.00	912.00	1095.00	1277.00	1460.00	1642.00	1825.00	2190.00	2555.00
			2920.00	3286.00	3651.00	4016.00	4381.00	4746.00	5111.00	5476.00	5841.00	6207.00	6572.00	6937.00
W101	970.	7330.	18.02	18.31	18.50	45.39	45.80	45.67	87.60	87.70	87.51	88.87	87.50	78.24
			71.97	76.48	76.95	78.71	71.67	71.80	48.54	38.20	32.12	27.93	24.83	22.40
W102	960.	7300.	18.07	18.49	18.56	45.42	45.50	45.55	87.85	87.76	87.17	88.29	84.62	76.62
			70.88	75.83	76.31	78.19	70.92	71.04	48.41	38.13	32.08	27.90	24.80	22.38
W103	970.	7260.	18.18	18.45	18.64	45.40	45.31	45.48	87.37	87.35	86.91	87.70	78.84	73.25
			68.45	73.52	74.11	76.10	69.12	69.22	48.10	37.98	31.98	27.83	24.75	22.34
W104	1010.	7240.	18.15	18.45	18.58	45.23	45.39	45.36	87.35	87.37	87.08	87.49	74.31	70.15
			66.00	70.64	71.39	73.33	67.16	67.24	47.74	37.80	31.87	27.75	24.69	22.29
W105	1050.	7220.	18.33	18.46	18.50	45.36	45.64	45.13	87.28	87.07	87.70	88.77	70.32	67.25
			63.69	67.98	68.85	70.76	65.29	65.35	47.36	37.61	31.75	27.67	24.63	22.24
W106	1050.	7260.	18.08	18.69	18.64	45.16	45.66	45.59	87.24	87.20	87.24	88.12	73.20	69.43
			65.36	69.52	70.29	72.11	66.55	66.62	47.63	37.75	31.83	27.73	24.67	22.28
W107	1010.	7300.	18.25	18.60	18.65	45.24	45.74	45.52	87.56	87.60	87.21	87.93	79.70	73.86
			68.74	73.06	73.67	75.45	69.19	69.29	48.13	38.00	31.99	27.84	24.76	22.35
W108	990.	7285.	18.46	18.58	18.64	45.63	45.37	45.49	87.59	87.69	87.09	88.16	80.09	73.97
			68.88	73.53	74.13	75.99	69.36	69.46	48.15	38.01	32.00	27.85	24.76	22.35
W109	1015.	7265.	18.44	18.49	18.59	45.27	45.21	45.49	87.47	87.62	86.96	87.82	76.17	71.43
			66.94	71.42	72.12	73.99	67.84	67.93	47.88	37.87	31.91	27.79	24.72	22.31
W110	930.	7280.	12.98	18.48	18.33	36.89	45.30	45.57	73.63	87.30	87.40	88.54	83.90	76.59
			71.06	76.65	77.05	79.08	71.17	71.30	48.44	38.14	32.08	27.91	24.81	22.38
W111	930.	7230.	11.91	18.40	18.58	34.15	45.63	45.56	69.20	86.88	87.37	88.25	77.22	72.77
			68.34	74.14	74.70	76.89	69.22	69.33	48.10	37.97	31.98	27.83	24.75	22.34
W112	980.	7220.	13.53	18.74	18.76	36.48	45.39	45.41	73.00	86.85	87.12	87.99	74.12	70.16
			66.13	71.20	71.94	74.00	67.37	67.46	47.77	37.81	31.87	27.76	24.69	22.30
W113	1030.	7190.	12.47	18.39	18.59	33.80	45.24	45.82	68.57	86.83	87.25	88.04	69.16	66.41
			63.10	67.64	68.57	70.58	64.90	64.97	47.26	37.56	31.71	27.64	24.61	22.23
W114	1080.	7180.	10.88	18.33	18.50	30.34	45.28	45.64	62.84	87.22	87.56	88.59	66.05	63.96
			61.07	65.17	66.19	68.11	63.19	63.24	46.87	37.37	31.59	27.56	24.54	22.18
W115	1090.	7230.	12.06	18.35	18.55	33.06	45.43	45.67	67.38	86.75	87.03	88.35	68.60	66.02
			62.67	66.59	67.49	69.31	64.39	64.44	47.17	37.52	31.69	27.63	24.60	22.22
W116	1080.	7270.	12.81	18.50	18.57	35.02	45.36	45.73	70.67	86.85	87.50	87.68	71.70	68.48
			64.59	68.45	69.25	71.00	65.89	65.95	47.50	37.69	31.80	27.70	24.65	22.26
W117	1050.	7300.	13.67	18.60	18.71	37.21	45.19	45.66	74.26	87.23	86.87	87.23	75.99	71.63
			67.03	70.98	71.67	73.38	67.81	67.89	47.89	37.88	31.92	27.79	24.72	22.32
W118	1020.	7330.	13.51	18.54	18.69	37.64	45.35	45.54	74.92	86.72	87.04	88.02	81.06	75.11
			69.64	73.63	74.21	75.89	69.84	69.94	48.25	38.06	32.03	27.87	24.78	22.36
W119	970.	7360.	12.25	18.40	18.73	36.68	45.82	45.90	73.14	87.05	87.21	88.82	90.94	80.43
			73.47	77.62	78.07	79.72	72.77	72.90	48.72	38.28	32.17	27.97	24.86	22.42
W120	930.	7370.	10.71	18.46	18.60	34.91	45.89	46.44	70.04	87.31	87.61	88.86	99.17	84.23
			76.09	80.53	80.90	82.57	74.73	74.89	48.99	38.41	32.25	28.03	24.90	22.46

= = RESULTS = =

COMPUTED WATER LEVEL DRAWDOWNS IN OBSERVATION WELLS (FT)

WELL	COORDINATES		ELAPSED TIME (DAYS)---											
NO	X	Y	182.00	365.00	547.00	730.00	912.00	1095.00	1277.00	1460.00	1642.00	1825.00	2190.00	2555.00
			2920.00	3286.00	3651.00	4016.00	4381.00	4746.00	5111.00	5476.00	5841.00	6207.00	6572.00	6937.00
W121	920.	7330.	11.73	18.47	18.58	35.86	45.66	45.86	71.77	87.14	87.52	89.40	98.43	81.33
			74.32	79.56	79.88	81.74	73.52	73.67	48.80	38.32	32.20	27.99	24.87	22.43
W122	870.	7360.	9.29	13.63	18.61	32.86	42.73	46.38	66.60	75.76	87.69	88.19	94.89	86.29
			77.98	83.87	84.01	85.90	76.25	76.45	49.15	38.49	32.30	28.06	24.92	22.48
W123	900.	7300.	11.18	15.47	18.54	34.53	42.88	45.36	69.67	79.48	87.88	88.21	88.71	79.69
			73.43	79.46	79.68	81.72	72.99	73.15	48.71	38.28	32.17	27.97	24.85	22.42
W124	900.	7250.	10.97	15.11	18.59	33.13	41.48	45.24	67.52	77.65	87.87	87.43	80.39	75.40
			70.48	76.83	77.17	79.40	70.92	71.05	48.38	38.11	32.06	27.89	24.80	22.37
W125	900.	7200.	9.98	13.95	18.74	30.45	38.90	45.44	63.20	73.34	87.25	86.50	74.56	71.54
			67.67	73.98	74.57	76.94	68.88	69.00	48.02	37.93	31.95	27.81	24.73	22.33
W126	950.	7200.	11.58	15.53	18.57	32.89	40.67	45.51	67.16	77.64	87.39	87.56	73.39	69.95
			66.14	71.64	72.38	74.57	67.50	67.60	47.78	37.82	31.88	27.76	24.69	22.30
W127	1000.	7180.	11.72	15.60	18.56	32.48	40.22	45.42	66.44	77.38	87.58	87.40	69.72	66.95
			63.62	68.49	69.39	71.49	65.41	65.48	47.36	37.61	31.74	27.67	24.62	22.24
W128	1050.	7150.	10.21	14.36	18.76	28.94	37.54	45.93	60.53	72.84	87.01	86.59	65.45	63.54
			60.81	65.19	66.25	68.28	63.08	63.13	46.84	37.35	31.58	27.55	24.54	22.17
W129	1120.	7130.	8.39	12.23	18.50	24.80	33.09	45.86	53.59	65.00	86.95	87.24	61.35	60.16
			57.96	61.81	62.99	64.92	60.65	60.69	46.23	37.04	31.38	27.41	24.43	22.09
W130	1120.	7200.	10.04	14.25	18.73	28.66	37.48	45.38	60.10	72.56	87.18	87.13	65.17	63.32
			60.50	64.27	65.28	67.10	62.63	62.68	46.75	37.31	31.55	27.53	24.52	22.16
W131	1150.	7250.	9.44	13.27	18.38	27.86	36.19	45.79	58.89	69.68	86.92	87.48	66.01	64.80
			61.19	64.64	65.58	67.27	63.10	63.15	46.88	37.38	31.60	27.56	24.55	22.18
W132	1100.	7300.	11.21	15.03	18.42	32.26	40.17	45.54	66.19	76.35	87.42	87.06	71.87	68.90
			64.93	68.50	69.27	70.92	66.10	66.16	47.55	37.71	31.81	27.72	24.66	22.27
W133	1050.	7350.	11.58	15.29	18.54	34.27	41.86	45.36	69.42	78.24	87.35	87.55	78.91	74.33
			69.08	72.68	73.27	74.85	69.37	69.45	48.18	38.02	32.01	27.86	24.77	22.36
W134	1000.	7370.	11.63	15.59	18.74	35.40	43.24	45.62	71.10	79.91	87.78	88.33	86.14	78.88
			72.41	76.18	76.66	78.23	71.94	72.05	48.60	38.23	32.14	27.95	24.84	22.41
W135	950.	7400.	9.93	14.45	18.44	33.97	43.57	46.68	68.42	77.94	87.72	88.09	98.32	85.05
			76.59	80.31	80.71	82.22	75.06	75.21	49.04	38.44	32.27	28.04	24.91	22.47
W136	900.	7400.	9.00	13.46	18.55	33.23	43.60	47.39	66.94	76.03	87.55	88.52	97.83	89.69
			79.56	83.69	84.07	85.63	77.21	77.40	49.29	38.56	32.35	28.09	24.95	22.50
W201	885.	7375.	9.25	13.73	16.65	33.23	43.34	46.93	67.07	76.39	83.47	85.62	98.79	88.18
			78.85	83.81	84.11	85.83	76.77	76.96	49.23	38.53	32.33	28.08	24.94	22.49
W202	900.	7355.	10.20	14.95	17.29	34.12	43.62	46.38	68.73	78.96	84.70	86.45	98.16	84.97
			76.79	81.95	82.23	84.02	75.31	75.49	49.05	38.44	32.27	28.04	24.91	22.46
W203	960.	7370.	11.48	16.17	17.78	35.73	44.27	46.12	71.51	81.80	85.60	87.15	97.34	81.92
			74.49	78.61	79.03	80.65	73.53	73.67	48.83	38.34	32.21	27.99	24.87	22.44
W204	950.	7350.	12.37	16.75	17.99	36.94	44.55	45.98	73.56	83.20	86.08	87.56	97.57	81.09
			73.97	78.48	78.89	80.61	73.17	73.31	48.77	38.31	32.19	27.98	24.86	22.43

= = RESULTS = =

COMPUTED WATER LEVEL DRAWDOWNS IN OBSERVATION WELLS (FT)

WELL NO	COORDINATES X	Y	ELAPSED TIME (DAYS)--- 182.00 / 2920.00	365.00 / 3286.00	547.00 / 3651.00	730.00 / 4016.00	912.00 / 4381.00	1095.00 / 4746.00	1277.00 / 5111.00	1460.00 / 5476.00	1642.00 / 5841.00	1825.00 / 6207.00	2190.00 / 6572.00	2555.00 / 6937.00
W205	900.	7315.	11.02	15.49	17.57	34.59	43.19	45.61	69.71	79.74	85.16	86.48	96.57	81.07
			74.33	80.18	80.40	82.38	73.62	73.78	48.81	38.32	32.20	27.99	24.87	22.43
W206	875.	7350.	9.45	13.85	17.22	33.07	42.86	46.37	66.95	76.28	84.80	86.07	98.41	86.00
			77.73	83.50	83.67	85.55	76.06	76.25	49.13	38.48	32.29	28.06	24.92	22.47
W207	850.	7400.	7.91	11.98	14.86	32.19	43.19	47.96	64.99	72.82	79.97	83.41	97.82	94.22
			82.63	87.32	87.78	89.39	79.38	79.62	49.51	38.66	32.41	28.14	24.98	22.52
W208	880.	7430.	7.90	12.00	14.89	32.55	43.70	48.50	65.46	73.19	80.32	84.11	98.30	95.29
			82.74	86.15	86.64	88.04	79.40	79.61	49.54	38.68	32.42	28.14	24.99	22.53
W209	900.	7450.	7.75	11.78	14.53	32.50	43.76	48.71	65.30	72.79	79.65	83.78	97.40	94.87
			82.53	85.37	85.81	87.10	79.29	79.50	49.54	38.68	32.42	28.15	24.99	22.53
W210	935.	7435.	8.57	12.74	15.45	32.79	43.33	47.62	66.16	74.42	81.13	84.23	97.12	89.27
			79.31	82.46	82.85	84.21	77.04	77.21	49.29	38.56	32.35	28.10	24.95	22.50
W211	860.	7480.	6.66	10.45	13.05	32.41	44.67	50.56	64.46	70.70	77.33	83.40	99.14	109.56
			87.51	89.22	89.79	90.89	82.61	82.86	49.85	38.83	32.51	28.21	25.04	22.57
W212	840.	7460.	6.74	10.54	13.19	32.28	44.42	50.22	64.36	70.73	77.44	83.00	99.37	108.43
			87.86	90.09	90.85	92.04	82.72	83.00	49.85	38.82	32.51	28.21	25.04	22.56
W213	820.	7430.	6.88	10.70	13.38	31.87	43.73	49.38	63.97	70.62	77.40	82.12	98.40	107.87
			87.04	90.62	91.51	92.91	82.22	82.50	49.78	38.79	32.49	28.19	25.02	22.56
W214	780.	7450.	6.02	9.63	12.16	31.77	44.40	50.76	63.27	68.92	75.43	80.89	98.50	109.40
			92.08	94.27	95.99	97.15	85.26	85.60	50.02	38.90	32.56	28.24	25.06	22.58
W215	750.	7460.	5.51	9.01	11.46	31.77	44.87	51.64	62.94	67.97	74.34	79.88	97.64	109.61
			95.88	96.78	99.44	100.36	87.39	87.78	50.16	38.96	32.60	28.27	25.08	22.60
W216	725.	7500.	4.86	8.24	10.61	32.83	46.84	54.20	63.65	67.61	73.83	79.76	97.60	109.38
			109.68	100.35	103.06	103.23	91.38	91.84	50.40	39.08	32.67	28.32	25.12	22.63
W217	735.	7535.	4.65	8.03	10.37	34.01	48.54	56.15	64.72	68.09	74.29	80.73	98.60	110.76
			108.43	101.23	102.31	102.46	93.03	93.49	50.51	39.13	32.70	28.34	25.13	22.64
W218	750.	7565.	4.50	7.88	10.21	34.98	49.89	57.67	65.66	68.47	74.69	81.41	98.47	110.20
			109.84	100.99	101.10	101.34	93.78	94.23	50.57	39.16	32.72	28.35	25.14	22.65
W219	800.	7565.	4.90	8.36	10.73	34.25	48.65	56.10	65.13	68.76	75.05	82.58	100.22	110.33
			98.71	96.49	96.64	97.14	90.22	90.58	50.40	39.09	32.67	28.32	25.12	22.63
W220	850.	7565.	5.28	8.78	11.18	33.35	47.21	54.34	64.51	68.85	75.16	82.60	98.54	109.86
			92.66	92.37	92.44	93.11	86.88	87.17	50.21	39.00	32.62	28.29	25.09	22.61
W221	875.	7530.	5.98	9.60	12.06	32.55	45.52	52.03	64.15	69.51	75.92	83.20	97.74	108.80
			88.79	89.53	89.80	90.67	83.91	84.16	49.98	38.89	32.55	28.24	25.06	22.58
W222	835.	7480.	6.36	10.08	12.66	32.44	44.97	51.11	64.28	70.15	76.75	83.22	99.31	109.08
			89.78	91.10	91.88	92.93	83.95	84.23	49.96	38.87	32.54	28.23	25.05	22.58
W223	800.	7470.	6.06	9.70	12.24	32.25	45.00	51.37	63.84	69.40	75.93	82.09	98.98	109.22
			92.31	93.44	94.71	95.74	85.32	85.65	50.04	38.91	32.57	28.25	25.06	22.59
W224	760.	7485.	5.39	8.89	11.33	32.46	45.87	52.79	63.60	68.31	74.66	80.90	98.12	109.38
			98.16	97.02	99.04	99.73	88.38	88.77	50.24	39.00	32.62	28.29	25.09	22.61

= = RESULTS = =

COMPUTED WATER LEVEL DRAWDOWNS IN OBSERVATION WELLS (FT)

WELL NO	COORDINATES X	Y	ELAPSED TIME (DAYS)---											
			182.00	365.00	547.00	730.00	912.00	1095.00	1277.00	1460.00	1642.00	1825.00	2190.00	2555.00
			2920.00	3286.00	3651.00	4016.00	4381.00	4746.00	5111.00	5476.00	5841.00	6207.00	6572.00	6937.00
W225	760.	7510.	5.13	8.60	11.01	33.13	46.97	54.14	64.14	68.35	74.66	81.48	98.67	110.35
			101.14	98.01	99.53	100.02	89.87	90.28	50.34	39.05	32.65	28.31	25.11	22.62
W226	765.	7540.	4.88	8.31	10.69	33.98	48.30	55.73	64.83	68.49	74.76	81.98	98.79	110.69
			108.25	98.74	99.47	99.86	91.29	91.71	50.44	39.10	32.68	28.33	25.13	22.64
W227	815.	7545.	5.27	8.78	11.19	33.56	47.45	54.57	64.70	68.95	75.30	83.47	99.04	109.95
			96.05	94.66	96.04	95.68	88.26	88.59	50.28	39.03	32.64	28.30	25.10	22.62
W228	840.	7530.	5.68	9.26	11.72	33.00	46.35	53.11	64.41	69.32	75.72	86.43	99.00	109.31
			92.36	92.23	92.64	93.43	86.00	86.29	50.13	38.96	32.60	28.27	25.08	22.60
W229	860.	7520.	6.01	9.65	12.14	32.66	45.62	52.10	64.29	69.67	76.12	86.24	98.57	108.50
			89.78	90.40	90.78	91.67	84.37	84.63	50.01	38.90	32.56	28.24	25.06	22.59
W230	795.	7495.	5.69	9.26	11.74	32.70	45.92	52.63	64.08	69.07	75.51	82.66	98.84	109.75
			95.16	94.68	95.85	96.66	86.94	87.29	50.17	38.97	32.60	28.27	25.08	22.60
W231	790.	7525.	5.28	8.78	11.21	33.37	47.17	54.26	64.50	68.82	75.17	86.12	99.42	110.83
			98.43	96.10	96.93	97.54	88.84	89.21	50.30	39.04	32.64	28.30	25.11	22.62
W232	820.	7520.	5.63	8.21	11.67	33.04	46.43	53.22	64.41	69.25	75.66	86.35	99.09	109.78
			94.10	93.51	94.15	94.92	86.74	87.06	50.17	38.98	32.61	28.28	25.09	22.61
W301	730.	7585.	4.16	7.50	9.79	36.06	51.53	59.63	66.37	68.53	74.71	81.06	95.01	108.96
			110.58	103.63	103.01	103.14	96.49	97.00	50.68	39.21	32.75	28.38	25.16	22.66
W302	700.	7600.	3.82	7.10	9.35	37.22	53.25	61.65	67.24	68.63	74.75	80.72	93.52	109.55
			110.30	107.38	105.65	105.68	99.95	100.53	50.80	39.26	32.78	28.40	25.18	22.68
W303	680.	7625.	3.51	6.76	8.97	38.98	55.66	64.37	68.65	69.07	75.18	80.95	92.91	109.69
			110.39	109.92	107.37	107.45	103.46	104.10	50.91	39.31	32.81	28.42	25.19	22.69
W304	675.	7650.	3.31	6.55	8.75	40.85	58.05	66.98	70.11	69.64	75.79	81.53	93.05	110.10
			110.92	110.25	107.89	108.06	105.53	106.20	50.97	39.34	32.83	28.43	25.20	22.69
W305	625.	7645.	3.05	6.21	8.37	40.65	58.23	67.33	70.17	69.57	75.57	80.83	91.71	109.18
			110.31	117.43	112.03	112.07	110.95	111.74	51.04	39.37	32.85	28.44	25.21	22.70
W306	635.	7620.	3.25	6.42	8.60	38.86	55.87	64.75	68.64	68.86	74.84	80.17	91.39	108.86
			110.38	117.37	110.89	110.96	107.81	108.56	50.97	39.34	32.83	28.43	25.20	22.69
W307	645.	7590.	3.50	6.69	8.89	36.95	53.31	61.91	66.99	68.12	74.09	79.46	91.13	108.75
			109.99	117.61	110.07	109.95	104.27	104.98	50.87	39.29	32.80	28.41	25.18	22.68
W308	660.	7565.	3.78	6.99	9.22	35.56	51.32	59.65	65.79	67.66	73.66	79.12	91.37	109.30
			110.44	117.42	109.16	108.75	100.83	101.48	50.77	39.25	32.77	28.39	25.17	22.67
W309	670.	7525.	4.13	7.37	9.63	33.66	48.61	56.56	64.10	66.97	72.98	78.40	91.16	109.43
			110.09	106.53	109.08	108.12	96.77	97.36	50.62	39.18	32.73	28.36	25.15	22.65
W310	670.	7500.	4.30	7.54	9.82	32.61	47.11	54.87	63.11	66.48	72.51	77.77	90.37	108.56
			109.13	104.27	111.16	108.42	94.72	95.28	50.52	39.13	32.70	28.34	25.13	22.64
W311	700.	7480.	4.75	8.08	10.42	32.05	45.95	53.32	62.76	66.82	72.96	78.34	91.98	108.55
			108.40	101.02	105.77	105.74	91.43	91.92	50.37	39.06	32.66	28.31	25.11	22.62
W312	700.	7530.	4.37	7.67	9.98	33.92	48.69	56.49	64.46	67.52	73.64	79.45	93.54	109.15
			110.29	104.23	105.87	105.53	95.09	95.62	50.57	39.16	32.72	28.35	25.14	22.65

= = RESULTS = =

COMPUTED WATER LEVEL DRAWDOWNS IN OBSERVATION WELLS (FT)

WELL NO	COORDINATES X	Y	ELAPSED TIME (DAYS)--- 182.00 / 2920.00	365.00 / 3286.00	547.00 / 3651.00	730.00 / 4016.00	912.00 / 4381.00	1095.00 / 4746.00	1277.00 / 5111.00	1460.00 / 5476.00	1642.00 / 5841.00	1825.00 / 6207.00	2190.00 / 6572.00	2555.00 / 6937.00
W313	700.	7560.	4.13	7.42	9.71	35.22	50.52	58.58	65.58	67.97	74.08	80.02	93.67	109.48
			111.26	106.09	105.71	105.54	97.24	97.79	50.68	39.21	32.75	28.37	25.16	22.66
W314	670.	7600.	3.61	6.84	9.06	37.49	53.81	62.36	67.45	68.50	74.55	80.20	92.33	109.27
			110.04	111.27	108.14	108.09	102.69	103.34	50.86	39.29	32.80	28.41	25.18	22.68
W315	615.	7555.	3.49	6.60	8.78	34.82	50.78	59.26	65.09	66.90	72.73	77.72	88.81	102.19
			109.72	117.91	112.39	111.95	103.66	104.42	50.80	39.26	32.78	28.39	25.17	22.67
W316	585.	7545.	3.31	6.35	8.50	33.96	49.97	58.52	64.29	66.20	71.91	76.61	87.02	98.78
			109.57	118.13	116.64	113.70	104.98	105.82	50.79	39.25	32.77	28.39	25.17	22.67
W317	550.	7580.	2.91	5.88	7.97	35.40	52.36	61.29	65.89	66.99	72.58	77.05	86.88	97.46
			109.81	118.53	113.63	115.64	112.60	113.63	50.92	39.31	32.81	28.41	25.19	22.68
W318	525.	7610.	2.63	5.56	7.61	36.75	54.54	63.73	67.49	68.00	73.50	77.77	87.23	96.79
			109.58	118.06	117.40	116.92	118.30	119.37	51.01	39.35	32.83	28.43	25.20	22.69
W319	500.	7630.	2.42	5.30	7.32	37.45	55.89	65.28	68.57	68.79	74.18	78.22	87.33	95.92
			109.31	117.53	117.88	121.35	129.51	130.72	51.05	39.36	32.84	28.43	25.20	22.69
W320	485.	7675.	2.18	5.06	7.06	39.98	59.58	69.26	71.57	71.02	76.39	80.23	89.15	96.73
			109.81	116.85	117.47	121.49	130.15	131.08	51.14	39.40	32.86	28.45	25.21	22.70
W321	510.	7695.	2.22	5.19	7.21	42.16	61.88	71.65	73.09	71.70	77.30	81.41	90.63	98.46
			110.77	118.21	118.15	121.88	130.01	131.14	51.18	39.42	32.87	28.46	25.22	22.71
W322	515.	7735.	2.09	5.13	7.15	45.71	66.13	76.13	76.03	73.24	79.03	83.21	92.47	99.55
			109.91	116.73	118.76	123.11	129.04	129.98	51.23	39.45	32.89	28.47	25.23	22.71
W323	560.	7750.	2.17	5.33	7.38	48.53	68.82	78.86	77.54	73.58	79.69	84.32	93.97	101.25
			109.88	116.62	118.74	122.44	129.51	130.05	51.24	39.46	32.90	28.47	25.23	22.72
W324	575.	7735.	2.34	5.52	7.60	46.68	66.43	76.32	75.95	72.83	79.00	83.89	93.81	101.94
			109.71	117.30	117.66	118.10	122.86	123.72	51.22	39.45	32.89	28.47	25.23	22.72
W325	600.	7700.	2.62	5.79	7.90	44.77	63.63	73.21	73.81	71.41	77.52	82.61	92.88	102.85
			109.90	116.94	116.65	115.10	117.81	118.67	51.16	39.42	32.88	28.46	25.23	22.71
W326	630.	7695.	2.79	6.01	8.14	45.10	63.57	73.02	73.59	71.09	77.27	82.65	93.25	104.08
			110.12	113.32	112.02	112.36	113.42	114.22	51.12	39.41	32.87	28.46	25.22	22.71
W327	660.	7680.	3.03	6.27	8.44	43.75	61.65	70.87	72.31	70.47	76.67	82.31	93.32	105.35
			109.81	111.20	109.32	109.60	108.91	109.63	51.06	39.38	32.85	28.45	25.21	22.70
W328	600.	7590.	3.19	6.28	8.43	36.69	53.44	62.25	66.87	67.79	73.60	78.53	89.25	102.27
			110.04	117.91	112.72	113.10	108.76	109.60	50.93	39.32	32.81	28.42	25.19	22.68
W329	565.	7615.	2.85	5.87	7.97	37.82	55.37	64.48	68.14	68.42	74.12	78.76	88.83	99.95
			110.13	117.78	114.40	115.84	115.84	116.78	51.02	39.35	32.83	28.43	25.20	22.69
W330	550.	7635.	2.67	5.67	7.75	38.90	56.98	66.27	69.31	69.12	74.79	79.31	89.12	99.34
			109.93	117.61	116.31	120.16	126.70	127.68	51.07	39.38	32.85	28.44	25.21	22.70
W331	520.	7560.	2.80	5.68	7.74	33.69	50.47	59.36	64.31	65.84	71.27	75.48	84.79	94.26
			107.62	117.24	116.59	120.96	122.30	124.29	50.86	39.28	32.78	28.39	25.17	22.67
W332	530.	7680.	2.37	6.38	7.42	41.69	60.88	70.51	72.21	70.96	76.64	80.97	90.46	99.12
			110.22	117.25	117.48	121.24	128.70	129.81	51.16	39.42	32.87	28.46	25.22	22.71

= = RESULTS = =

COMPUTED WATER LEVEL DRAWDOWNS IN OBSERVATION WELLS (FT)

WELL NO	COORDINATES X	Y	ELAPSED TIME (DAYS)--- 182.00 2920.00	365.00 3286.00	547.00 3651.00	730.00 4016.00	912.00 4381.00	1095.00 4746.00	1277.00 5111.00	1460.00 5476.00	1642.00 5841.00	1825.00 6207.00	2190.00 6572.00	2555.00 6937.00
W333	550.	7715.	2.32	5.42	7.47	45.18	64.83	74.65	74.85	72.24	78.16	82.74	92.42	100.69
			109.98	117.52	118.05	121.09	128.01	128.90	51.21	39.44	32.89	28.47	25.23	22.71
W334	575.	7790.	2.09	5.39	7.47	46.72	67.44	77.70	77.56	74.98	81.53	86.57	96.46	102.86
			109.49	116.60	119.01	119.56	124.84	126.03	51.25	39.46	32.90	28.48	25.23	22.72
W335	610.	7635.	3.01	6.15	8.29	39.79	57.31	66.40	69.55	69.25	75.17	80.27	90.99	104.54
			110.53	118.19	113.05	113.09	112.04	112.86	51.03	39.37	32.84	28.44	25.21	22.70
W336	625.	7605.	3.28	6.42	8.59	37.82	54.64	63.45	67.79	68.40	74.32	79.52	90.67	105.38
			110.24	117.45	111.45	111.54	107.61	108.38	50.94	39.32	32.82	28.42	25.19	22.69
W337	600.	7620.	3.03	6.14	8.28	38.63	55.96	64.98	68.62	68.74	74.60	79.58	90.21	103.21
			110.30	117.89	113.20	113.57	111.91	112.76	51.01	39.35	32.83	28.43	25.20	22.69
W338	575.	7640.	2.79	5.85	7.96	39.69	57.64	66.89	69.77	69.36	75.16	79.92	90.09	101.32
			110.20	117.33	115.63	115.94	117.48	118.39	51.07	39.38	32.85	28.44	25.21	22.70
W339	560.	7675.	2.54	5.61	7.69	42.01	60.79	70.32	72.01	70.66	76.49	81.14	91.01	100.71
			110.13	117.54	116.47	119.41	126.05	126.96	51.15	39.41	32.87	28.46	25.22	22.71
W340	600.	7650.	2.88	6.00	8.13	40.79	58.70	67.93	70.48	69.72	75.66	80.67	91.16	103.51
			110.40	117.55	116.54	114.16	114.65	115.50	51.08	39.38	32.85	28.45	25.21	22.70
W401	750.	7295.	6.55	10.06	12.51	27.87	38.53	44.22	58.63	65.80	72.32	75.42	81.13	82.76
			78.26	100.01	68.90	91.79	77.57	77.84	49.24	38.52	32.32	28.07	24.93	22.48
W402	700.	7305.	5.64	8.95	11.30	26.89	38.11	44.37	56.98	63.40	69.65	73.13	79.71	83.30
			80.05	97.81	93.40	96.78	79.54	79.86	49.43	38.61	32.37	28.11	24.96	22.50
W403	650.	7325.	4.86	8.01	10.28	26.41	38.26	45.04	56.08	61.76	67.77	71.53	78.84	84.02
			82.25	98.50	99.79	103.93	82.09	82.47	49.65	38.71	32.43	28.15	24.99	22.53
W404	620.	7355.	4.42	7.48	9.71	26.77	39.24	46.39	56.42	61.51	67.37	71.32	79.33	85.73
			85.06	99.06	112.63	118.29	84.95	85.39	49.87	38.81	32.50	28.19	25.02	22.55
W405	585.	7365.	4.00	6.96	9.13	26.45	39.28	46.70	55.90	60.61	66.31	70.28	78.23	84.99
			85.52	97.10	112.28	118.81	86.46	86.95	49.96	38.85	32.52	28.21	25.03	22.56
W406	560.	7395.	3.67	6.58	8.71	27.04	40.48	48.20	56.60	60.80	66.39	70.42	78.70	86.14
			87.86	98.02	113.09	117.56	89.46	90.02	50.14	38.94	32.57	28.25	25.06	22.58
W407	585.	7415.	3.86	6.85	9.02	28.22	41.87	49.57	58.08	62.18	67.87	72.07	81.03	89.26
			90.71	99.03	113.98	120.04	90.78	91.36	50.23	38.98	32.60	28.27	25.08	22.60
W408	600.	7435.	3.94	6.98	9.17	29.23	43.12	50.87	59.29	63.21	68.96	73.32	82.89	91.99
			93.44	100.65	116.00	118.92	92.22	92.80	50.32	39.03	32.63	28.29	25.09	22.61
W409	600.	7460.	3.83	6.88	9.07	30.22	44.55	52.45	60.39	63.93	69.68	74.17	84.16	94.17
			96.42	102.64	115.58	115.14	94.63	95.27	50.44	39.09	32.67	28.31	25.11	22.62
W410	620.	7465.	4.00	7.11	9.33	30.70	44.98	52.80	60.97	64.56	70.39	75.03	85.54	96.26
			97.84	103.02	114.57	113.72	94.28	94.89	50.44	39.09	32.67	28.32	25.12	22.63
W411	645.	7460.	4.28	7.46	9.72	30.81	44.82	52.45	61.19	65.06	71.00	75.76	86.84	97.95
			98.15	102.18	115.94	111.95	92.68	93.24	50.39	39.06	32.66	28.31	25.11	22.62
W412	665.	7435.	4.64	7.88	10.18	30.16	43.59	50.90	60.62	65.07	71.11	75.77	86.79	96.64
			95.03	100.14	109.88	111.04	89.73	90.22	50.24	38.99	32.61	28.28	25.09	22.60

= = RESULTS = =

COMPUTED WATER LEVEL DRAWDOWNS IN OBSERVATION WELLS (FT)

WELL NO	COORDINATES X	Y	ELAPSED TIME (DAYS)--- 182.00	365.00	547.00	730.00	912.00	1095.00	1277.00	1460.00	1642.00	1825.00	2190.00	2555.00
			2920.00	3286.00	3651.00	4016.00	4381.00	4746.00	5111.00	5476.00	5841.00	6207.00	6572.00	6937.00
W413	690.	7410.	5.09	8.41	10.77	29.70	42.53	49.45	60.30	65.40	71.56	76.06	86.85	95.07
			91.49	98.47	105.16	107.11	86.82	87.25	50.06	38.91	32.56	28.24	25.06	22.58
W414	700.	7380.	5.39	8.74	11.13	28.99	41.27	47.90	59.59	66.22	71.45	75.61	85.33	91.75
			87.63	98.93	101.56	104.07	84.36	84.75	49.88	38.83	32.51	28.20	25.03	22.56
W415	715.	7350.	5.76	9.16	11.57	28.46	40.17	46.48	59.10	65.27	71.59	75.41	83.91	88.56
			84.09	99.25	96.94	99.72	81.89	82.24	49.67	38.73	32.45	28.16	25.00	22.53
W416	735.	7330.	6.18	9.66	12.10	28.38	39.63	45.63	59.19	65.84	72.27	75.79	83.36	86.56
			81.69	98.84	93.15	95.92	80.03	80.34	49.50	38.65	32.40	28.13	24.97	22.51
W417	650.	7365.	4.76	7.93	10.21	27.64	40.08	47.06	57.64	62.90	68.90	72.93	81.50	88.02
			86.30	98.30	112.48	116.22	84.92	85.35	49.89	38.83	32.51	28.20	25.03	22.56
W418	615.	7380.	4.29	7.35	9.57	27.50	40.40	47.72	57.31	62.08	67.91	72.00	80.60	87.83
			87.60	98.22	112.88	115.80	87.02	87.50	50.02	38.89	32.54	28.23	25.05	22.57
W419	590.	7395.	3.97	6.97	9.15	27.58	40.87	48.43	57.32	61.72	67.43	71.55	80.19	87.83
			88.70	97.94	112.20	116.76	88.88	89.41	50.12	38.93	32.57	28.25	25.06	22.58
W420	610.	7405.	4.15	7.21	9.42	28.28	41.61	49.11	58.23	62.64	68.44	72.67	81.79	89.90
			90.26	98.92	113.37	116.63	89.23	89.75	50.16	38.95	32.58	28.26	25.07	22.59
W421	625.	7435.	4.19	7.31	9.54	29.61	43.34	50.93	59.80	63.90	69.77	74.24	84.30	93.77
			94.20	100.75	114.16	117.26	91.34	91.89	50.29	39.02	32.63	28.29	25.09	22.61
W422	655.	7420.	4.60	7.80	10.09	29.51	42.78	50.06	59.85	64.44	70.43	74.92	85.26	94.22
			92.86	99.64	114.67	117.39	88.95	89.44	50.18	38.97	32.59	28.26	25.08	22.60
W423	665.	7395.	4.71	7.91	10.20	28.68	41.55	48.67	58.91	63.85	69.86	74.13	83.71	91.44
			89.72	98.69	114.21	117.89	87.01	87.46	50.05	38.90	32.56	28.24	25.05	22.58
W424	675.	7375.	5.06	8.32	10.65	28.40	40.80	47.64	58.71	64.11	70.22	74.34	83.53	90.16
			87.36	98.08	104.82	107.83	84.87	85.28	49.90	38.84	32.51	28.21	25.03	22.56
W425	635.	7400.	4.45	7.59	9.84	28.52	41.61	48.91	58.61	63.30	69.21	73.48	82.88	90.87
			90.13	98.90	112.75	115.35	88.05	88.54	50.10	38.93	32.57	28.25	25.06	22.58
W426	715.	7320.	5.86	9.24	11.64	27.65	38.95	45.12	58.08	64.66	70.89	74.42	81.57	85.14
			81.19	98.50	93.89	96.96	80.04	80.36	49.49	38.64	32.39	28.12	24.97	22.51
W427	690.	7340.	5.40	8.70	11.05	27.66	39.44	45.95	57.92	63.89	70.09	73.88	81.84	86.78
			83.49	98.36	98.50	101.74	82.03	82.39	49.67	38.72	32.44	28.16	25.00	22.53
W428	665.	7350.	5.01	8.22	10.53	27.46	39.57	46.35	57.50	63.09	69.16	73.07	81.27	87.05
			84.71	98.72	102.88	106.46	83.43	83.82	49.77	38.77	32.47	28.18	25.01	22.54
W429	590.	7490.	3.61	6.64	8.81	31.35	46.29	54.44	61.61	64.58	70.29	74.85	85.01	95.72
			99.60	105.59	115.65	114.29	98.21	98.92	50.58	39.15	32.71	28.34	25.13	22.64
W430	605.	7510.	3.64	6.72	8.90	32.46	47.66	55.87	62.78	65.47	71.24	75.99	86.67	98.52
			102.72	108.01	115.25	113.01	99.59	100.31	50.65	39.18	32.73	28.36	25.15	22.65
W431	630.	7520.	3.81	6.95	9.16	33.19	48.38	56.53	63.54	66.18	72.06	77.06	88.45	101.77
			104.94	108.53	114.77	111.25	99.03	99.70	50.66	39.19	32.74	28.36	25.15	22.65
W432	650.	7490.	4.16	7.35	9.61	32.05	46.54	54.35	62.48	65.86	71.81	76.82	88.56	101.72
			102.71	104.44	113.37	110.38	95.04	95.63	50.51	39.12	32.69	28.33	25.13	22.64

= = RESULTS = =

COMPUTED WATER LEVEL DRAWDOWNS IN OBSERVATION WELLS (FT)

WELL NO	COORDINATES X	Y	ELAPSED TIME (DAYS)--- 182.00	365.00	547.00	730.00	912.00	1095.00	1277.00	1460.00	1642.00	1825.00	2190.00	2555.00
			2920.00	3286.00	3651.00	4016.00	4381.00	4746.00	5111.00	5476.00	5841.00	6207.00	6572.00	6937.00
W433	625.	7500.	3.87	7.00	9.21	32.23	47.10	55.13	62.58	65.58	71.43	76.30	87.40	99.79
			102.46	106.35	114.58	112.01	97.39	98.05	50.59	39.16	32.71	28.35	25.14	22.64
W434	625.	7385.	3.37	6.17	8.24	26.00	39.42	47.26	55.27	59.40	64.84	68.74	76.52	83.47
			85.77	94.24	103.07	115.91	88.94	89.51	50.08	38.91	32.55	28.23	25.05	22.57
W435	500.	7400.	3.13	5.87	7.90	26.05	39.82	47.83	55.35	59.21	64.53	68.39	76.16	83.17
			86.18	94.06	101.58	116.83	90.40	91.02	50.16	38.94	32.57	28.25	25.06	22.58
W436	475.	7405.	2.93	5.59	7.59	25.71	39.63	47.76	54.96	58.67	63.89	67.67	75.28	82.13
			85.55	93.07	99.60	116.18	90.77	91.41	50.17	38.94	32.57	28.25	25.06	22.58
W437	450.	7430.	2.70	5.31	7.28	26.11	40.55	48.89	55.56	58.93	64.04	67.76	75.40	82.28
			86.44	93.53	99.09	116.48	92.91	93.60	50.27	38.99	32.60	28.26	25.07	22.59
W438	450.	7460.	2.64	5.27	7.24	27.31	42.34	50.84	57.13	60.16	65.26	68.99	76.87	84.05
			88.91	95.86	100.89	117.20	96.07	96.82	50.42	39.06	32.64	28.29	25.10	22.61
W439	475.	7470.	2.78	5.49	7.49	28.32	43.47	51.96	58.30	61.23	66.43	70.29	78.50	86.16
			91.24	98.36	103.56	118.01	97.70	98.48	50.49	39.10	32.67	28.31	25.11	22.62
W440	500.	7460.	2.99	5.76	7.80	28.43	43.30	51.65	58.35	61.46	66.78	70.75	79.16	87.12
			91.73	99.05	105.18	118.57	96.73	97.48	50.46	39.08	32.66	28.31	25.11	22.62
W441	530.	7445.	3.27	6.11	8.20	28.41	42.86	51.01	58.26	61.67	67.12	71.20	79.83	88.05
			91.76	99.31	107.23	120.15	94.87	95.56	50.40	39.06	32.65	28.30	25.10	22.61
W442	550.	7435.	3.47	6.36	8.48	28.38	42.56	50.56	58.22	61.85	67.39	71.53	80.30	88.62
			91.60	99.36	108.88	119.29	93.50	94.15	50.35	39.04	32.63	28.29	25.09	22.61
W443	520.	7405.	3.29	6.08	8.15	26.64	40.43	48.39	56.09	59.97	65.38	69.32	77.33	84.63
			87.43	95.55	104.05	116.47	90.83	91.45	50.19	38.96	32.59	28.25	25.07	22.59
W444	490.	7420.	3.01	5.73	7.76	26.60	40.75	48.92	56.08	59.67	64.95	68.81	76.71	83.93
			87.53	95.10	101.97	116.14	92.34	93.00	50.26	38.99	32.60	28.27	25.07	22.59
W445	475.	7445.	2.84	5.53	7.54	27.27	41.94	50.28	56.97	60.22	65.43	69.27	77.27	84.64
			89.01	96.26	102.14	116.23	94.85	95.57	50.37	39.04	32.63	28.29	25.09	22.61
W446	510.	7440.	3.12	5.91	7.96	27.81	42.26	50.46	57.56	60.96	66.33	70.31	78.64	86.44
			90.32	97.86	105.05	117.91	94.46	95.15	50.37	39.04	32.64	28.29	25.09	22.61
W447	530.	7425.	3.32	6.16	8.24	27.61	41.70	49.74	57.29	60.96	66.41	70.44	78.83	86.64
			89.76	97.65	106.33	118.01	92.75	93.39	50.30	39.01	32.62	28.28	25.08	22.60
W500	510.	7750.	2.01	5.07	7.08	45.90	66.64	76.75	76.60	73.84	79.67	83.79	93.00	99.66
			108.00	113.79	118.73	123.26	129.55	130.37	51.24	39.45	32.89	28.47	25.23	22.71
W501	450.	7765.	1.74	4.64	6.57	41.80	63.64	73.86	75.57	74.75	80.07	83.33	91.77	97.35
			104.51	109.15	118.92	122.09	129.80	131.05	51.20	39.43	32.87	28.45	25.22	22.70
W502	425.	7775.	1.62	4.45	6.35	40.80	63.24	73.51	75.54	75.10	80.16	83.00	91.10	96.27
			102.93	107.17	118.19	122.09	129.59	130.68	51.18	39.41	32.86	28.45	25.21	22.70
W503	410.	7800.	1.50	4.30	6.18	40.45	63.35	73.74	75.92	75.69	80.63	83.18	91.05	95.80
			101.93	105.74	115.97	120.83	131.99	133.23	51.16	39.40	32.85	28.44	25.20	22.69
W504	435.	7810.	1.55	4.47	6.38	41.35	63.90	74.35	76.38	76.01	81.33	84.31	92.56	97.34
			103.52	107.40	117.77	122.77	131.80	133.18	51.19	39.42	32.86	28.45	25.21	22.70

= = RESULTS = =

COMPUTED WATER LEVEL DRAWDOWNS IN OBSERVATION WELLS (FT)

WELL NO	COORDINATES X	Y	ELAPSED TIME (DAYS)--- 182.00 / 2920.00	365.00 / 3286.00	547.00 / 3651.00	730.00 / 4016.00	912.00 / 4381.00	1095.00 / 4746.00	1277.00 / 5111.00	1460.00 / 5476.00	1642.00 / 5841.00	1825.00 / 6207.00	2190.00 / 6572.00	2555.00 / 6937.00
W505	465.	7825.	1.60	4.67	6.62	42.31	64.62	75.17	77.06	76.59	82.41	85.92	94.65	99.37
			105.42	109.28	118.78	124.73	132.18	134.10	51.23	39.43	32.88	28.46	25.22	22.71
W506	480.	7830.	1.63	4.77	6.74	42.74	64.96	75.65	77.37	76.85	82.91	86.69	95.66	100.37
			106.34	110.20	117.44	123.38	130.58	132.55	51.24	39.44	32.88	28.46	25.22	22.71
W507	510.	7830.	1.72	4.98	6.99	43.70	65.64	76.24	77.76	76.95	83.39	87.68	97.04	101.93
			107.82	111.81	117.93	123.53	130.52	132.61	51.26	39.45	32.89	28.47	25.23	22.71
W508	535.	7830.	1.80	5.13	7.17	44.41	66.13	76.72	77.98	76.93	83.62	88.29	97.93	102.96
			108.68	112.73	118.29	123.13	129.46	131.60	51.26	39.46	32.89	28.47	25.23	22.72
W509	565.	7840.	1.85	5.29	7.36	44.74	66.37	76.99	78.22	77.23	84.25	89.37	99.32	104.26
			109.42	113.18	118.08	122.12	128.00	130.35	51.25	39.46	32.89	28.47	25.23	22.72
W510	585.	7840.	1.91	5.38	7.47	45.11	66.58	77.16	78.20	77.04	84.16	89.53	99.61	104.64
			109.48	113.08	117.15	120.59	126.71	128.78	51.24	39.45	32.89	28.47	25.23	22.72
W511	585.	7820.	2.00	5.40	7.48	45.85	66.99	77.43	77.94	76.15	83.05	88.33	98.34	103.94
			109.13	113.23	117.21	120.00	126.50	127.76	51.25	39.46	32.90	28.47	25.23	22.72
W512	575.	7800.	2.05	5.38	7.45	46.38	67.27	77.59	77.69	75.39	82.04	87.11	97.01	103.12
			109.02	114.07	118.28	120.78	126.51	127.85	51.26	39.46	32.90	28.48	25.23	22.72
W513	565.	7790.	2.06	5.34	7.40	46.58	67.40	77.68	77.59	75.05	81.55	86.47	96.28	102.59
			108.94	114.33	118.18	121.54	127.06	128.24	51.26	39.46	32.90	28.48	25.23	22.72
W514	545.	7770.	2.07	5.26	7.30	47.65	68.33	78.52	77.73	74.39	80.60	85.21	94.81	101.47
			108.72	114.33	118.56	122.37	128.73	128.15	51.26	39.46	32.90	28.47	25.23	22.72
W515	515.	7770.	1.95	5.07	7.08	46.07	67.08	77.30	77.20	74.56	80.55	84.76	94.03	100.32
			107.82	113.17	118.59	122.83	129.67	130.55	51.26	39.46	32.89	28.47	25.23	22.72
W516	480.	7770.	1.83	4.83	6.81	43.39	64.84	75.08	76.18	74.74	80.40	84.12	92.96	98.81
			106.18	111.12	118.41	122.52	129.97	131.14	51.24	39.44	32.88	28.46	25.22	22.71
W517	445.	7790.	1.64	4.56	6.49	41.68	63.91	74.26	76.09	75.46	80.83	83.99	92.37	97.53
			104.13	108.37	117.76	122.39	129.66	131.04	51.21	39.42	32.87	28.45	25.22	22.70
W518	475.	7805.	1.69	4.76	6.72	42.87	64.85	75.30	76.83	75.94	81.75	85.41	94.24	99.39
			105.86	110.12	118.19	123.31	129.13	130.77	51.24	39.44	32.88	28.46	25.22	22.71
W519	515.	7805.	1.82	5.02	7.04	44.59	66.13	76.57	77.45	75.92	82.16	86.45	95.78	101.27
			107.72	112.26	118.73	123.96	129.40	131.00	51.26	39.46	32.89	28.47	25.23	22.72
W520	545.	7815.	1.89	5.20	7.24	45.18	66.59	77.06	77.82	76.23	82.83	87.58	97.26	102.74
			108.69	113.13	118.38	122.65	128.08	129.86	51.26	39.46	32.90	28.47	25.23	22.72
W521	530.	7790.	1.93	5.13	7.16	45.84	67.01	77.34	77.53	75.26	81.52	85.98	95.44	101.42
			108.19	113.18	118.84	123.50	129.13	130.19	51.26	39.46	32.90	28.47	25.23	22.72
W522	500.	7785.	1.84	4.95	6.94	44.45	65.87	76.19	76.93	75.19	81.14	85.16	94.27	100.06
			107.08	111.94	119.28	124.05	129.60	130.93	51.25	39.45	32.89	28.47	25.23	22.71
W523	470.	7785.	1.74	4.74	6.71	42.80	64.59	74.93	76.34	75.28	80.91	84.47	93.20	98.67
			105.58	110.14	118.50	123.00	129.80	131.19	51.23	39.44	32.88	28.46	25.22	22.71
W524	450.	7680.	2.01	4.80	6.75	39.47	59.64	69.39	71.98	71.81	76.93	80.36	88.83	95.53
			104.41	110.16	112.51	115.63	128.53	129.79	51.11	39.38	32.85	28.44	25.20	22.69

= = RESULTS = =
COMPUTED WATER LEVEL DRAWDOWNS IN OBSERVATION WELLS (FT)

WELL NO	COORDINATES X	Y	ELAPSED TIME (DAYS)--- 182.00 / 2920.00	365.00 / 3286.00	547.00 / 3651.00	730.00 / 4016.00	912.00 / 4381.00	1095.00 / 4746.00	1277.00 / 5111.00	1460.00 / 5476.00	1642.00 / 5841.00	1825.00 / 6207.00	2190.00 / 6572.00	2555.00 / 6937.00
W525	420.	7695.	1.83	4.55	6.46	40.97	61.99	71.85	74.50	74.49	79.38	82.39	90.47	96.16
			103.91	108.65	111.14	113.30	128.43	129.81	51.09	39.37	32.84	28.43	25.20	22.69
W526	395.	7710.	1.70	4.35	6.22	39.33	61.30	71.24	73.92	74.01	78.65	81.25	88.98	94.38
			101.40	105.83	109.07	111.26	127.84	128.98	51.07	39.36	32.83	28.42	25.19	22.68
W527	370.	7725.	1.57	4.15	5.99	37.58	60.82	70.83	73.49	73.63	77.98	80.08	87.43	92.61
			99.02	103.21	106.81	108.88	126.82	127.93	51.03	39.34	32.81	28.41	25.18	22.68
W528	355.	7745.	1.47	4.01	5.83	37.19	61.86	71.95	74.47	74.53	78.63	80.26	87.31	92.25
			98.22	102.12	105.78	107.48	126.09	127.18	51.02	39.33	32.81	28.41	25.18	22.67
W529	345.	7775.	1.37	3.90	5.69	37.57	62.72	72.93	75.34	75.34	79.33	80.66	87.52	92.14
			97.78	101.33	105.03	106.40	126.52	127.73	51.01	39.32	32.80	28.40	25.17	22.67
W530	350.	7795.	1.34	3.90	5.69	38.38	62.71	73.00	75.41	75.44	79.55	81.02	88.00	92.44
			98.03	101.45	105.39	106.87	126.80	127.92	51.03	39.33	32.81	28.40	25.18	22.67
W531	370.	7810.	1.36	4.01	5.83	39.38	63.01	73.40	75.77	75.76	80.17	81.99	89.26	93.66
			99.33	102.74	107.36	109.31	127.13	128.32	51.07	39.35	32.82	28.42	25.19	22.68
W532	455.	7695.	1.98	4.80	6.76	40.36	60.81	70.64	72.92	72.47	77.66	81.11	89.63	96.23
			105.07	110.73	113.48	116.61	128.14	129.28	51.14	39.40	32.86	28.44	25.21	22.70
W533	430.	7710.	1.83	4.59	6.51	40.67	61.87	71.81	74.18	73.91	78.89	81.98	90.17	96.05
			103.88	108.81	112.24	114.90	128.12	129.30	51.13	39.39	32.85	28.44	25.20	22.69
W534	410.	7730.	1.70	4.42	6.31	39.99	62.09	72.13	74.51	74.32	79.12	81.85	89.76	95.21
			102.31	106.80	111.17	113.74	128.01	129.19	51.12	39.38	32.84	28.43	25.20	22.69
W535	390.	7740.	1.60	4.26	6.12	38.98	61.88	71.96	74.41	74.36	78.93	81.28	88.88	94.09
			100.70	104.93	109.38	111.75	127.68	128.89	51.09	39.37	32.83	28.42	25.19	22.69
W536	375.	7755.	1.51	4.13	5.97	38.42	62.15	72.30	74.73	74.69	79.08	81.09	88.45	93.43
			99.64	103.61	108.08	110.21	126.83	127.96	51.07	39.35	32.82	28.42	25.19	22.68
W537	370.	7785.	1.42	4.05	5.88	38.82	62.73	73.01	75.38	75.33	79.69	81.53	88.80	93.46
			99.34	103.00	107.74	109.79	126.09	127.26	51.07	39.35	32.82	28.42	25.19	22.68
W538	400.	7775.	1.54	4.27	6.14	39.81	62.83	73.09	75.33	75.12	79.86	82.28	90.00	94.97
			101.32	105.32	111.62	114.54	128.21	129.52	51.13	39.38	32.84	28.43	25.20	22.69
W539	415.	7765.	1.61	4.39	6.28	40.32	62.87	73.09	75.23	74.89	79.80	82.49	90.45	95.65
			102.33	106.58	113.41	116.58	129.02	130.29	51.15	39.40	32.85	28.44	25.20	22.69
W540	445.	7745.	1.78	4.63	6.57	41.39	63.01	73.13	74.98	74.26	79.46	82.67	91.05	96.83
			104.34	109.19	115.01	118.31	129.43	130.60	51.19	39.42	32.87	28.45	25.21	22.70
W541	470.	7725.	1.94	4.85	6.81	42.02	62.86	72.85	74.42	73.34	78.72	82.31	91.02	97.48
			105.99	111.54	115.51	118.95	129.17	130.29	51.19	39.42	32.87	28.46	25.22	22.71
W542	475.	7860.	1.52	4.72	6.69	42.23	64.80	75.56	77.88	77.94	84.19	87.96	96.95	101.07
			106.54	109.89	113.95	117.04	124.18	127.43	51.22	39.43	32.87	28.46	25.22	22.70
W543	490.	7885.	1.48	4.86	6.86	42.22	64.99	75.92	78.70	79.29	86.12	90.30	99.70	103.32
			108.40	111.39	113.20	115.19	121.76	125.38	51.20	39.42	32.87	28.45	25.22	22.70
W544	515.	7900.	1.50	5.15	7.20	42.51	65.41	76.51	79.83	81.02	88.77	93.69	103.81	106.97
			111.73	114.46	114.09	115.19	121.14	125.03	51.20	39.42	32.87	28.45	25.22	22.70

= = RESULTS = =

COMPUTED WATER LEVEL DRAWDOWNS IN OBSERVATION WELLS (FT)

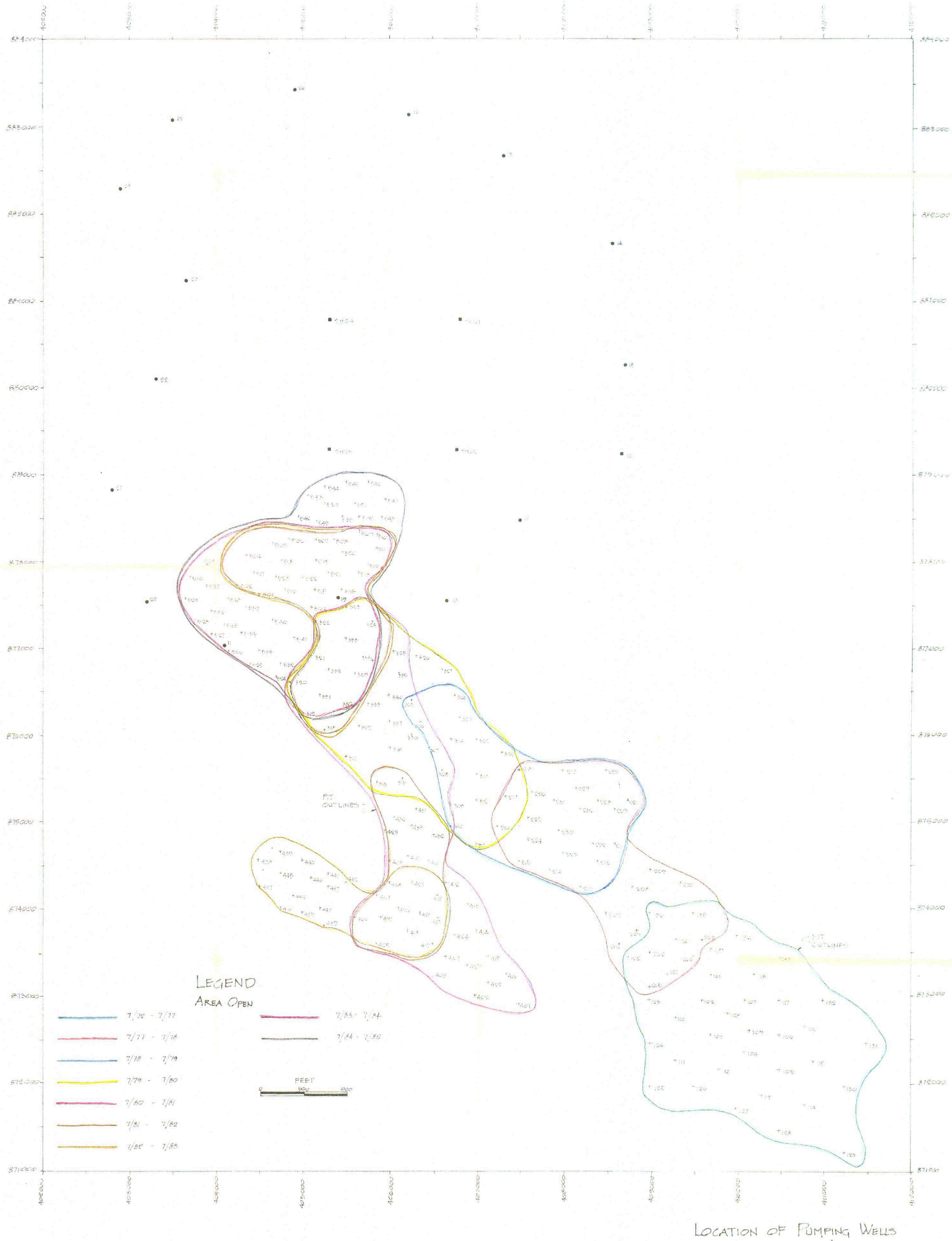
WELL NO	COORDINATES X	Y	ELAPSED TIME (DAYS)--- 182.00 / 2920.00	365.00 / 3286.00	547.00 / 3651.00	730.00 / 4016.00	912.00 / 4381.00	1095.00 / 4746.00	1277.00 / 5111.00	1460.00 / 5476.00	1642.00 / 5841.00	1825.00 / 6207.00	2190.00 / 6572.00	2555.00 / 6937.00
W545	535.	7900.	1.55	5.27	7.35	42.77	65.57	76.68	79.94	81.11	89.10	94.35	104.70	107.89
			112.50	115.19	114.38	115.33	120.93	125.48	51.20	39.43	32.87	28.46	25.22	22.71
W546	565.	7900.	1.62	5.31	7.39	42.94	65.51	76.53	79.36	80.17	88.03	93.50	103.82	107.23
			111.56	114.19	113.35	114.20	119.28	122.92	51.20	39.43	32.87	28.46	25.22	22.71
W547	580.	7880.	1.74	5.35	7.43	43.67	65.83	76.69	78.84	78.94	86.54	92.06	102.30	106.26
			110.63	113.51	113.60	114.92	119.88	123.51	51.21	39.44	32.88	28.46	25.22	22.71
W548	580.	7860.	1.82	5.35	7.43	44.33	66.16	76.89	78.51	78.02	85.36	90.77	100.91	105.38
			110.01	113.24	114.66	116.68	121.87	125.34	51.23	39.45	32.89	28.47	25.23	22.71
W549	500.	7855.	1.60	4.91	6.92	42.91	65.26	76.01	78.15	78.02	84.63	88.85	98.21	102.49
			107.97	111.46	115.27	118.58	125.20	128.72	51.24	39.44	32.88	28.46	25.22	22.71
W550	510.	7875.	1.57	5.01	7.04	42.78	65.33	76.22	78.79	79.16	86.22	90.75	100.42	104.26
			109.38	112.53	114.49	116.78	123.05	126.95	51.23	39.44	32.88	28.46	25.22	22.71
W551	545.	7875.	1.66	5.22	7.28	43.38	65.71	76.59	78.96	79.19	86.61	91.70	101.74	105.68
			110.53	113.64	114.80	116.76	122.40	126.39	51.23	39.44	32.88	28.46	25.22	22.71
W552	550.	7860.	1.73	5.22	7.28	43.85	65.91	76.68	78.59	78.32	85.53	90.57	100.52	104.87
			109.89	113.27	115.49	118.02	123.71	127.45	51.24	39.45	32.89	28.47	25.23	22.71
W553	530.	7860.	1.67	5.12	7.16	43.48	65.69	76.47	78.55	78.42	85.46	90.22	100.00	104.26
			109.47	112.89	115.53	118.31	124.34	128.15	51.24	39.45	32.89	28.47	25.23	22.71

TABLE A-2

EFFECTIVE DRAWDOWNS IN OPEN PITS

Pumping Period		Effective Drawdown (feet)
Day Reference	Date	
182.	1/73	18.2 (1)*
365.	7/73	18.2 (1)
547.	1/74	18.2 (1)
730.	7/74	45.6 (1)
912.	1/75	45.6 (1)
1,095.	7/75	45.6 (1)
1,277.	1/76	87.3 (1)
1,460.	7/76	87.3 (1)
1,642.	1/77	87.3 (1)
1,825.	7/77	87.3 (1) 67.5 (2)
2,190.	7/78	97.0 (2)
2,555.	7/79	107.0 (2)
2,920.	7/80	107.0 (2)
3,286.	7/81	117.0 (3) 97.0 (4)
3,651.	7/82	117.0 (3) 112.0 (4)
4,016.	7/83	122.0 (3) 117.0 (4)
4,381.	7/84	127.0 (4)
4,746.	7/85	130.0 (4)
5,111.	7/86	0
5,476.	7/87	0
5.841.	7/88	0
6,207	7/89	0
6,572.	7/90	0
6,937.	7/91	0

*pit number



LOCATION OF PUMPING WELLS
GROUND WATER MODEL

PLATE A-1