Supreme Court, U. S.
FILED
MAR 19 1974
MICHAEL RODAK, JR., CLERK

IN THE
Supreme Court of the United States

No. 31, Original

OCTOBER TERM, 1967

STATE OF UTAH, PLAINTIFF

v.

UNITED STATES OF AMERICA, DEFENDANT

REPORT OF SPECIAL MASTER

CHARLES FAHY,
Senior Circuit Judge,
Special Master.

CONTENTS

Exhibits P-4, P-5, P-9, P-10, P-11, P-12, P-17, and D-2, D-3 and D-6 are reproduced following Appendix A.

IN THE

Supreme Court of the United States

No. 31, Original

OCTOBER TERM, 1967

STATE OF UTAH, PLAINTIFF

v.

UNITED STATES OF AMERICA, DEFENDANT

REPORT OF SPECIAL MASTER

To the Chief Justice and Associate Justices of the Supreme Court of the United States:

I. INTRODUCTION

This Report of the Special Master is concerned with another stage of the controversy between the State of Utah and the United States over the ownership of certain land, and its content, within the surveyed meander line[1] of the Great Salt Lake.

---

[1] The meander line of the Great Salt Lake is the line duly surveyed prior to and in accordance with section 1 of the Act of June 3, 1966, 80 Stat. 192, which provides:

> That the Secretary of the Interior shall within six months of the date of the passage of this Act complete the public land survey around the Great Salt Lake in the State of

Pursuant to the terms of the Act of Congress of June 3, 1966, 80 Stat. 192, as amended, 80 Stat. 349, the Secretary of the Interior on June 15, 1967, by quitclaim deed conveyed to Utah all interests of the United States in these lands, including brines and minerals in solution in the brines, or precipitated or extracted therefrom,[2] conditioned upon payment by Utah to the United States of the market value of the interests covered by the deed should it be determined that they actually belonged to the United States. To have that question judicially determined Utah adopted one of the alternative courses authorized by the Act by filing this original suit in the Supreme Court seeking a decree to quiet its title as against the United States to the lands and content in dispute. See section 5(b) of the Act.

Several phases of the over-all controversy have been decided by the Court. In *Utah* v. *United States*, 394 U.S. 89 (1969), the Court denied intervention of a private claimant, Morton International, Inc., approving the recommendation of the late Senior Circuit Judge J. Cullen Ganey, Special Master. In *Utah* v. *United States,* 403 U.S. 9 (1971), again on the basis of the Report of Judge Ganey, the Court held that the Lake was navigable when the State of Utah was admitted to the Union on January 4, 1896, and that, as a consequence, under the equal-footing doctrine,[3] title to the bed of the Lake at state-

---

Utah by closing the meander line of that Lake, following as accurately as possible the mean high water mark of the Great Salt Lake used in fixing the meander line on either side of the unsurveyed area.

[2] When "land", "lands", "bed of the Lake" appear in this Report to describe the interests involved the words are used to include the brines and minerals in solution in the brines or precipitated or extracted therefrom.

[3] *Pollard's Lessee* v. *Hagen,* 44 U.S. (3 How.) 212, 221-23, 228-30 (1845); *Bonelli Cattle Co.* v. *Arizona,* 414 U.S. 313

hood vested in Utah. Thereupon the Court, in *Utah* v. *United States*, 406 U.S. 484, entered its decree of May 22, 1972, in the form of an injunction against the United States, but in substance quieting in Utah, as against the United States, the title to the bed of the Lake lying below its water's edge on June 15, 1967, the date of the quitclaim deed, with exceptions not now material, and to the natural resources and living organisms therein or extracted therefrom. The Court also held that Utah is not required to pay the United States for the interests thus described in the decree.

The decree of May 22, 1972, by its paragraph 3, brings us to the present problem. It provides as follows:

> 3. The basic question yet to be determined in this case is whether prior to June 15, 1967, the claimed doctrine of reliction applies and, if so, whether the doctrine of reliction vests in the United States, and thus divests the State of Utah, of any right, title or interest to any or all of the exposed shorelands situated between the water's edge on June 15, 1967, and the meander line of the Great Salt Lake as duly surveyed prior to or in accordance with § 1 of the Act of June 3, 1966, 80 Stat. 192. A Special Master will be appointed by the Court to hold such hearings, take such evidence and conduct such proceedings as he deems appropriate and, in due course, to report his recommendations to the Court.

406 U.S., at 484-5. Judge Ganey in the meantime having died the Court appointed the present Special Master, with the authority thus noted. 406 U.S. 940 (1972).

(1973). Under this doctrine, in the absence of a congressional condition to the contrary, a State, upon its admission to the Union, acquires title to the bed of navigable waters within the State, as had the thirteen original colonies as successors to the rights of the British Crown.

Not at issue in this litigation are the claims of private persons, vendees and patentees, to about 275,000 acres adjacent to the Lake.

Following the decree of May 22, 1972, the parties engaged in a cooperative and successful effort to clarify and delineate the issues now considered. This was followed by a hearing before the Special Master at the United States Court House in the District of Columbia on February 27, 1973, at which a large number of exhibits were introduced in evidence, and oral testimony adduced. The exhibits incorporate detailed factual data regarding the Lake and its history, the accuracy of which is accepted by the parties.[4] Briefs followed and the case was taken under submission on October 25, 1973, for preparation of this Report. As it was nearing completion, however, the Court decided *Bonelli Cattle Co.* v. *Arizona*, 414 U.S. 313 (1973), following which the parties have advised the Special Master of their views as to the bearing of *Bonelli* upon this case.

It is now important to note that, in accordance with the desire of both the United States and Utah, the basic question now considered is limited to whether the doctrine of reliction divested Utah of title to that part of the bed of the Lake at statehood which on June 15, 1967, the date of the quitclaim deed, had become exposed by recession of the waters of the Lake, comprising some 325,000 acres. *Infra*, p. 24. The title to any upland between the bed of the Lake at statehood and the meander line is not now considered, the positions of the parties in that regard being reserved pending the answer to the above question.

II. SUMMARY OF RECOMMENDED CONCLUSIONS

The Special Master recommends that the Court hold that the State of Utah has not been divested by reason

---

[4] Reproduced as part of this Report are Plaintiff's Exhibits 4, 5, 9, 10, 11, 12 and 17, and Defendant's Exhibits 2, 3 and 6. The originals of all the Exhibits are on file with the Clerk of the Court.

of the doctrine of reliction of any right, title or interest to that part of the bed of the Great Salt Lake acquired by it at statehood which had become exposed by recession of the waters of the Lake to June 15, 1967; that Utah is entitled to a decree quieting its title as against the United States to the area thus described insofar as any claim thereto by the United States rests upon the doctrine of reliction; and that no compensation is due from the State of Utah to the United States under the Act of June 3, 1966, for said area.

III. FEDERAL LAW CONTROLS

Under the recent decision of the Court in *Bonelli, supra,* it seems clear that federal law governs the decision of this case. The land, title to which was in dispute in *Bonelli,* abutted the Colorado River, a navigable stream. Title to the bed of the river had been acquired by Arizona at statehood under the equal-footing doctrine. The riparian owner, Bonelli Cattle Company, held title which stemmed from a federal patent.[5] Prior to the litigation the river by erosion had inundated part of the Bonelli land, thus extending the river bed eastward. Thereafter the United States, with the acquiescence of Arizona, rechanneled the river for navigational purposes and caused the eroded area to be reexposed. Bonelli Cattle Company as the riparian landowner claimed the exposed area under the doctrine of accretion. The Court held that this question was to be decided under the federal common law of accretion, not under state law. It follows, in the view of the Special Master, that the related question of reliction as now presented must also be decided under federal

---

[5] In *Bonelli* the claimant against the State under the doctrine of accretion held title under a federal patent to a predecessor in title; but it was not clear whether the land covered by the patent was riparian at the date of the patent. *See* 414 U.S. at 321, n.11.

law. As with respect to Arizona in *Bonelli,* so with respect to Utah now, the title of each State accrued under the equal-footing doctrine, and the riparian owner in each case claims title to the upland under the United States.

The Court held in *Bonelli:*

> We continue to adhere to the principle that it is left to the States to determine the rights of riparian owners in the beds of navigable streams which, under federal law, belong to the State. But this doctrine does not require that state law govern the instant controversy. The issue before us is not what rights the State has accorded private owners in lands which the State holds as sovereign; but, rather, how far the State's sovereign right extends under the equal-footing doctrine and the Submerged Lands Act—whether the State retains title to the lands formerly beneath the stream of the Colorado River or whether that title is defeasible by the withdrawal of those waters. As this Court observed in *Borax, Ltd.* v. *Los Angeles,* 296 U.S. 10, 22 (1935): "The question as to the extent of this federal grant, that is as to the limit of the land conveyed, . . . is necessarily a federal question. . . . [I]t involves the ascertainment of the essential basis of a right asserted under federal law."

414 U.S. at 319-20.

While the United States is free to adopt or to acquiesce in the application of state law even though otherwise federal law would govern,[6] the Court in *Bonelli* held that it had not done so by the Submerged Lands Act, 43 U.S.C. §§ 1301, *et seq.*, so holding in terms which the Special Master considers applicable as well to the present case:

---

[6] *United States* v. *Oregon,* 295 U.S. 1, 28 (1935); *Hughes* v. *Washington,* 389 U.S. 290, 292-93 (1967).

> The [Submerged Lands] Act did not abrogate the federal law of accretion, but defined lands beneath navigable waters as being those covered by streams as "hereafter modified by accretion, erosion, and reliction." . . . Since the Act does not extend to the States any interest beyond those afforded by the equal-footing doctrine, the State can no more base its claim to lands unnecessary to a navigational purpose on the Submerged Lands Act than on that doctrine. (Footnote omitted.)[7]

414 U.S. at 324-25.

IV. HISTORY AND GENERAL CHARACTERISTICS OF THE GREAT SALT LAKE

The Report of Special Master Ganey, filed October 26, 1970, contains in considerable detail the history and characteristics of the Lake. These are now outlined, beginning with the testimony before the present Special Master on February 27, 1973, of Mr. Theodore Arnow,[8] a joint expert witness. He described the Lake as located entirely within Utah and as a remnant of the ancient Bonneville Lake, one of the last major lakes formed in geological time in the Great Basin.[9] Before it began to dry

---

[7] By analogous reasoning the reliance of the State upon the Rules of Decision Act, 28 U.S.C. § 1652, cannot be accepted as a basis for applying state law in light of *Bonelli,* all else aside. It was not applied in either *Hughes* v. *Washington, supra,* or *Bonelli.*

[8] Mr. Arnow is the District Chief of the Water Resources Division of the Geological Survey in Utah charged with the responsibility of gathering statistical data regarding the Lake.

[9] The Great Basin is located in Western Utah, most of Nevada and smaller parts of other States. Although the climate in the Great Basin is now arid with less precipitation than evaporation, many centuries ago the climate was more humid so that lakes which formed there would in alternate periods dry up and then form once again.

up over 20,000 years ago Lake Bonneville covered approximately 35,000 square miles, about the size of Lake Superior and twenty times the area of the Great Salt Lake. The Great Salt Lake is about 70 miles long and 30 miles wide, with a volume of 15,000,000 acre-feet covering about 1,650 square miles. Its maximum depth is 34 feet. The Lake is surrounded by very flat shorelands except where mountain ranges project upward through the water.[10] The flat shorelands are vast mud flats barren of any vegetation due to the high salinity of the Lake, and are used for nothing except recreation and as evaporation ponds for extracting minerals and salts. (Tr. 33.) A visual illustration of the general nature of the mud flats can be obtained from Exhibit P-6 which contains twelve color photographs of the shore as it appeared on February 12, 1972, when covered with snow. The Exhibit also contains twenty-four black and white photographs showing the mud flats as they appeared on October 26, 1972, with no snow. Both sets of photographs contain maps showing the location of each photograph and a description of the view illustrated.

The Lake has no outlet and thus no way of discharging the water which it receives by the inflow of tributary streams and by precipitation. The water level also is influenced by man-made interferences with the rate of inflow.[11] The only "outflow" from the Lake is by evaporation. (Tr. 36.)

---

[10] Judge Ganey's Report filed October 26, 1970, states in his Finding No. 18, p. 21, in part as follows:

> Except for an area at the southeastern shore near the base of the Oquirrh Mountains, where the beaches are located, the Lake is surrounded by stretches of salt flats, marshes or bogs, some of which are in places several miles in width. (Footnote omitted.)

[11] Exhibit P-18 demonstrates that the Lake would be at a higher vertical elevation if man had not interfered with the

The rate of evaporation and the resulting changes in the elevation of the Lake depend upon wind, temperature, salinity of the water and the surface area of the Lake, which is affected by the rate of tributary inflow and the degree of salinity. The periods of maximum inflow, the late fall and the spring, precede the period of maximum evaporation, during the summer. The Lake is continually fluctuating due to these interrelated factors.

Records of the Lake were kept first by the Mormons who arrived in the area in 1847, Mr. Arnow continued. At that time the elevation of the Lake was approximately 4200 feet above sea level.[12] Exhibit P-4. At statehood in 1896 the elevation of the Lake was 4200.2 feet. In February, 1973, at the time of the hearing before the Special Master, the elevation was approximately 4200 feet, within a few inches of the statehood figure. (Tr. 37-38; Exhibit P-4. And see Tr. 18; Post-Trial Brief of United States, p. 19, n.13.) Therefore, in February, 1973, the relation of the waters of the Lake to the adjoining shorelands was about as it was at statehood, quite different from what it was on June 15, 1967, the date of the quitclaim deed.

Since statehood the Lake has fluctuated as much as thirteen feet from a high of 4205 feet in 1924 to a low of 4192 feet in 1963.[13] The fluctuations have followed no set pattern on either a long range or short range basis, whether measured at five year intervals, one year inter-

---

natural rate of inflow. However, this does not change the nature of the fluctuations of the water level which would still fluctuate as dramatically and frequently but at a higher elevation.

[12] In noting at different places in this Report the level or elevation of the Lake the numerals in each instance refer to "above sea level."

[13] The Lake reached its highest elevation in 1873, prior to statehood, when its level rose to 4212 feet. *See* Exhibit P-4.

vals, six month intervals, monthly intervals, or even daily or hourly intervals. See Exhibits P-8—P-17.

Special reference is made by the Special Master to the map marked as Exhibit D-2. The area of the bed of the Lake exposed between statehood and the date of the quitclaim deed is shown in the dark shading, dark blue in the original. The large light area represents the bed at the date of the quitclaim deed, light blue in the original. The area between the bed of the Lake at statehood and the surveyed meander line is the exterior medium shading, green in the original.

V. FACTUAL CHARACTERISTICS OF THE RELICTION PROCESS

The land of a riparian owner may be affected by the action of the water by avulsion, erosion, accretion and reliction. Neither avulsion nor erosion is involved. The former occurs when there is a sudden or violent change in the course of a stream, in which event the title lines remain as before. *County of St. Clair* v. *Lovingston,* 90 U.S. (23 Wall.) 46, 68 (1874); *Philadelphia Co.* v. *Stimson,* 223 U.S. 605, 624-25 (1912); *Bonelli, supra,* 414 U.S. at 327. Erosion is the gradual washing away of land by the water, thus extending its bed and simultaneously contracting the riparian land. See *Arkansas* v. *Tennessee,* 246 U.S. 158, 173 (1918); *United States* v. *461.42 Acres of Land,* 222 F.Supp. 55 (N.D. Ohio, 1963).

At common law accretion was the enlargement of the riparian land by the action of the water in gradually and imperceptibly depositing soil. See *Mississippi* v. *Arkansas,* — U.S. — (February 26, 1974). Reliction had this common characteristic of a gradual and imperceptible change in the relation of the water to the land, but by uncovering existing land rather than, as in accretion, depositing additional soil. The Court in *Bonelli* affirmed these characteristics of accretion and reliction:

> Federal law recognizes the doctrine of accretion whereby the "grantee of land bounded by a body of navigable water acquires a right to any natural and gradual accretion formed along the shore." *Hughes* v. *Washington,* 389 U.S. 290, 293 (1967); accord, *Jones* v. *Johnson,* 18 How. 150, 156 (1856). When there is a gradual and imperceptible accumulation of land on a navigable riverbank, by way of alluvion or reliction, the riparian owner is the beneficiary of title to the surfaced land:
>
>> "It is the established rule that the riparian proprietor of land bounded by a stream, the banks of which are changed by the gradual and imperceptible process of accretion or erosion, continues to hold the stream as his boundary; if his land is increased he is not accountable for the gain, and if it is diminished he has no recourse for the loss." *Philadelphia Co.* v. *Stimson,* 223 U.S. 605, 624 (1912).

414 U.S. at 325-26.

As had been stated in *Hughes* v. *Washington, supra,* 389 U.S. at 293, land gained by accretion is "by little and little, by small and imperceptible degrees," and belongs to the riparian owner. The Court continued:

> The Court has repeatedly reaffirmed this rule, *County of St. Clair* v. *Lovingston,* 23 Wall. 46 (1874); *Jefferis* v. *East Omaha Land Co.,* 134 U.S. 178 (1890), and the soundness of the principle is scarcely open to question. Any other rule would leave riparian owners continually in danger of losing the access to water which is often the most valuable feature of their property, and continually vulnerable to harassing litigation challenging the location of the original water lines. (Footnote omitted.)

The earlier English case of *The King* v. *Lord Yarborough,* 107 Eng.Rep. 668 (K.B. 1824), states the common law principle. The claim was that the land in dispute "being slowly, gradually, and by imperceptible increase, in long time cast up, deposited, and settled by and from the flux and reflux of the tide and water of the sea" upon the "extremity of the demesne lands of the manor, [the projection] hath been formed, and hath been settled, grown, and accrued upon . . . the demesne lands. . . ." *Id.* at 673.

The court there held,

> It is clear upon the evidence, that the land has been formed slowly and gradually in the way mentioned in the plea . . . [a]nd considering the word "imperceptible" in this issue, as connected with the words "slow and gradual," we think it must be understood as expressive only of the manner of the accretion, as the words undoubtedly are, and as meaning imperceptible in its progress, not imperceptible after a long lapse of time. . . .

Id. at 674.

It is interesting to compare this statement of 1824 with that of the Supreme Court of Utah in 1971 in *Utah* v. *Hardy*, 26 Utah 2d 143, 486 P.2d 391. Although Utah law does not govern this case, the United States in its brief before the Special Master recognizes that the opinion of the Supreme Court of Utah defines reliction "in terms perfectly consonant with the federal common law":

> The doctrine of "reliction" in the law covers the situation involving the title to the land which emerges from beneath a body of water caused by a recession of the waters. The law of reliction is generally the same as that of accretion as it concerns contiguity, imperceptibility and naturalness of the process of the water's recession and the exposure of additional land. The law of reliction, as well as accretion, has evolved over a long period of time and is based upon the rights of a riparian owner to have access to the water adjacent to his property.

26 Utah 2d at 144-45, 486 P.2d at 392-93. The court held, however, after reviewing the "unique and special conditions" affecting Great Salt Lake,

> . . . that the recession of the waters from the land [there in question] has not been natural, gradual

> and imperceptible, and that the doctrine of reliction should not be applied.

26 Utah 2d at 145, 486 P.2d at 393.

It is now clear, however, from *Bonelli* that under federal common law though accretion may occur as formerly by the gradual and imperceptible process which evolved under the non-federal common law, it may also occur in a perceptible manner at least where the owner of the bed of the navigable water is a State which acquired title to the bed under the equal-footing doctrine. In this regard the Court in *Bonelli* holds:

> The [earlier] advance of the Colorado's waters divested the title of the upland owners in favor of the State in order to guarantee full public enjoyment of the watercourse. But, when the water receded from the land, there was no longer a public benefit to be protected; consequently, the State, as sovereign, has no need for title. That the course of the recession was artificial, or that the rate was perceptible, should be of no effect.[14]

414 U.S. at 323-24.

---

[14] We have seen that some decisions refer to accretion or reliction as an addition to land by natural causes:

> A long and unbroken line of decisions of this Court establishes that the grantee of land bounded by a body of navigable water acquires a right to any natural and gradual accretion formed along the shore.

Hughes v. *Washington, supra,* 389 U.S. at 293; *and see Jones* v. *Johnston,* 59 U.S. (18 How.) 150, 158 (1856), both referred to in *Bonnelli,* 414 U.S. at 325; *Utah* v. *Hardy, supra,* 26 Utah 2d at 144-45, 486 P.2d at 392-93. *But see County of St. Clair* v. *Lovingston, supra,* also cited in *Bonelli* at 327. In the present case, according to the testimony of Mr. Arnow, supported by reference to Exhibit P-18, the following appears:

> . . . the lake would have been 3.7 feet higher at the time of statehood if it weren't for the activities of man in the basin. . . . [C]arrying it through 1967. . . . the difference

Postponing for consideration under Part VII, *infra,* the view of the Special Master that a reasonably permanent or stable result of the process is essential to a finding of reliction, and recognizing that under *Bonelli* reliction, as accretion, may at times occur perceptibly, it seems appropriate first to consider the claim of the United States that the recession of the Lake as of June 15, 1967, the date of the quitclaim deed, had occurred by the "little by little" or gradual and imperceptible process, and for that reason Utah had lost the area in question to the United States under the reliction doctrine.

VI. THE SPECIAL MASTER IS UNABLE TO FIND THAT THE EXPOSURE OF THE BED OF THE GREAT SALT LAKE JUNE 15, 1967, THE DATE OF THE QUITCLAIM DEED, HAD COME ABOUT BY A GRADUAL AND IMPERCEPTIBLE PROCESS

The term "fluctuations" is used herein to mean, unless otherwise indicated, the reactions of the waters of the Lake, aside from responses to the wind, to changes in the elevation or level of the Lake. The United States points out that the Lake experiences three general types of fluctuations, annual, seasonal and daily. Upon this factual basis the United States centers its claim that reliction accounts for the exposure of the shorelands between statehood and June 15, 1967, since, it is said, only the annual fluctuation reflects a change in the ordinary high water mark, which, according to the United States, is that boundary subject to modification by reliction. Thus, we

---

> is . . . 5.28 feet higher in 1967 than it actually was, if it weren't for the activities of man.

(Tr. 44.) Except for these activities the bed of the Lake would not have been exposed as of June 15, 1967 to the extent this had occurred. The State of Utah, however, has not pressed before the Special Master reliance upon the effect due to the activities of man.

are urged to look only to annual "fluctuations" of the level of the Lake, for daily fluctuation allegedly is caused by the wind and is not a change in the level of the Lake, and seasonal fluctuation recurs each year in essentially the same pattern. Exhibit P-4. On the other hand, the annual change is a product of every physical factor affecting the level of the Lake, see pages 8-9, *supra*, and is measured, according to the United States, by differences in the "average yearly stage" of the Lake, which is the average of the levels of the Lake at regular intervals over a 12-month cycle. Exhibit D-6.

Therefore, the United States continues, the "average yearly stage" of the Lake is the proper standard for measuring the level of the Lake. This "average annual change" since statehood has generally been less than 1 foot per year. However, since some of the shorelands are extremely flat, the water moves almost in a horizontal direction and a small change in the level of the Lake can inundate or expose hundreds of feet of shoreland. Thus, the annual average change in level of only .69 feet (8.28 inches) would expose or inundate about 50,000 acres of shoreland. Exhibit P-5. The shoreline of the Lake is 350 lineal miles, with the result, it is said, that an average annual movement along the shore is less than 1200 feet, barely 3 feet per day or a little over 1½ inches per hour. The United States accordingly concludes that such a movement is not humanly perceptible as it occurs, adding, "[n]one of the changes in the level of the Great Salt Lake have been of so sudden or violent a character as to be perceptible while the process was going on." Exhibits P-18, D-4.[15]

It should be noted that in distributing the 50,000 acres of shoreland among the 350 lineal miles consideration was

---

[15] According to the United States the most extreme change in the boundary occurred between 1906 and 1907 and amounted to less than 15 inches per hour.

not given to the fact that the shorelands are not uniformly affected by change in the level of the Lake. The flat shorelands surrounding the Lake are interrupted at different points by small mountain ranges set back at varying distances from the shoreline. For example, on the north side of the Lake the Promontory Mountains form a headland of about 30 miles long which juts southward in toward the center of the Lake. See Exhibit P-1. In the southeastern sector of the Lake rise the Oquirrh Mountains and the Stansbury Mountains. Several mountain clusters also exist within a few miles of the western shore of the Lake. Among these are the Lakeside Mountains and Terrace Mountains. The eastern and northwest shorelands of the Lake, however, are almost entirely dominated by salt and mud flats. See Report of Special Master Ganey, October 26, 1970, at 10-13; Exhibit P-1. The various mountain ranges form an irregular barrier to a uniform spread of the water when the Lake is on the rise. Mr. Arnow refers to differences in consequence of a change of 5 feet in the Lake elevation. For instance, at those points on the west side where the flat shorelands dominate, water could rush inland for 7½ miles, whereas such a change would cause "very little change—no change" where the mountains are.[16] (Tr. at 34.)

The movements of the water during any year, and the resulting exposure or inundation of the shorelands, are not mirrored in the annual averages. Thus, an examina-

---

[16] When the United States speaks of an average movement along the shore of a little more than 1½ inches per hour there is not reflected the fact that the Lake's movement along that part of its shoreline where mountains rise is less than where there are vast stretches of flat land where the water can rush overland almost unimpeded. Utah, however, does not discuss this inaccuracy, as it seems to the Special Master, in the United States' calculations.

tion of Exhibits P-9 and P-10[17] discloses that the elevations of the Lake on June 1 and November 1, from 1850 to 1972[18] generally ranged between one and two feet within a six-month span, exposing or inundating about 50,000 to 150,000 acres of the shallow mud flats. However, the yearly average of these movements is not their visual movements. Changes in elevation may be gradual and imperceptible but are only a part of a process the whole of which includes the effect upon the shorelands of such changes. If the effect on the shorelands is not imperceptible then the whole of the process is not imperceptible within the meaning of the doctrine of reliction.

The fluctuations at monthly intervals from 1896 to February 1, 1973, are shown on Exhibits P-11 and P-12. Changes in elevation are noted on the former. The latter translates those changes into acreage of shorelands affected. Study of these Exhibits together with Exhibits P-13 and P-14,[19] and using as illustrative the period from November 1, 1970 to June 15, 1971, shows that the rise in the level of the Lake flooded over 450,000 acres of the flat shorelands, followed by a recession for three and a half months, leaving inundated about 175,000 acres, rising again to inundate some 380,000 acres in the following seven and a half months. The Lake then receded for four and a half months, leaving inundated some 200,000 acres.

Exhibit P-16 charts the fluctuations for June, 1967. On June 6, for example, the level of the Lake rose and fell 10 times. When these actual fluctuations are averaged, however, the net change is zero. For ten days just

---

[17] The data contained in the Exhibits are based on undisputed gauge recordings.

[18] Only to June 1, 1972.

[19] Exhibits P-13 and P-14, however, are limited to monthly intervals from 1955 through February 1, 1973.

prior to June 15, 1967, the date of the quitclaim deed, the major fluctuations in elevation ranged between 3 and 6 inches, inundating or exposing between 10,000 and 20,000 acres with each fluctuation.[20]

If the actual change since statehood in the relation of the waters of the Lake to the adjoining land had been as calculated by the United States, only a little over 1½ inches per hour,[21] the position of the United States that the process has been imperceptible would be substantial, but this statement of the rate of change in the relation of the water level to acreage affected does not reflect the actual changes as they occurred. Changes in the level of the Lake are gradual. However, the imperceptibility feature of reliction is to be judged according to the actual effect on the shorelands of such a change. The unique nature of the area causes a gradual and slight change in the elevation of the Lake to result in a much greater alteration of the relation of the water to the land. This is demonstrated by the statistical data which has been charted from the records, partially analyzed above and more fully disclosed by the Exhibits which chart more fully the constant movements of the waters and the ef-

---

[20] The above are a few of many detailed records which have been graphed and charted upon Exhibits placed in the record. Similar chartings of daily and hourly fluctuations in elevation and accompanying effect on acreage are available in the Exhibits, although only some of those specifically referred to are reproduced in this Report. The Special Master does not understand that either the United States or Utah challenges the accuracy of any of the Exhibits, but only their significance on the imperceptibility issue, or, stated otherwise, only their significance on the issue of reliction. There is appended to this Report as Appendix A, calculations of the movements of the Lake by periods which have been compiled by the Special Master from the Exhibits. These calculations were approved by the parties with slight modifications.

[21] *See* p. 15, *supra*.

fect of these on the land, annually, seasonally, monthly, daily and hourly.

To place the matter thus disclosed in a light most favorable to the United States is to consider what may be referred to as the net result of the movements of the Lake over a substantial period of time. For example, in the ten years from about 1953 to 1963 (see Exhibits P-12 and D-6), the general movement, due to lowering of the elevation of the Lake, was a recession of its waters from the shorelands, accompanied, however, by rather constant fluctuations up and down, as it were, as the general recession continued. At the end of the period there was a very perceptible area which had become exposed during the period, but perhaps there had been at no particular moment a separate perceptible component of this total movement of exposure. To accept this, however, as meeting the imperceptible element of reliction, would in the view of the Special Master be an adaptation of that element of the doctrine to the unique character of the Great Salt Lake rather than to apply the imperceptible element as it has developed in the law. While there are indeed features in the over-all process and its result, thus described, which arguably favor the Court's acceptance of the imperceptible element of the doctrine, nevertheless the continued rise and fall of the elevation of the Lake on an hourly, daily and weekly basis, is unprecedented in the historical development and previous application of this element of the doctrine. This of course is due to the unique character of the area, with the erratic movements of the Lake over the land, almost constantly responding in exaggerated reflexes to slight alterations in the level of its surface.[22] The unique situ-

---

[22] The effect of the wind should also be mentioned. Mr. Arnow testified: ". . . we have a pile-up of two feet of water in the first few hours of a storm. And if the wind will persist steadily for a period of days in the same direction, the

ation resists doctrinaire classification. The perceptible net or residual change after a passage of time in the relation of the water to the land, due either to recession or progression of the water, may often be obscured as it occurs by the constant fluctuations of the water. The Special Master, however, is unable to find that the recession of the Lake to its level of June 15, 1967, occurred in a gradual and imperceptible manner.

Moreover, and importantly, even were the recession to June 15, 1967, gradual and imperceptible, the relation of the water to the shorelands at that date was not of the reasonably permanent or stable character essential, in the view of the Special Master, to application of the doctrine of reliction, a matter to be more fully discussed.

VII. THE RATIONALES OF RELICTION, IN LARGE MEASURE THOSE OF ACCRETION, ARE NOT SUPPORTED BY THE FACTS OF THE PRESENT CASE

1. It seems desirable to round out the rationales of the doctrine, with special reference to the Court's treatment of accretion in *Bonelli.* The Court summarized the reasons underlying the common law doctrine as follows:

> First, where lands are bounded by water, it may well be regarded as the expectancy of the riparian owners that they should continue to be so bounded.[21] Second, the quality of being riparian, especially to navigable water, may be the land's "most valuable feature" and is part and parcel of the ownership of the land itself. *Hughes* v. *Washington, supra,* at 293; *Yates* v. *Milwaukee,* 10 Wall. 497, 504 (1871). Riparianness also encompasses the vested right to

---

water level is pushed up ½ a foot and will stay half a foot higher for several days." (Tr. 47.) Also, "the higher the wind the higher the evaporation," and "the higher the temperature the higher the evaporation."

> future alluvion, which is an "essential attribute of the original property." *County of St. Clair* v. *Lovingston*, 23 Wall. 46, 68 (1874). By requiring that the upland owner suffer the burden of erosion and by giving him the benefit of accretions, riparianness is maintained. Finally, there is a compensation theory at work. Riparian land is at the mercy of the wanderings of the river. Since a riparian owner is subject to losing land by erosion beyond his control, he should benefit from any addition to his lands by the accretions thereto which are equally beyond his control. *Ibid.* The effect of the doctrine of accretion is to give the riparian owner a " ' "fee, determinable upon the occupancy of his soil by the river," and [to afford] the State [a title] to the river bed [which is] likewise a . . . "qualified" fee, "determinable in favor of the riparians upon the abandonment of the bed by the river." ' "[22]
>
> [21] [Omitted.]
>
> [22] 107 Ariz., at 472, 489 P.2d, at 706 (Lockwood, J., dissenting), quoting, *State* v. *R.E. Janes Gravel Co.*, 175 S.W.2d 739, 741 (Tex.Civ.App. 1943), rev'd on other grounds *sub nom. Maufrais* v. *State*, 142 Tex. 559, 180 S.W.2d 144 (1944).

414 U.S. at 326.

Reverting to the factual situation in *Bonelli*, the Court pointed out in addition that the riparian owner, "because of the navigational servitude" is at the mercy of "governmental forces which may similarly affect the riparian quality of his estate":

> Accordingly, where land cast up in the Federal Government's exercise of the servitude is not related to furthering the navigational or related public interests, the accretion doctrine should provide a disposition of the land as between the riparian owner and the State. See *Michaelson* v. *Silver Beach Assn.*, 342 Mass. 251, 173 N.E.2d 273 (1961).

414 U.S. at 329.

The navigational and related public interests of a State have required that a State retain title to and control of navigable waterways as an element of its sovereignty. This has proved historically necessary because,

> " 'Such waters . . . are incapable of ordinary and private occupation, cultivation and improvement; and their natural and primary uses are public in their nature, for highways of navigation and commerce, domestic and foreign, and for the purpose of fishing. . . .' *Shively* v. *Bowlby*, *supra*, at 11."

414 U.S. at 322.

However, once the rechannelization project was accomplished the land exposed as a consequence, formerly part of the riverbed, was "no longer . . . incapable of ordinary and private occupation . . ." and there was, as well, "no longer a public benefit to be protected; consequently, the State, as sovereign, had no need for title." 414 U.S. at 323-24. Thus, *Bonelli* supplements the traditional doctrine of accretion by requiring an appraisal of the state interests affected by the exposure, compared with the interests of the riparian owner.

2. The foregoing considerations underlying the doctrine of accretion, and, insofar as the facts of the present case permit, the doctrine of reliction, subsume, in the view of the Special Master, a reasonable permanence or stability in the change which has occurred in the relation of the water to the land. The United States in its brief before the Special Master urges that a more precise statement would be that the land formation must be "not clearly temporary." The situation in *Bonelli* created by the channeling project was "not clearly temporary." Indeed it was of a permanent character.

The generally uniform characterization of the common law doctrine of reliction and accretion has always seemed to contemplate a result substantially permanent; thus, the land "hath been formed, and hath been settled, grown and accrued," the language of *The King* v. *Lord Yarborough*, *supra*. The omission of the case law to refer uniformly to permanence is understandably due to this quality being implied as a result of the gradual and imperceptible process. The situation should be no different where the claim rests upon a process which may have been perceptible. Both accretion and reliction involve an addition to the riparian land, ordinarily by a deposit of soil in the case of accretion, by the exposure of land previously under water in the case of reliction. The factor of "addition" implies reasonable stability or permanence. The criterion of "little by little, by small and imperceptible degrees," *Jones* v. *Johnston*, *supra*, 59 U.S. at 156, had reference to "land gained from the sea," which implicitly assumes something more than a temporary condition of the "soil that had gradually been deposited." In *Sapp* v. *Frazier*, 51 La.Ann. 1718, 26 So. 378 (1899), it was said that ". . . 'reliction' is land added to a front tract by the permanent uncovering of the waters," and ". . . as used by the English law, [it] meant when the sea shrank back below the usual watermark, and remained there." 26 So. at 380. *State* v. *Longyear Holding Co.*, 224 Minn. 451, 29 N.W.2d 657 (1947) is to the same effect:

> It is also clear that before a riparian owner can claim title to lands as a result of relictions, *such reliction must be of a permanent nature*, without the possibility of the water again filling in or covering the relicted area. (Emphasis in original.)

29 N.W.2d at 667.

> Derelicted or relicted land is land added by the recession of the water leaving a portion of the bed dry.[39]
>
> [39] *Fontenelle* v. *Omaha Tribe of Nebraska*, 298 F.Supp. 855 (D.Neb. 1969), *aff'd*, 430 F.2d 143 (8th Cir. 1970).

Lundquist, *Artificial Additions to Riparian Land: Extending the Doctrine of Accretion*, 14 ARIZ.L.REV. 316, 321 (1972). And see, *Utah* v. *Hardy*, *supra*.

Though the use of "permanent" as a necessary quality of the change appears sometimes in opinions where the doctrine is not applied because the change has been so clearly temporary, as in *Flisrand* v. *Madson*, 35 S.D. 457, 152 N.W. 796, 798 (1915), and *Hillebrand* v. *Knapp*, 65 S.D. 414, 274 N.W. 821, 823 (1937), none of the decisions which omit such reference is inconsistent with the idea of permanence or stability. There is nothing in the Court's application of federal common law to the situation in *Bonelli* which indicates any departure from the non-federal common law in this respect. All references to the change in relation of the Colorado River to the shoreland indicate the result was a permanent addition to the riparian land.

3. The special facts of the present case bearing upon the question of permanence are now considered.

At the date of the quitclaim deed the elevation of the Lake was 4194.9 feet (Tr. 3), a drop of 5.3 feet in its level from January 4, 1896, the date of statehood. At that time its elevation was 4200.2 feet. See Report of Special Master Ganey, October 26, 1970, at 29. This lowering of the level of the Lake had exposed by June 15, 1967, an area of about 325,000 acres, shown on Exhibit D-2 in the dark shading. Since June 15, 1967, the level of the Lake has risen to within a few inches of its statehood level, reinundating this area which had become exposed after statehood. Thus as of February 27, 1973, the date of hearing before the Special Master, nearly all the land now in dispute had been resubmerged. See p. 9, *supra*.

This development is part of the physical situation respecting the Lake and adjoining land, demonstrated by data available to the Court and bearing upon the question to be decided. Whatever interests the United States owned June 15, 1967, and described in the deed, passed to Utah; but whether any of this land which had become exposed after statehood was then owned by the United States depends upon whether the doctrine of reliction had divested Utah of its prior ownership. That question, in the opinion of the Special Master, cannot be answered so as to divest Utah of title to the area in question unless the condition on June 15, 1967 was a reasonably permanent or stable one. This element of the doctrine is illuminated by the continuity of the Lake's history since June 15, 1967.

The importance of the post-June 15, 1967 data is that it demonstrates that the situation had not prior to or on June 15, 1967, reached a state of stability or reasonable permanence. While the Court's decree of May 22, 1972, states the basic question to be whether "prior to June 15, 1967, the claimed doctrine of reliction applies," the facts bearing upon whether the doctrine applies prior to that date include data with respect to the relation of the waters of the Lake to the land on and subsequent to June 15, 1967. This evidence discloses a continuing movement which has reinundated the area, thus reconstituting the bed of the Lake just about as it was at statehood.

It does not seem that the issue of possibly divesting Utah of title to the area should be determined by freezing the situation as it was at some moment on or prior to June 15, 1967, when it has developed that the Lake on that date was in a rising movement which, with interim up and down fluctuations, has continued to the time of the making of the record in this case. See Exhibit P-4.

The doctrines of accretion and reliction contemplate ambulation in title boundaries; but the valuable features of riparian ownership, particularly those incident to maintaining access to the water, and the compensation theory referred to in *Bonelli*, *supra*, 414 U.S. at 326, seem to the Special Master to envisage a situation different from the special relation of the waters of the Great Salt Lake to the riparian land. Such a relation seems inconsistent with the stability which should pertain to a change in title by operation of law. In providing for payment by Utah to the United States of such interests as the United States might be found to have conveyed to the State by the quitclaim deed of June 15, 1967, the statute of June 3, 1966 is indicative of a congressional assumption that such payment would be required only if the situation at that date was reasonably permanent in nature rather than temporary, as the history of the Lake has demonstrated it to have been.[23]

4. Under a dominant principle of *Bonelli* the reinundation during the period of this litigation of almost the entire statehood bed of the Great Salt Lake confirms the Special Master in his recommendation adverse to application of the relicition doctrine, because the public benefit of Utah entitled to protection has moved along with the reinundating waters of the Lake, whereas in the *Bonelli* case Arizona's public benefit to be protected faded away as the waters of the Colorado River receded from the land.

Note is taken of the *Statement of the State of Utah With Respect to Bonelli v. Arizona,* filed January 28, 1974, which refers to various interests of Utah in the disputed area as substantial. Among these is that the exercise of its navigational servitude over the Lake would be threatened by a holding that the disputed land is not part of the bed of the Lake. Reference also is made to the brines, salts and minerals in solution. These minerals are extracted by pumping water from the Lake into "settling ponds" on the salt or mud flats, where solar evaporation causes the minerals to precipitate on the bottom of the ponds. See Tr. at 33, 81.

---

[23] Should the Court hold that the doctrine of reliction has divested Utah of title to the land claimed by the United States under that doctrine, a question, not factually addressed by the parties on the present record, may arise as to the exact boundary lakeward of the relicted lands on June 15, 1967.

The doctrine of reliction does not seem to furnish a sound basis for resolution as of June 15, 1967, of the respective interests of the two sovereigns in and about this unusual body of water.

FINDINGS OF FACT [24]

1. The Great Salt Lake is a large body of water surrounded in greater part by shorelands which are so flat that a slight change in the elevation of the Lake causes the water, except where the shore is mountainous, to spread over a large area quite out of proportion to the change in elevation of the surface of the Lake if the change is a rise, and vice versa if a fall.

2. Only a relatively small part of the immediate shoreland is mountainous. See Exhibit P-1; Report of Special Master Ganey, October 26, 1970, at 10-13.

3. Streams of clear water are the chief tributary sources of the Lake, supplemented by precipitation. The Lake has no outlet. Its elevation accordingly is governed by the inflow of the streams, by precipitation, and by evaporation, the latter depending upon climate, the area

---

[24] The parties are in agreement as to the physical characteristics and history of the movements of the Lake in relation to the shorelands, represented by the statistical data and charts contained in the Exhibits. This data as set forth in the Report and, also, the testimony of Mr. Arnow and Mr. Hewitt, may therefore be considered as undisputed findings. The present Findings of Fact are limited to those basic or ultimate findings which the Special Master believes are determinative of the conclusion to be reached. They reflect in final form the interim findings and conclusions set forth in the course of his Report.

The fact that the Report in important respects is discursive of the evidence in its legal consequences, and is not confined to factual findings, the Special Master considered justified by the nature of the case.

of the surface of the Lake at different times, and the degree of salinity of the waters of the Lake.

4. As the name of the Lake implies the water is salty. The degree of salinity, which in turn affects the rate of evaporation, depends in part upon the relation of fresh water inflow and precipitation to the degree of evaporation. The latter depends largely upon the relative aridity of the climate at any particular time.

5. Man-made interferences with the rate of tributary inflow over the years has affected the elevation of the Lake. The elevation would have been 3.7 feet higher at the time of statehood and 5.28 feet higher in 1967 if it were not for the activities of man.

6. The various factors above described and their interaction one upon another cause a continuous change in the elevation of the Lake. This causes a constant fluctuation of its waters, in both a receding and inundating character with respect to the flat shorelands.

7. At some periods in the history of the Lake, of which accurate records have been kept, made available to the Court in the record compiled before the Special Master, the general trend in the relation of the waters of the Lake to the shorelands has been a recession from the line which defined the bed of the Lake at statehood, when title to the bed vested in Utah. These periods of general recession, exposing land which was part of the bed at statehood, have always been accompanied by "up and down" fluctuations which did not interrupt the general recession.

8. At other periods in the history of the Lake the opposite of the above has occurred; that is, the general direction of the movement of the waters has been to inundate or reinundate large areas of shoreland previously exposed, accompanied by similar smaller fluctuations "up and down" within the general direction of inundation or reinundation.

9. The situation described in findings 7 and 8 is illustrated by Exhibit P-4 made a part of this Report, and grows out of the variations which occur among the several factors which contribute to the movements of the waters in relation to the shorelands at different times.

10. On January 4, 1896, the date of statehood of Utah, the elevation of the Lake was 4200.2 feet. On June 15, 1967, the date of the quitclaim deed, it was 4194.9 feet, a recession of 5.3 feet. This had resulted as of June 15, 1967, in the exposure of an estimated 325,000 acres of land which was part of the bed of the Lake at statehood.

11. On June 15, 1967, as part of a process of movement of the waters of the Lake in relation to the shorelands which began in 1963, the elevation of the Lake was rising and has continued in a general rising movement to the time of the hearing before the Special Master in February, 1973, at which time nearly all the land exposed as described in Finding 10 had been reinundated so that the bed of the Lake was about as at statehood; that is, the land which at statehood had constituted the bed of the Lake was again almost entirely covered by the waters of the Lake.

12. The Lake experiences three general types of fluctuations, annual, seasonal and daily, although there are also measurable monthly and hourly changes. The annual change is the product of every physical factor affecting the level of the Lake on a yearly basis. The average of changes in the level of the Lake at regular intervals over a 12-month cycle since statehood has been about .69 feet; that is, the average annual change of the level has been about 8.28 inches, a change which, considered alone, would inundate about 50,000 acres of shoreland due to the fact that much of the shoreland is so flat that the water moves almost in a horizontal direction.

13. The shoreline of the Lake is 350 lineal miles. If the shoreline were of about equal flatness and the 50,000 acres referred to in Finding 12 were distributed equally among the lineal miles, the average movement along the shore would be about 1200 feet annually, about 3 feet per day, or a little over 1½ inches per hour. These calculations do not reflect the actual movements of the water as they occur but are based on averages calculated subsequent to the actual movements.

14. The shorelands are not of equal flatness or width of flatness, due to the mountains which are adjacent to some parts of the Lake, shown on Exhibit P-1, and other mountains which border the Lake. The movement of the waters along the lineal miles of shoreland is affected by mountains some of which, although not at the edge of the water or obtruding upward in it, border the shorelines at a distance near enough to affect the spread of the waters in a manner not reflected in the calculation described in Finding 13.

15. By reason of the conditions described in Finding 14 above the calculations reflected in Finding 13 that the average movement along the shore would be about 1200 feet annually, about three feet per day, or little more than 1½ inches per hour, are to an unascertained degree an under-estimate of the rate of movement over extensive areas of shore, a rate of movement which the Special Master cannot find on this record to be imperceptible.

16. The continuous rise and fall of the elevation of the Lake, though gradual, is reflected in a continuous movement of the waters to and fro across the shorelands, apart from the effects of the wind. These movements are often perceptible.

17. The net amount of land exposed or inundated over a substantial period of time is perceptible in comparison with the situation at the beginning of such pe-

riod, although one may not be able at any particular moment to perceive a separate component of the resulting exposure or inundation.

18. The constant fluctuations [25] of the Lake may often obscure the progress, as it occurs, of a recession or inundation which is readily perceived after the passage of time, but the Special Master is unable to find that the progress of such recession or inundation is at a rate which would be imperceptible as it occurs.

19. The land referred to as exposed at the time of the quitclaim deed, which at statehood was part of the bed of the Lake, was not an addition of a reasonably permanent or stable character to the uplands, title to which is in the United States. The land in question has been almost entirely reinundated by a spreading of the waters of the Lake by a movement which began in 1963, was in progress at the date of the quitclaim deed, and continued to the time of the hearing in this case before the Special Master in February, 1973.

Conclusions of Law

1. The question considered is to be decided under the federal common law doctrine of reliction.

2. Whether under that doctrine any interests were owned by the United States in the lands lying between the outer edge of the bed of the Lake at statehood and its bed underwater on June 15, 1967, which passed to the State of Utah by the quitclaim deed of the United States of June 15, 1967, depends upon whether the exposure of the land referred to, either by a perceptible or a gradual and imperceptible process, constituted a reasonably permanent or stable addition to the riparian land which was up-

---

[25] The use of "fluctuations" in this finding does not exclude the effect of the wind.

land from the bed of the Lake at statehood, title to which was in the United States.

3. The exposure of the lands referred to occurred in the course of such unique changes in the relation of the waters of the Lake to the shorelands as not to come within the doctrine of reliction. These changes were not at the date of the quitclaim deed of such a reasonably permanent or stable character as to warrant application of the doctrine.

4. The public benefit of Utah which is entitled to protection has accompanied the reinundation of the bed of the Lake to approximately its extent at statehood.

5. The law of reliction has not divested the State of Utah of title to the lands described.

6. The State of Utah is entitled to a decree quieting its title as against the United States to the bed of Great Salt Lake at the date of statehood.

7. The State of Utah is not required to pay the United States for the land covered by Great Salt Lake and below the boundary line of the Lake's bed as of January 4, 1896.

8. The United States is the riparian owner which would be entitled to the benefit of the doctrine of reliction were it applicable to the land the title to which is the subject matter of this Report. The Lake, its bed, and the adjoining land were ceded by Mexico to the United States in 1848 under the Treaty of Guadaloupe Hidalgo, 9 Stat. 922. See Report of Judge Ganey, October 26, 1970, p. 9.

PROPOSED DECREE

It is ordered, adjudged and decreed that:

1. The United States of America, its departments and agencies, are enjoined, subject to any regulations which the Congress may impose in the interest of navigation

or pollution control, from asserting against the State of Utah any claim of right, title and interest:

(a) to any of the exposed shorelands situated between the edge of the waters of the Great Salt Lake on June 15, 1967, and the bed of the Lake on January 4, 1896, when Utah became a State, with the exception of any lands within the Bear River Migratory Bird Refuge and the Weber Basin federal reclamation project;

(b) to the natural resources and living organisms in or beneath any of the exposed shorelands of the Great Salt Lake delineated in (a) above; and

(c) to the natural resources and living organisms either within the waters of the Great Salt Lake, or extracted therefrom, as delineated in (a) above.

2. The State of Utah is not required to pay the United States, through the Secretary of the Interior, for the exposed shorelands, including any minerals, delineated in paragraph 1 above of this decree.

3. There remains the question whether any lands within the meander line of the Great Salt Lake (as duly surveyed prior to or in accordance with section 1 of the Act of June 3, 1966, 80 Stat. 192), and conveyed by quitclaim deed to the State of Utah, included any federally owned uplands above the bed of the Lake on the date of statehood (January 4, 1896) which the United States still owned prior to the conveyance to Utah.[1] In the absence of agreement between the parties disposing of the above question or of the necessity for further proceedings with respect thereto, the Special Master is directed to hold such hearings, take such evidence, and

---

[1] As appears from p. 4 of the Special Master's Report the parties have reserved their position with respect to this question.

conduct such proceedings with respect to that question as he deems appropriate and, in due course, to report his recommendations to the Court.

4. The prayer of the United States of America in its answer to the State of Utah's Complaint that this Court "confirm, declare and establish that the United States is the owner of all right, title and interest in all of the lands described in Section 2 of the Act of June 3, 1966, 80 Stat. 192, as amended by the Act of August 23, 1966, 80 Stat. 349, and that the State of Utah is without any right, title or interest in such lands, save for the right to have these lands conveyed to it by the United States, and to pay for them, in accordance with the provisions of the Act of June 3, 1966, as amended," is denied.

Respectfully submitted,

CHARLES FAHY,
Senior Circuit Judge,
Special Master.

APPENDIX A

Statistical Data as to Rise and Fall of Elevation of Lake by Periods, with Effect on Bordering Land.

1. 1873-1906

At the time of Utah's statehood, the Lake was in a period of general decline which had begun in 1873. In 1873 the Lake's average level was 4211.20 feet and in 1896 it had fallen to an average level of 4201.10 feet. It continued to fall until in 1906 it reached an elevation of an annual average of 4196.83 feet. Thus from 1873 to 1906, the Lake's elevation declined approximately 14.37 feet, and from 1896 to 1906, 4.27 feet. [Exhibits D-3 and D-6.]

The surface area of the Lake receded from an approximate average annual area of 1,554,000 acres in 1873 to approximately 1,120,000 in 1896 and 835,700 acres in 1906, with a recession between 1873 and 1906 of 718,300 acres of land and from 1896 to 1906 of 284,300 acres of land. [Exhibits D-3 and P-5.]

2. 1906-1910

From 1906 to 1910 the Lake rose 6.10 feet, from its average annual elevation of 4196.83 feet to 4202.93 feet, and increased its surface area by approximately 371,800 acres, from 835,700 acres to 1,207,500 acres. [Exhibits D-3 and P-5.]

3. 1910-1920

From 1910 to 1920 the Lake declined 1.71 feet in elevation, from an average elevation of 4202.93 feet to 4201.22 feet, and receding 81,700 acres, from a surface area of 1,207,500 acres to 1,125,800 acres. [Exhibits D-3 and P-5.]

4. *1920-1924*

From 1920 to 1924 the Lake rose 3.09 feet in elevation from an average of 4201.22 feet to 4204.31 feet, and its surface area increased by 143,700 acres from 1,125,800 acres to 1,269,500 acres. [Exhibits D-3 and P-5.]

5. *1924-1936*

From 1924 to 1936 the Lake declined 9.54 feet in elevation from an average of 4204.31 feet to 4194.77 feet, and its surface area decreased 566,700 acres, from 1,269,500 acres to 702,800 acres. [Exhibits D-3 and P-5.]

6. *1936-1953*

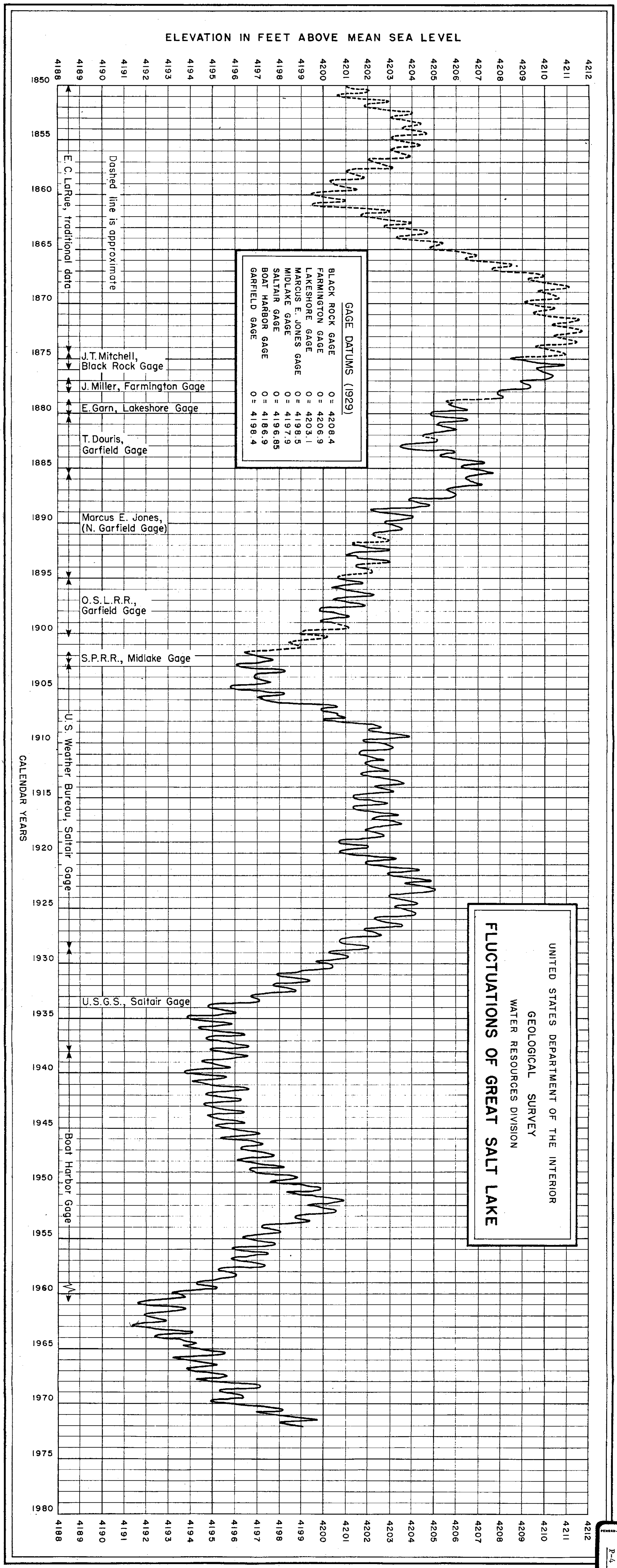
From 1936 to 1953 the Lake rose 5.17 feet in elevation, from an average of 4194.77 feet to 4199.94 feet, and its surface area increased 355,600 acres from 702,800 acres to 1,058,400 acres. [Exhibits D-3 and P-5.]

7. *1953-1963*

From 1953 to 1963 the Lake declined 7.2 feet in elevation from an average of 4199.94 feet to 4192.22 feet, and its surface area decreased 438,800 acres from 1,058,400 acres to 619,600 acres. [Exhibits D-3 and P-5.]

8. *1963-1973 Hearing*

From 1963 to the 1973 Hearing the Lake has been generally rising. In 1963 the elevation of the Lake was 4192.22 feet, the average level. In 1967, the average elevation of the Lake was 4194.01 feet, an increase of 1.79 feet. By 1967 the Lake's surface area had increased 52,800 acres from an average of 619,600 acres to 672,400 acres. If the Lake has reached 4200 feet, it would have risen 7.78 feet since 1963 and its surface area would have increased 442,400 acres to 1,062,000 acres. [Exhibits D-3 and P-5.]



UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

FLUCTUATIONS OF GREAT SALT LAKE

GAGE DATUMS (1929)

BLACK ROCK GAGE	0= 4208.4
FARMINGTON GAGE	0= 4206.9
LAKESHORE GAGE	0= 4203.1
MARCUS E. JONES GAGE	0= 4198.5
MIDLAKE GAGE	0= 4197.9
SALTAIR GAGE	0= 4196.85
BOAT HARBOR GAGE	0= 4186.9
GARFIELD GAGE	0= 4198.4

PENGAD-Bayonne,
EXHIBIT
P-4

9-210-C
(Rev. 5-63)

UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY (WATER RESOURCES DIVISION)

PENGAD-Bayonne
EXHIBIT
P-5

Rating table for Great Salt Lake: Surface Area vs Stage Dated ...., 19....
St

from AREA x 1000 to ....; from .... to ....

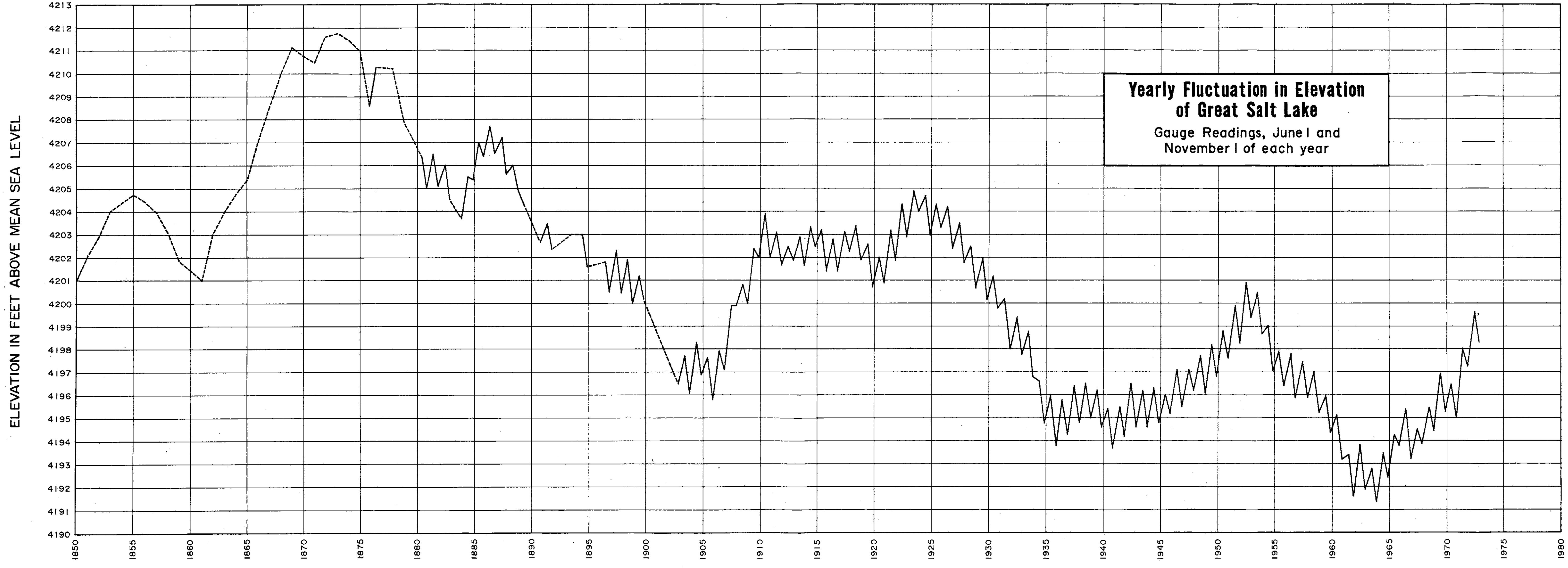
from .... to ....; from .... to ....

tenths

Gage height	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09	Difference
Feet	Cfs	Cfs	Cfs	Cfs	Cfs	Cfs	Cfs	Cfs	Cfs	Cfs	Cfs
4191.	592	574	596	599	601	603	605	607	610	612	22
4192.	614	617	619	622	624	627	630	632	635	637	26
4193.	640	643	646	650	653	656	659	662	666	669	32
4194.	672	676	680	684	688	692	696	700	704	708	40
4195.	712	717	723	728	734	739	744	750	755	761	54
4196.	766	774	783	791	800	808	816	825	833	842	84
4197	850	858	866	874	882	890	898	906	914	922	80
4198.	930	937	944	952	959	966	973	980	988	995	72
4199	1,002	1,008	1,014	1,020	1,026	1,032	1,038	1,044	1,050	1,056	60
4200	1,062	1,067	1,073	1,078	1,083	1,088	1,094	1,099	1,104	1,110	53
4201.	1,115	1,120	1,125	1,129	1,134	1,139	1,144	1,149	1,153	1,158	48
4202.	1,163	1,168	1,173	1,177	1,182	1,187	1,192	1,197	1,201	1,206	48
4203.	1,211	1,215	1,220	1,224	1,229	1,233	1,237	1,242	1,246	1,251	44
4204	1,255	1,260	1,264	1,269	1,274	1,278	1,283	1,288	1,293	1,298	47
4205	1,302	1,306	1,310	1,314	1,318	1,322	1,325	1,329	1,333	1,337	39
4206	1,341	1,345	1,349	1,354	1,358	1,362	1,366	1,370	1,375	1,379	42
4207	1,383	1,387	1,391	1,395	1,399	1,403	1,407	1,411	1,415	1,419	40
4208	1,423	1,427	1,432	1,436	1,440	1,444	1,449	1,453	1,457	1,462	43
4209	1,466	1,470	1,474	1,478	1,482	1,486	1,489	1,493	1,497	1,501	39
4210	1,505	1,509	1,513	1,517	1,521	1,526	1,530	1,534	1,538	1,542	41
4211.	1,546	1,550	1,554	1,558	1,562	1,566	1,570	1,574	1,578	1,582	40
4212	1,586	1,590	1,594	1,598	1,602	1,606	1,609	1,613	1,617	1,621	39
4213.	1,625	1,629	1,633	1,637	1,641	1,645	1,649	1,653	1,657	1,661	40
4214.	1665										

Computed by R.J.M. 12/16/1968; Checked by G.L.W. 12/16/1968 Remarks ....

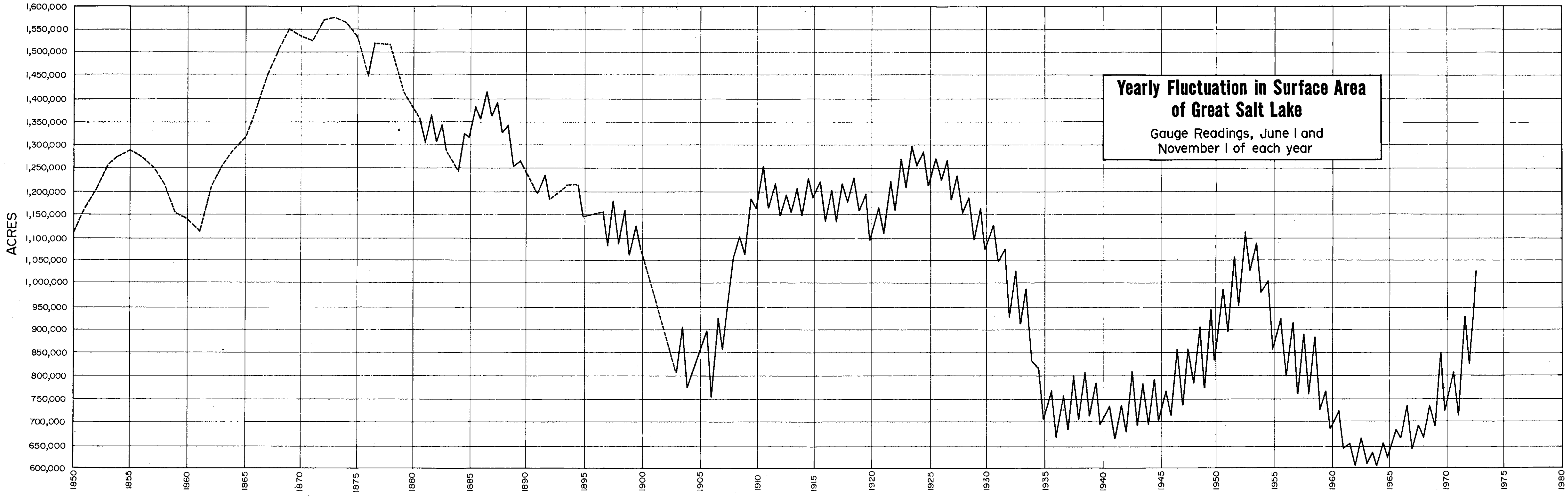
EXHIBIT
P-9



Yearly Fluctuation in Elevation of Great Salt Lake

Gauge Readings, June 1 and November 1 of each year

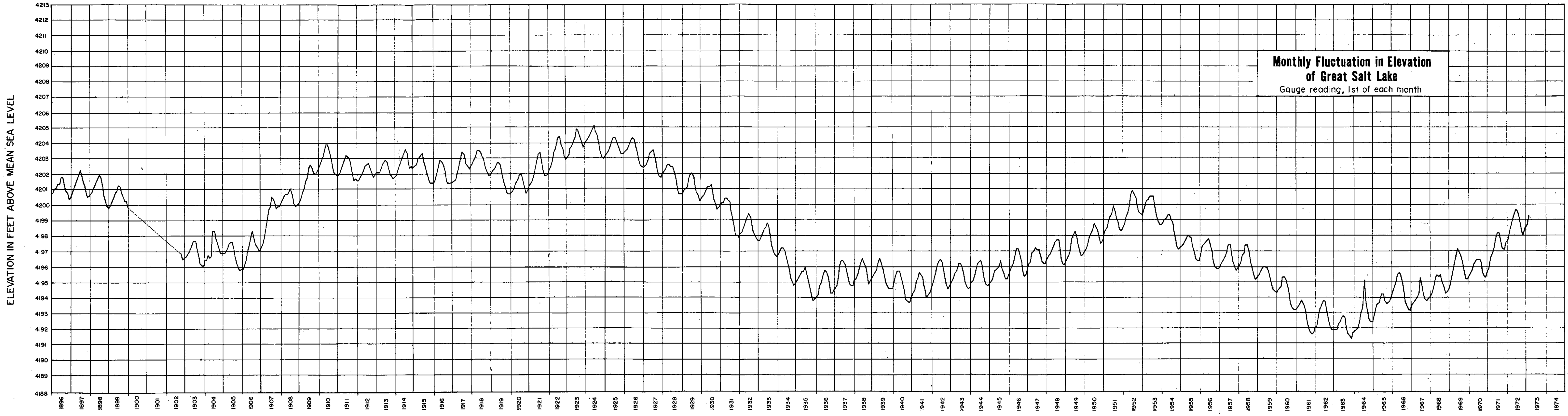
EXHIBIT
P-10



Yearly Fluctuation in Surface Area of Great Salt Lake

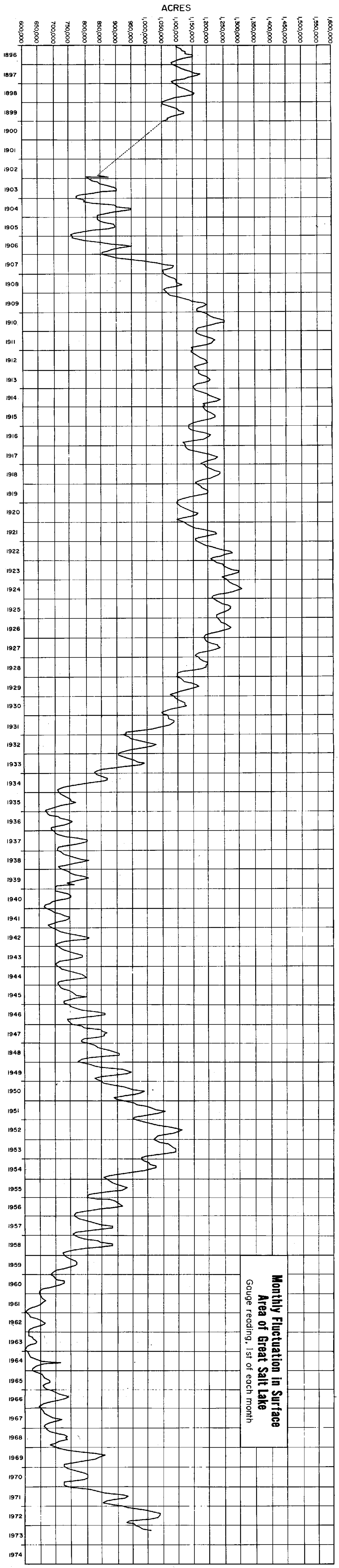
Gauge Readings, June 1 and November 1 of each year

EXHIBIT
P-11



Monthly Fluctuation in Elevation of Great Salt Lake

Gauge reading, 1st of each month


Monthly Fluctuation in Surface Area of Great Salt Lake

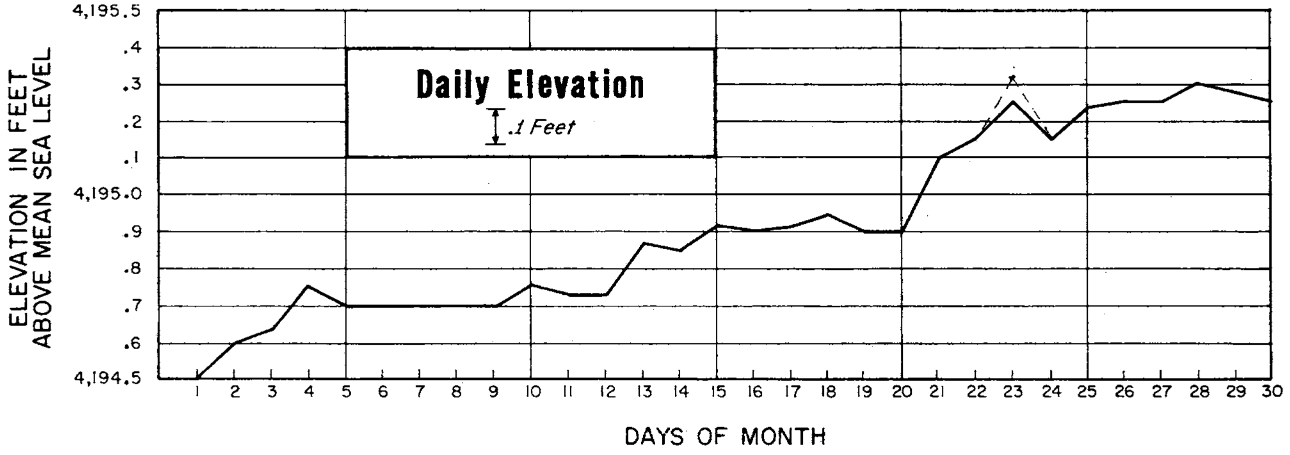
Gauge reading, 1st of each month

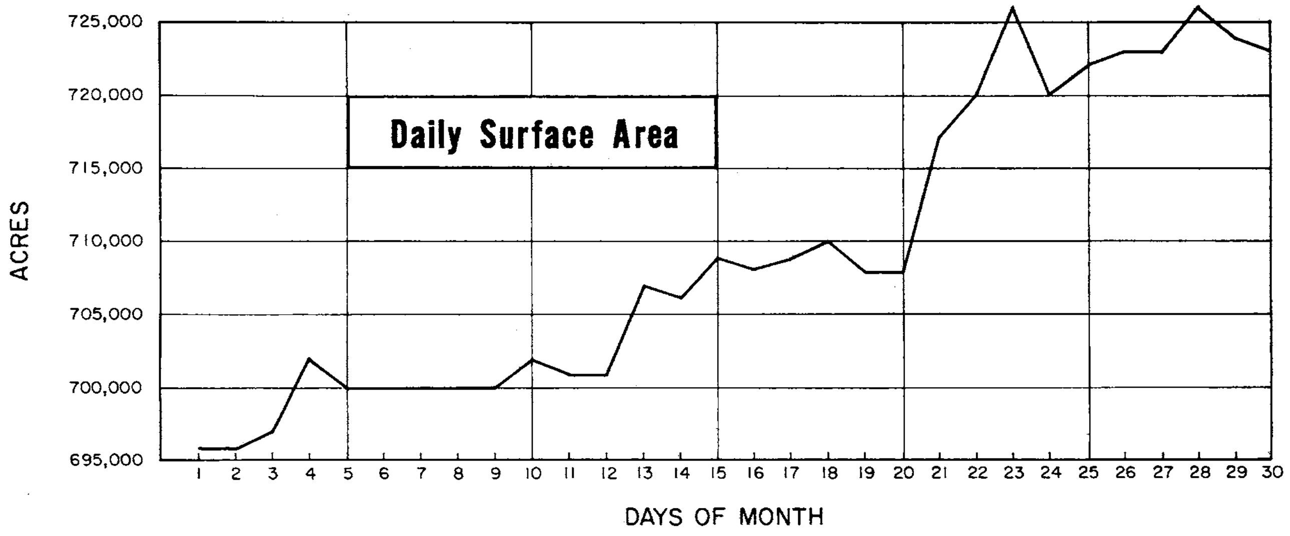
EXHIBIT
P-12

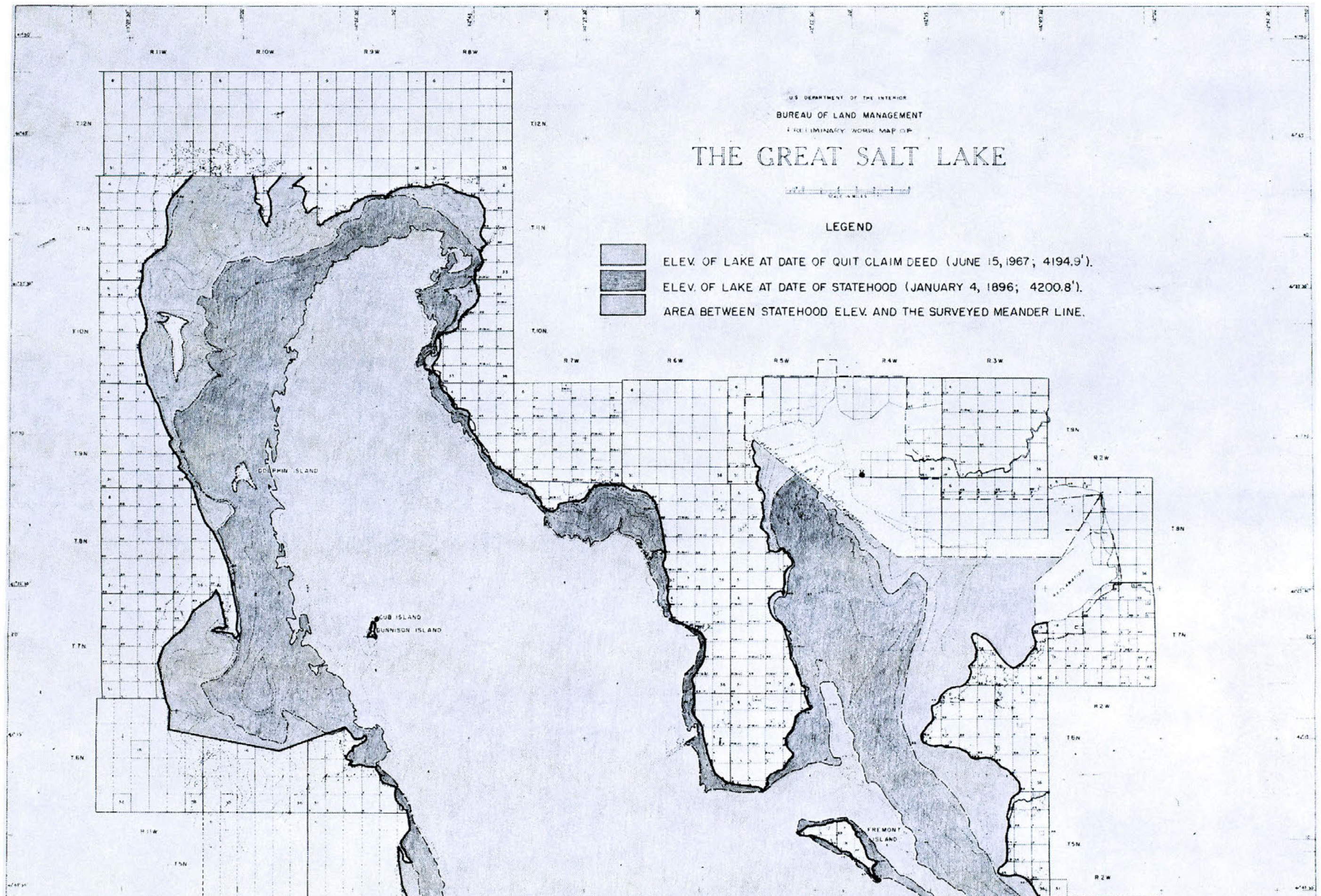
EXHIBIT

P-17

Daily Fluctuation in Elevation and Surface Area of Great Salt Lake for the Month of June 1967







DEFENDANT'S EXHIBIT
No. 2

ANNUAL CHANGE IN ALTITUDE OF GREAT SALT LAKE, UTAH

Year	Average altitude (feet above msl)	Annual change (feet)
1851	4201.35	
1852	4202.10	0.75
1853	4203.25	1.15
1854	4203.80	.55
1855	4203.70	-.10
1856	4203.60	-.10
1857	4203.10	-.50
1858	4202.15	-.95
1859	4201.15	-1.00
1860	4200.50	-.65
1861	4200.25	-.25
1862	4202.00	1.75
1863	4203.00	1.00
1864	4204.00	1.00
1865	4204.90	.90
1866	4206.40	1.50
1867	4207.90	1.50
1868	4209.60	1.70
1869	4210.45	.85
1870	4209.90	-.55
1871	4210.00	.10
1872	4211.00	1.00
1873	4211.20	.20
1874	4210.60	-.60
1875	4210.15	-.45
1876	4209.80	-.35
1877	4210.00	.20
1878	4208.80	-1.20
1879	4207.20	-1.60
1880	4205.70	-1.50
1881	4205.65	-.05
1882	4205.40	-.25
1883	4204.65	-.75
1884	4204.80	.15
1885	4206.45	1.65
1886	4207.00	0.55
1887	4206.40	-.60
1888	4205.20	-1.20
1889	4203.60	-1.60
1890	4203.40	-.20
1891	4203.10	-.30
1892	4202.25	-.85
1893	4202.00	-.25
1894	4202.30	.30
1895	4201.65	-.65
1896	4201.10	-.55
1897	4201.45	.35
1898	4201.10	-.35
1899	4200.65	-.45
1900	4200.20	-.45
1901	4199.40	-.80
1902	4197.60	-1.80
1903	4197.00	-.60
1904	4197.10	.10
1905	4197.10	0
1906	4196.83	-.27
1907	4198.69	1.86
1908	4200.38	1.69
1909	4201.24	.86
1910	4202.93	1.69
1911	4202.50	-.43
1912	4202.06	-.44
1913	4202.32	.26
1914	4202.59	.27
1915	4202.66	.07
1916	4202.00	-.66
1917	4202.21	.21
1918	4202.89	.68
1919	4202.13	-.76
1920	4201.22	-.91

DEFENDANT'S EXHIBIT
No. 3

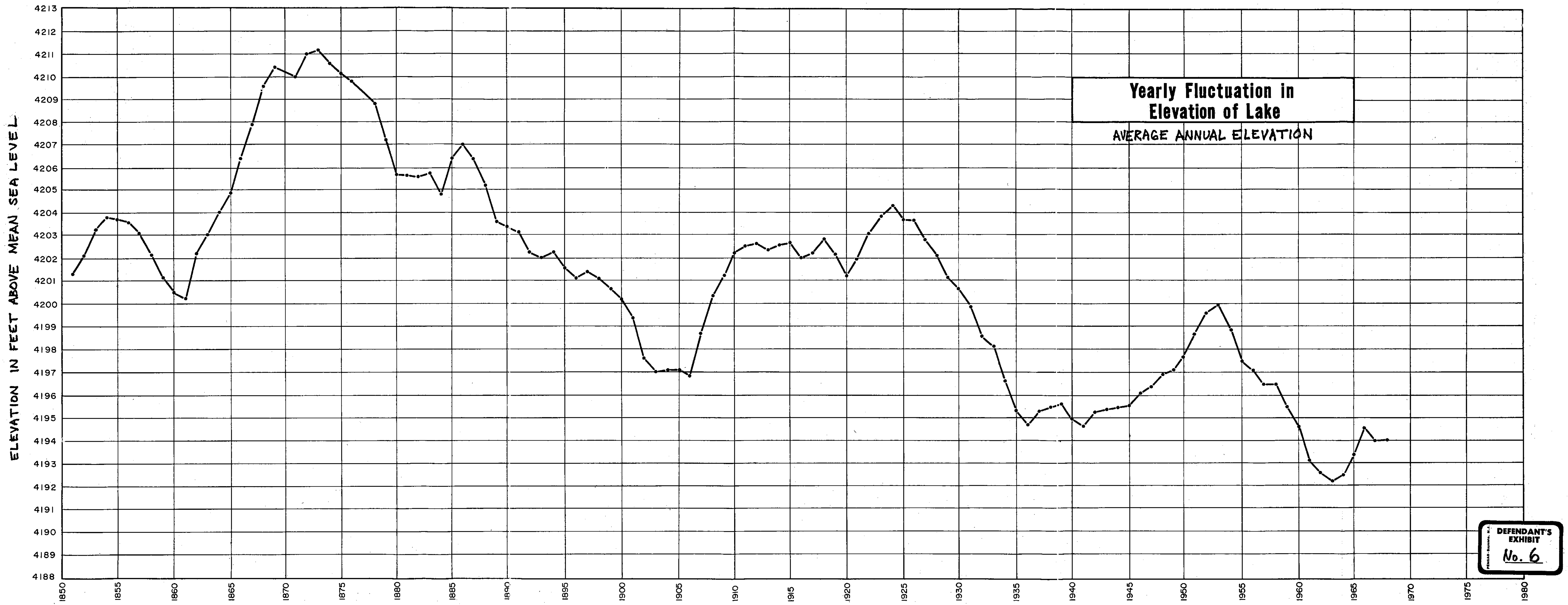
ANNUAL CHANGE IN ALTITUDE OF GREAT SALT LAKE--continued

Year	Average altitude (feet above msl)	Annual change (feet)	Year	Average altitude (feet above msl)	Annual change (feet)
1921	4201.98	0.76	1945	4195.51	0.01
1922	4203.05	1.07	1946	4196.16	.65
1923	4203.88	.83	1947	4196.49	.33
1924	4204.31	.43	1948	4196.97	.48
1925	4203.66	-.65	1949	4197.12	.15
1926	4203.64	-.02	1950	4197.75	.63
1927	4202.80	-.84	1951	4198.74	.99
1928	4202.05	-.75	1952	4199.62	.88
1929	4201.19	-.86	1953	4199.94	.32
1930	4200.67	-.52	1954	4198.83	-1.11
1931	4199.88	-.79	1955	4197.50	-1.33
1932	4198.55	-1.33	1956	4197.09	-.41
1933	4198.10	-.45	1957	4196.55	-.54
1934	4196.66	-1.44	1958	4196.50	-.05
1935	4195.30	-1.36	1959	4195.58	-.92
1936	4194.77	-.53	1960	4194.63	-.95
1937	4195.36	.59	1961	4193.19	-1.44
1938	4195.56	.20	1962	4192.68	-.51
1939	4195.64	.08	1963	4192.22	-.46
1940	4194.95	-.69	1964	4192.50	.28
1941	4194.68	-.27	1965	4193.42	.92
1942	4195.34	.66	1966	4194.62	1.20
1943	4195.44	.10	1967	4194.01	-.61
1944	4195.50	.06			

For the period 1851-1967:

Average annual change = 0.69 feet
Average monthly change = 0.06 feet

Prepared by the U.S. Geological Survey under the
direction of T. Arnow, District Chief,
Water Resources Division, Utah
January 16, 1973



Yearly Fluctuation in Elevation of Lake

AVERAGE ANNUAL ELEVATION

DEFENDANT'S EXHIBIT No. 6