It is proposed to call to the attention of the Committee, several matters which apply to the proposal to authorize and construct the Colorado River Storage Project. These are:

1. The reasons why the people of the Upper Basin of Colorado river strongly desire and greatly need the Colorado River Storage Project;

2. The proposal of the City & County of Denver that there be included in the authorization of this project a diversion from Colorado river basin, for the use and benefit of the city, of the water of Blue river at Dillon, this project to be financed by a grant of funds from the United States, bearing no interest;

3. The opposition of Wildlife bodies to the erection in Dinosaur National Monument of the Echo Park reservoir, a very essential element in the plans for the Storage Project, and the reasons why such opposition is ill-advised and not in the public interest.

NEED FOR THE STORAGE PROJECT

The first interstate compact dealing with the water of a Western river, was the Colorado River Compact of 1922. Its purpose was to allot the use of the water of Colorado river to the basin states, if possible, but when that proved impracticable, an allotment was made between two arbitrary divisions of the drainage area called the Upper and Lower Basins. The Upper Basin principally in Colorado, New Mexico, Utah and Wyoming was all the area draining into the river above a point called Lee Ferry, near where Colorado river crosses the Arizona-Utah boundary, one mile above the mouth of a tributary called Paria river, from which area not less than 86 per cent of the total flow of the river is furnished; the Lower Basin, principally within Arizona, California and Nevada is all area draining into the river below Lee Ferry. By a Compact negotiated and signed in 1948 between the Upper Basin States, an actual allocation of water to each of them was made. Several applicable provisions of the 1922 Compact will now be cited as bearing on the need for, and the purpose of, the Colorado River Storage Project.

COMPACT PROVISIONS

In Article IX the 1922 Compact ostensibly allots to both Upper and Lower Basins beneficial consumptive use of 7,500,000 acre-feet of water each, annually, in perpetuity. The effect of this allotment is, however, illusory as to the Upper Basin for Article IX provides that "The States of the Upper Division (Colorado, New Mexico, Utah and Wyoming) will not cause the flow of Colorado river to be depleted below an aggregate of 75,000,000 acre-feet for any period of ten consecutive years reckoned in continuing progressive series beginning with the first day of October next succeeding the ratification of this Compact." This is a firm guarantee to deliver to the Lower Basin an average of 7,500,000 acre-feet a year, even though it is drawn in terms meant to take advantage of high flows in every succeeding ten year period, with the hope that it would not penalize the Upper Basin nor restrict its use of water. The explanation that follows will show how significantly it fails to safeguard Upper Basin use of water, because of variations in flow of the river which could not have been reasonably foreseen.
STATEMENT

Just how the provision of Article III (d) squares with the directive in Article III (e) that, "The States of the Upper Division shall not withhold water, and the States of the Lower Division shall not require the delivery of water that cannot reasonably be applied to domestic and agricultural uses," has never been seriously studied in either basin, particularly the Lower one, where, in all the years since the Compact was ratified (because neither basin was consuming much of its allotment) use for generating electricity (which according to Article IV (b) of the Compact cannot acquire a priority of right to use), has been made of large surpluses of water not necessarily deliverable to the Lower Basin under the terms of Article III (e). The Lower Basin has had a pressing need for the electricity produced by this surplus water and has come to regard such surplus as its accustomed due.

A word about the general properties of Colorado River basin may not be amiss at this point. In its drainage area of 243,000 square miles it embraces one-eighth of the whole, and much the driest, area of the United States. Unfortunately it has much less than one-eighth of the total water supply in the United States and the flow of Columbia, Missouri, Mississippi, Ohio and many other regional rivers exceed its total outflow many times. Colorado River has less than enough water for the needs that even now are foreseen for it. The people of the whole basin must therefore, practise the most rigid economy in their use of its water if practicable and nationally necessary needs for the use of that water cannot be developed because of lack of it.

RECORD OF LEE FERRY FLOW

In the light of the foregoing Compact provisions and the great need for water the exact flow of the river at Lee Ferry for a long recent period should be set out. This will also be useful in assessing the effect of the guarantee of flow to the Lower Basin on uses in the Upper Basin, particularly if a series of years of sub-normal flow should occur, as in the last 24 years it certainly has!

TOTAL ANNUAL FLOW—COLORADO RIVER AT LEE FERRY (Compact Point)

<table>
<thead>
<tr>
<th>Year Stream Flow</th>
<th>Year Stream Flow</th>
<th>Year Stream Flow</th>
<th>Year Stream Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 = 19,334.8</td>
<td>24 = 12,481.1a</td>
<td>34 = 4,396.4a</td>
<td>44 = 13,221.4a</td>
</tr>
<tr>
<td>1915 = 12,500.4a</td>
<td>1925 = 11,341.1a</td>
<td>1935 = 9,912.1a</td>
<td>1945 = 11,545.4a</td>
</tr>
<tr>
<td>16 = 17,324.8</td>
<td>26 = 14,008.5</td>
<td>36 = 11,970.3a</td>
<td>46 =  8,744.8a</td>
</tr>
<tr>
<td>17 = 21,893.1</td>
<td>27 = 16,586.9</td>
<td>37 = 11,896.9a</td>
<td>47 = 13,514.5a</td>
</tr>
<tr>
<td>18 = 13,469.6a</td>
<td>28 = 15,323.3</td>
<td>38 = 15,440.0</td>
<td>48 = 13,687.3a</td>
</tr>
<tr>
<td>19 = 10,858.4a</td>
<td>29 = 19,223.4</td>
<td>39 =  9,393.7a</td>
<td>49 =  9,359.1</td>
</tr>
<tr>
<td>1920 = 19,738.7</td>
<td>1930 = 13,070.1a</td>
<td>1940 =  7,081.6a</td>
<td>1950 = 11,057.2a</td>
</tr>
<tr>
<td>21 = 20,714.8</td>
<td>31 =  6,738.5a</td>
<td>41 = 16,025.0</td>
<td>51 =  9,830.6a</td>
</tr>
<tr>
<td>22 = 16,302.4</td>
<td>32 = 15,286.3</td>
<td>42 = 17,029.4</td>
<td>52 = 17,975.5</td>
</tr>
<tr>
<td>23 = 16,261.3</td>
<td>33 =  9,745.4a</td>
<td>43 = 11,363.0</td>
<td>53 =  8,825.0a</td>
</tr>
</tbody>
</table>

Averages: 1914-30 = 15,918.4; 1914-53 = 13,480.7; 1931-53 = 11,678.9

a = Single years or sequences of years when flow at Lee Ferry is not sufficient to supply the Upper Basin 7,500,000 acre-feet of consumptive use, without storage in the Upper Basin, after consumptive use in both Basins reaches the maximum.
CONCLUSIONS FROM LEE FERRY FLOW

Even a casual inspection of the sequence of annual flows at Lee Ferry shows several significant conditions. The yield of the river naturally divides itself into two very different periods. The first, ending actually in 1929, but for convenience taken as ending in 1930, is that of highest flow in all the record of the river. During this period, which included the time when the Colorado River Compact was drafted, Lower River deliveries could easily have been made, with a surplus in all years except five out of sixteen, which surplus would have, however, been wiped out in 1931, a year of exceedingly low flow.

At no time after 1930 could Article III (d) have been complied with, unless storage of large capacity had been built in the Upper Basin and had been reasonably well filled. The flow of Colorado river, as the table shows is very erratic, ranging from 137.5 per cent of average in the highest year to 29.5 per cent in the lowest year. Also the table shows that in the later period, from 1931 to 1953 flow of the river has been only 74 per cent of that in the former and higher period. During the former period in only five years out of 16 was there a deficiency, while in the later period in only six years out of 24 was there a sufficiency of water for the allotted use of both Basins.

This later period of sub-normal flow has lasted 24 years and current evidence is that it will be at least 25 years, the present outlook being for a very dry year in 1954. It is thus longer than a period of drought said to have extended from 1276 to 1299 A.D., as is evidenced by a band of narrow tree rings for that whole period found in old trees in every part of the Colorado river basin. How much longer it will last the science of meteorology cannot foretell. If, or when, several years of increased flow in steady sequence have occurred, it might be said that low flows have ended, but there will be, even then, no means of knowing that such low flows will not recur.

Actual delivery to the Lower Basin at Lee Ferry has not yet been less than that contemplated by Article III (d), but only because the Upper Basin is consuming only about 25 per cent of its maximum allotment. The completion of any large project in the Upper Basin, particularly a large trans-basin diversion project, will probably reduce delivery to the Lower Basin below that required and further necessary delivery can only then be made by curtailing what is already an inadequate supply, at certain seasons of the year, in the Upper Basin.

REMEDY FOR ANTICIPATED DEFICIENCY

The foregoing conditions are those that have led to the strong desire of Upper Basin people to get started with the Colorado River Storage Project, and have some stored water in hand to meet emergencies when they arise, as seems inevitable. The project will consist of a series of large reservoirs in which surplus water from years of high flow can be retained for delivery in years of low flow, with attendant power plants, the revenue from which will pay for the whole enterprise. While there are local conditions which color the views of people in some parts of the Upper Basin all are in accord in wanting the Storage Project in its main features, as quickly as it can be begun.

On a chart inserted opposite this page are shown graphically the conditions described above. At the bottom of the chart is shown the 7,500,000 acre-feet of water annually owing the Lower Basin in a cross-hatched band extending across the drawing. Next above is the water, ostensibly equal in amount, supposed to be usable in the Upper Basin.
The water to be apportioned between the Basins is not the historical or measured flow, shown in the previous table, but a hypothetical quantity called the virgin or undepleted flow, being the amount of water in the river if no human use were made of it. Plotted above these two bands, but extending down even into the lower band in one year, and into the upper band in many years, is shown the virgin flow with its wide variations, derived by adding to the actual or historical flow the best estimate of water consumed by human use in the Upper Basin in each of the years shown.

It seems obvious from the situation shown on this chart that if the Upper Basin is to enjoy the uses of even the average flow shown there, it will be necessary to have much usable storage in the Upper Basin to overcome the effect of the years when outflow is 10,000,000 acre-feet or less. With such storage a reduced use in the Upper Basin, probably somewhat less than is shown in the note to the right of the Upper Basin allotment, is possible. Recent studies indicate that the Upper Basin might use as much as 6,100,000 acre-feet minus what ever evaporation loss from storage might occur. It is thus apparent the Storage Project is vitally needed although perhaps its first effect will not provide 7,500,000 acre-feet but will make firm a somewhat lesser supply, until or unless a succession of high flows makes more storage available.

The smaller cross-hatched area in the upper portion of the Upper Basin allotment is the deficit this Basin would suffer during the period 1930 to 1953, if there were some storage in hand and filled in the Upper Basin, with no such storage the deficit would be much increased in the years of lowest flow because it merely shows the average value without allowance for obvious operating difficulties.

Studies of the anticipated power revenues, given in detail in the project report, indicate that this project will fully repay the United States its entire cost, within 50 years after the last power unit is installed and, in fact, accumulate a surplus which might most properly be spent in aiding water users on irrigation projects in the same locality, who are unable to pay the full cost of their project works. Such subsidies will become more and more necessary in the West, where, after one hundred years of settlement very few projects can be found that can be built for a cost cheap enough to be fully repaid by the water users on the projects. But the production of food and fibre which these projects will assure, is only a wise provision for the time, not far distant, where there will be a vital need for all such products the United States can produce.

DEMANDS OF DENVER

As a very late comer, the City & County of Denver now demands that there be included in this project bill an authorization of a diversion project by which water from Colorado river basin, in Blue river at Dillon, shall be authorized to be built by the City itself, with Federal funds to be repaid by the City without interest.

The municipal water system of the City & County of Denver is administered by a board of five members who after their appointment by the Mayor of the City are an autonomous body whose only connection with the City is the necessity of the use of the City's credit for expenditures exceeding the net revenue of the water system, which revenue is entirely at the disposal of the Board of Water Commissioners. They also, without a check of any kind fix the policy of enlargement of the system and have been carrying out such policy within the amount of net revenue at their disposal.
The occasion for this hasty move is the fear that within a few years the City will have exhausted its present supply of water. In fairness is must be said that if this supposition is correct, its cause must be laid at the door of the Water Board. Such a crisis did develop in 1934-36, and was cured by a hasty building of Denver's first diversion from Fraser river, through the Moffat tunnel, with FWA funds, which included grants of considerable amounts. Scrup policy would then have dictated that this new source of water supply should be exploited in a sane and conservative manner—but this was not so done.

With the cheapest installation possible, which included only 10,000 acre-feet of storage, Moffat tunnel water was brought into the City. As the collection system was expanded, there has been during the last 17 years an average of about 40,000 acre-feet capable of diversion, but the City has realized an average of only 29,050 acre-feet, or only 71 per cent of the usable water, largely because the system had not sufficient storage.

The necessity for storage seems so obvious it is difficult to see how it can be neglected; over 70 per cent of the annually usable water of any natural stream in the Rocky Mountain region will be delivered in six to ten weeks in May, June and July. The use of the water by the City must of necessity be spread over a period several times as long, and eventually over the whole year. Obviously, therefore, there is much divertible water that cannot be utilized if the City has no place to store it. So far as Western Colorado is concerned this water, not diverted, is a total waste, for in some years the City diverts all that is usable and in other years as little as 25 per cent of the usable water; no enterprise in Western Colorado can be set up on such a supply as Denver may not see fit to, or is unable to, divert, store and use.

Until very recently Moffat tunnel water seemed to be an adequate supply, but now the lack of storage, which good policy dictates, is making itself apparent, and while the City is now belatedly trying to remedy this by building a 42,000 acre-foot reservoir on South Boulder creek, that is still poor policy, for this reservoir, to perform the needed function, should be at least three times the size being built.

It is felt that the demand by Denver for sources of water that will be enough, if properly used and conserved by adequate storage for a city three times its present size, or 1,500,000 people, is simply an attempt to perpetuate the niggardly policy of trying to utilize flowing water instead of providing sufficient storage. This accusation has been leveled against the Water Board, which they vehemently disclaim, but their actual performance is quite sufficient warrant for saying that while it may not be their deliberate intent to make wasteful use of water by depending solely on flowing supplies, their course of action has the same result and what they now propose is set up in the same wasteful manner. If Denver is going to rely solely on direct flow supplies and neglect storage, there is not enough water in Western Colorado within divertible distance to supply even the population it may have within the next ten years. In addition such a course is filled with grave danger—any time several years of low flow occur on both sides of the mountain Denver will be without water, which could only be supplied for such a contingency by large and adequate storage kept well filled. At present Denver has of such hold-over storage less than 200,000 acre-feet and to be safe should have not less than 600,000 acre-feet in this category. The large sums that this storage would cost, is the safest and cheapest safeguard to an adequate supply of water for any contingency that Denver can acquire.
It is true that Denver, since some time during the last World War, has made a phenomenal growth and therefore, claims this growth will continue indefinitely. The history of most cities in the United States shows exactly the opposite tendency, and only two cities—Chicago and Los Angeles—have had a continuous and high rate of growth without a break. Any decrease in the rate of growth would leave Denver with a proposed water system of inordinate size which would be a grievous financial burden, for it would be too large for a lesser rate of growth.

Finally, about all that Denver now has to offer this Committee in the way of a concerted plan for this proposed big enlargement is a series of disconnected statements, for there is not now in existence any sound, well-engineered plan for all this big work. Granting the present request of Denver would, therefore, be in effect the signing of a blank check in its favor, which does not seem consistent with the usual policies of the Congress nor of the United States.

WILDLIFERS AND DINOSAUR MONUMENT

All the nature lovers in the country seem to have rallied here to defeat the purpose to build a reservoir in Green and Yampa canons. This is not unexpected, they appear in force every time Western people want to use some of the natural resources of their own country and further their material welfare and if possible contribute to the strength and prosperity of the whole nation. Their slogan is that every unusual canan or other natural phenomenon should be left in its primitive state for the enjoyment of a mythical horde of sightseers—there are too many phenomenal places in the West for this to be sensible and, as in this case, the sightseers have to be physical giants it is, moreover, not very practical.

It would seem, however, that they are raising this uproar over a case that has already been decided. The original Dinosaur Monument was only 80 acres, which did contain some unusual fossil remains. In 1936, upon the insistence of local people the National Park Service reluctantly undertook the enlargement of the Monument, primarily to prevent unregulated use of this area by local stockmen, over whom there would, otherwise, be no control by either State or Nation.

Before acting, however, the Park Service sent an authorized representative to hold meetings in nearby towns to determine the public sentiment. Such meetings were held in Vernal Utah, and Craig, Colorado in June 1936. At these well-attended public meetings the idea of the local people was that grazing and other uses of the area should be controlled, but that the ultimate use of these river canons for storage should not be jeopardized. They were given the firm assurance of the Park Service representative that water uses would not be hindered, as has been read into the record in the hearing held by former Secretary Chapman in 1950. In spite of this evident recognition of the sound ideas of the local people, the Park Service at that hearing claimed it was surprised by the effort, soundly backed by official action at every step of the way to make the Park Service stand by its promises to the local people.

The duplicity of the Park Service is further attested by the fact that the dedication of the enlarged Monument contains a reservation for water use and that, further, there is in Interior Department files an inter-agency agreement to the same effect. Apparently therefore, this large delegation of Wildlifers is here on a mission that is contrary to executive policy as firmly expressed at every step in the past, and while it is within the power of the Congress to say what the final policy shall be, the policy of the executive is so often expressed there can be no doubt about it.
Just what do these Wildlifers propose. That these canons, practically inaccessible, and certainly so to the common run of humanity, shall be kept in their present wild, uncouth state and of no benefit to anybody. The small streams, and they are small during the tourist season, of muddy water, containing no game fish, shall be allowed to wander unimpeded down these canons, unfit as water supply for the very few venture—some people who will attempt to run these canons—just to satisfy the longing of many people for the primitive, but will never visit the places they have SAVED! By contrast, a good example of sound conservative use of similar places is the use made by the Bureau of Reclamation of the canons that enclose Lake Mead. Out of several hundreds of thousands of visitors annually at Lake Mead, the Park Service offerings attract only a few and many fish the lake without benefit of the Park Service, but there the Bureau got under way ahead of the Park Service and great good for both services and for the visiting public has resulted.

A great deal of horse-back engineering has been done by Wildlifers to show that other reservoir sites, some they claim to be cheaper, can be used in place of Echo Park. This loses sight of the prime requisite of this project. If the exposition made earlier in this statement is convincing, the prime object of the Storage Project is the salvage of the last drop of water Colorado river is capable of yielding, even at a somewhat higher cost.

None of the alternative sites compares with Echo Park in quality of evaporation loss. These deep canons, one narrow and running roughly north and south, will admit sunlight in very few places for more than a few hours a day, and in many places not at all. The other canon running roughly east and west is so deep it will shade the water most of the time. It is quite evident the Wildlifers do not understand this, and moreover do not care about it, but the people who must underwrite the Storage Project must save every acre-foot of evaporation loss possible, and know how to do it, without in their opinion, doing an injury to canons which will still be unique.

When the Wildlifers appear in this hearing they will claim that to allow Echo Park to be built is a threat to every other National Park and Monument in the country. There is exactly no foundation for such a statement, for the reason that in this instance, and this is the only known instance where this is true, a valid reservation has always been in the record from the earliest connection of the Park Service with this Monument. The preliminary meetings held in Vernal and Craig in 1936 before the Park Service decided upon the enlargement, show that the wise decision of the local people enforced upon the Park Service then, and the reservation is still binding, the right to use these providentially provided canons for their most obvious human use—the storage of water!

Finally, the people who live in this basin are not insensible to its beauties, if they were they would leave it, but of this no Wildlifer can probably be convinced. But they are also well aware that this and many other resources of this region must be utilized by storage of water in the most strategic spots, of which Echo Park is the chief. They, therefore, favor a wise, conservative use of these unusual facilities nature has provided and expect that, as at Lake Mead, many more people will visit and enjoy this area when the Bureau of Reclamation makes it available to visitors, which the Park service has not yet started to do although the area has been under its jurisdiction for 15 years!