June 12, 1932

Colonel Ed Fletcher,
Blackstone Hotel
Chicago, Illinois.

My dear Colonel Fletcher:

Herewith a map for reference while reviewing this outline; also refer to pamphlet issued by Imperial Irrigation District, January, 1932. In this pamphlet you will find descriptions of the plants for de-silting of the water at the Imperial Dam on the Colorado River (page 1); capacity of All American Canal from dam to point west of sahd hills (page 5); cost and plan payment (pages 6, 17 and 21); electric power possibilities (pages 7, 25, 25, 30, 32 and 37); supply and division of water (pages 7, 8, 9, 26, 27, 28, 29, 30 and 32).

RIGHT TO USE ALL AMERICAN CANAL WATER AND POWER.

Particular attention is called to article 21, page 52 of the All American Contract, which states that the U. S. reserves the right to at any time prior to the transfer of constructed works, increase the capacity of said works and contract for such increased capacity with other agencies for delivery of water for use in the U. S.; that such agencies are entitled to participate in power development on said canal at points where and to the extent that the water diverted and/or carried for them contributes to the development of power.

This provision permits the increasing of capacity to take care of the Los Angeles Metropolitan Water District of Southern California, and San Diego City and County; also the use of their share of the power developed from the drop of their share of the water.

THIS IS RIGHT TIME TO ARRANGE FOR USE OF CANAL AND CONTRACT FOR POWER.

As work is not even started there is plenty of time to arrange for this extra capacity and to arrange for installing power plants to utilize the flow of the canal at the drops, so that the entire output of power can be used in pumping at the station about 40 miles west, — Imperial selling her share of the power to the Metropolitan District and San Diego, the payments to be applied to All American Canal Contract until it is paid out and then to the Imperial Irrigation District.

GENERAL OUTLINE OF PROJECT

Under this plan water for the Coastal plane is taken from the Colorado River at Imperial Dam, located a few miles North of Yuma. There the water is de-silted in the plant prepared under the All American Canal Project; then the water is carried in the All American Canal near the Mexican line along with the Imperial Irrigation Districts water to Calexico; from Calexico it would be carried in open ditch to a point west of Dixieland.

At this point it would be picked up by pumps and forced through a pipe line to the East end of a tunnel about 35 miles in length, which would have an elevation of from 720 feet to, say 900, (the height depending on whether the Capitan Dam was abandoned by the City of San Diego), passing through the tunnel in a canal built under a double track railroad, which is carried on steel ties extending well out over the sides of the canal, so that the shocks and vibrations of the trains are taken up by the ground and rock in place, leaving the canal which would be re-inforced cement lined, free of any injuries resulting from direct contract with the tracks.

This tunnel would emerge at an elevation of 650 feet if Capitan were abandoned, and at 750 to 800 with Capitan in place. Here the water is turned loose in the San Diego River bed to fill a lake or storage reservoir created by a dam at Mission Gorge, built probably at the 275 contour and to a height of 325 feet, which takes it to contour 600. At this contour it will flood an area of over 20,000 acres to an average depth of 200 feet. As the map shows it will be 15 miles long. It will contain about five times the water in San Diego Bay; will have an area three times that of Lake Elsinore; contain over ten times the water which can be stored in the Los Angeles Aqueduct System, according to a report given me by W. F. McClure, state engineer in his report to the Governor of California of January 9, 1925.

Tapping the Mission Dam at an elevation of about 400 to 450, for a supply to feed the canal and pipe line to Los Angeles, by way of the Coastal Mesa to Capistrano, and from there on along the line of the Santa Fe, following the foothills to the East and North of Irvine Ranch valley and skirting the foothills to the East and North of Santa Ana, Orange, Anaheim and Fullerton, up near Whittier and across from there to Los Angeles. This canal would furnish gravity water for irrigation to the bulk of the frostless farm land in these Counties, and would leave the supply now available, and that which may later be developed from higher elevations, to be used on the territory above the line of this system; thereby taking care of the water problem for many years to come.

R A I L R A D S

The Southern Pacific has a line from Yuma to Dixie, and would only have to construct say 15 miles of line on very easy grade, one percent or less, to reach the East portal of this double deck tunnel. From the West portal there is a good grade and road bed to be had by following generally the line of the old Cuyamaca flume to La Mesa. There the Southern Pacific owns the San Diego & Arizona to San Diego, which would be of temporary value as a line into the city, and over which to transport material and equipment for tunnel construction. From La Mesa it is probably practical to build Northwest, crossing the San Diego River near Mission Gorge site No. 3, and then following on an easy grade over the Camp Kearny Mesa and on Northwesterly gradually working down to connect with the Southern Pacific line at Santa Ana. If this were done the thru trains would make their San Diego stops in La Mesa, which would then become the front door entrance, and a part of the City of San Diego; freight to and from San Diego being shifted from the main line yards to the East of the city, or in what would be the east side of the city. By following the lines suggested there would be a gradual climb from Santa Ana to the East portal of the 35 mile tunnel, reaching there at about 700 foot elevation and dropping from there down to sea level in some 15 miles on a less than one percent grade.

Just think what it would mean to be able to shift freight at any time from Los Angeles, and points along the line, to a line which could handle hundred car trains with one engine in either direction. The tunnel work would, of course, be done by electric motors, and as that would be the case it would probably be possible to save some in the height of the tunnel as it would not be necessary to build it higher then need be to accommodate reasonable freight loads and passenger equipment, locomotives which are generally considerable higher than other rail equipment would never need to enter the tunnel.

The Santa Fe could well afford to build from near Parker across the Imperial Valley, take over this tunnel, connect up with its line in San Diego County, etc., eventually it would be a busy line carrying both freight and passengers to and from Phoenix and Los Angeles, and developing many thousands of cars of freight along its lines, due to the adopting of this plan to irrigate the Coastal plane and develop it.

I think the railroad problem is more or less a delicate matter, as they are so strong politically and influentually. I hesitate to recommend which railroad to take it up with first, but I could suggest a plan which would be good for both roads and for the general public, as well. What should be done is for the Southern Pacific to let the Santa Fe operate over its tracks from the west side of Imperial Valley to Phoenix, the Santa Fe only handling thru freight over these lines- and in return the Santa Fe would let the Southern Pacific move its freight from Santa Ana and points North, as well as passengers, over the Santa Fe lines to the west side of Imperial Valley. The Santa Fe could in this case construct a road along the lines suggested, by way of No. 5 damsite, Camp Kearny, etc., possibly following their present route to vicinity of Del Mar, then making an easy grade to the Camp Kearny Mesa.

By this last arrangement the Southern Pacific would be allowed to handle what freight and passengers would originate in the territory south of San Diego now served by the San Diego & Arizona. With this tunnel in operation the San Diego & Arizona could be abandoned. It cost $15,000,000 to build, but it will always be a very expensive road to maintain, and on account of its 3600 foot summit it is very expensive to operate. The Southern Pacific could and would, no doubt, route many thousands cars thru to Santa Ana and Los Angeles over this new line and save the congestion of the main line as well as save the cost of climbing an extra 2000 feet to the summit at Banning and Beaumont. Also have clear sailing, free from city limit nuisances and delays which occur to freight passing through the many small towns and cities between Los Angeles and the summit at Beaumont.

Remember the Santa Fe has a summit northeast of San Bernardino of over 3800 feet. It takes power to put trains over the extra 3000 feet which it must climb to reach the same points which can be reached by the use of this tunnel, in the same distance or less.

The Southern Pacific has developed the Imperial Valley and is equipped to take care of the freight which the Valley produces. The Santa Fe has pioneered in San Diego and Southern Orange Counties, and it can very easily expand to take care of all freight and passenger increases in that territory, between San Diego City and Santa Ana.

MILLIONS IN COST AND ANNUAL OVERHEAD SAVED.

I must mention the fact that I believe this entire project can be

completed at a cost not exceeding the cost of the Parker route, which has a pump lift of 1600 feet. In saving the extra 800 or 900 feet of lift we would be saving Los Angeles even unto the hundreds of thousands of dollars annual cost of pumping to the higher level, and in addition we will have secured a railroad route which should be worth a good many millions to some one and will save interest on a vast number of millions in the course of the next few decades.

LAGUNA SALADA

The Laguna Salada can be drained, cleaned out and used as an additional storage at any time that a satisfactory arrangement can be made with Mexico. It would be only necessary to tunnel about 4 miles to take the water from the Laguna to a point five miles from the main ditch. It is a fact that this system is complete without the Laguna Salada as we have the largest storage basin for fresh water on the west side of the mountains, but if at any time it was thought advisable to increase storage capacity or develop more water, the Laguna Water could be carried through the canals and tunnel, here suggested.

Following is quoted from an article prepared by myself a few days ago, and which may contain some repetitions, but touches on some points that I have not dealt with above:

COMBINED WATER AND RAIL PROJECTS TO TAKE CARE OF THE NEEDS OF THE LOS ANGELES2SOUTHERN CALIFORNIA METROPOLITAN WATER DISTRICT AND THOSE OF SAN DIEGO CITY AND COUNTY AND PROVIDE A LOW LIFT FOR ALL THE WATER TAKEN FROM THE COLORADO TO THE COAST, AT THE SAME TIME PROVIDING A RAIL ROUTE WHICH WILL CUT THE GRADE FROM LOS ANGELES TO YUMA DOWN TO ONE HALF OF ONE PER CENT THE ENTIRE DISTANCE (EXCEPT POSSIBLY A GRADE UP TO ONE PER CENT A DISTANCE OF THREE OR FOUR MILES JUST BEFORE ENTERING THE EAST END OF THE TUNNEL. THERE A BOOST BE GIVEN BY YARD ENGINES IF NECESSARY).

GENERAL OUTLINE

It is contemplated to bring the water alloted to the Metropolitan Water District and the water allotted to San Diego through the de-silting basins provided by the All American Canal project; then on through the All American Canal along the Mexican Line to Calexico; and on West, at as high an elevation as possible, by gravity, to a point Westerly from Dixieland. At such point install pumps to force the water through pipe line a distance of around 15 miles to enter a tunnel at a point near the northwest corner of Township 15 South, Range 8 East, at an elevation of from 670 to 720 feet. From this point the water will be carried through a straight tunnel, for a distance of around 35 miles, to a point near the Northeast corner of Township 15 South, Range 2 East, emerging at an elevation of from 650 to 700 feet in the canyon of the South Fork of the San Diego River. Here the water will be turned loose to flow into the San Diego River Valley, there to be impounded by a dam at Mission Gorge which will be built to contour 600, tapping the dam at around contour of 450 to feed an aqueduct to the Los Angeles Metropolitan District, consisting of open canals and siphons where necessary, following quite closely the general contour of the Coastal Plane through San Diego County, and on through Orange County, maintaining the highest grade at which sufficient flow would be obtained. It should be possible to deliver by gravity from the Mission Gorge Dam for the irrigation of practically all the tillable land in Orange and Los Angeles Counties.

Under this plan a part of San Diego's allotment of water would be

obtained from the main aqueduct, just before the drop into San Diego River Valley at an elevation of around 650 to 700 feet, and carried along the route of the present Cuyamaca flume line supplying irrigation water for the La Mesa, Irrigation District, and also to other frostless lands in the Jamacha, Sweetwater, Chula Vista and Otay Mesa. The remainder of San Diego's allotment would be drawn from the main aqueduct running north through San Diego County.

PLAN ALLOWS USE OF OTHER WATER FOR HIGHER ELEVATIONS

In San Diego County as well as Los Angeles and Orange Counties it would be quite likely that arrangements could be made so that the water from this project would supply the territory which it would cover by gravity, after leaving the west end of the tunnel, and in so doing leave available an abundance of water from projects all ready completed to take care of all demands for water at elevations higher than this project would supply by gravity.

UTILIZING ELECTRIC POWER

In connection with this project it may be practical to utilize the electric power which can be developed by the Imperial Irrigation District in its All American Canal, due to the drop from Imperial Dam on the Colorado River to sea level at Calexico. This would depend on whether it can be developed at a cost less than power can be obtained from Boulder Dam, and whether the irrigation district wishes to make a deal with the Metropolitan District and/or San Diego for the use of same.

The question of where to utilize the electric energy possible to develop from this project, would be determined so that it would accomplish the greatest saving or return, but it would seem possible that it might be best to apply it directly to the task of lifting the same water which generates it, in its fall. Due to the short distance the current would have to be carried (only 40 miles) and to the fact that there would be only one terminal point for the whole supply, at which the whole supply would be utilized, it may mean quite a saving to use this power.

INCREASING CAPACITY OF ALL AMERICAN CANAL.

The All American Canal project would have to be increased in capacity comparatively little to take care of the de-silting and carrying of the water required by the Los Angeles Metropolitan District and San Diego County. In fact, the All American Contract with the Government calls for a canal of 15,000 second feet from the dam on the Colorado to siphon drop, a distance of about 12 miles, then a capacity of 13,000 second feet to Pilot Knob, a distance of about six miles, and from there on west through the sandhills, for a distance of about 15 miles it provides for 10,000 second feet. At this point the canal would be capable of carrying over 7,000,000 acre feet a year, which is more than the combined supply necessary to take care of Imperial, Coachilla, Los Angeles and San Diego's needs for many years. In other words, it will take care of Imperial and Coachilla's needs about twice over, leaving around 3,000,000 acre feet unused; about one-fifth of this extra capacity will carry all the water for the project contemplated, which totals about 650,000 acre feet.

I here refer to Article 21, Page 32 of the All American Canal Contract, in which it is stated that the United States reserves the right at any time prior to the transfer of constructed works to the Imperial District, to increase the capacity of the said works and contract for such increased capacity with

other agencies for the delivery of water for use in the United States, and providing that such other agencies be entitled to participate in power development on said All American Canal, at points where, and to the extent that the water diverted and/or carroed for them contributes to the development of power. Said Article also provides for an equitable division of costs to be borne by the agencies which may participate in the increased capacity and power development provided for in this Article 21.

It is quite plainly seen that this Article 21 provides definitely a course of action which permits of the carrying out of this plan, insofar as the diversion of water for the Metropolitan District of Southern California and San Diego at the Imperial Dam is concerned, as well as the use of the All American Canal and a participation in the power developed thru the dropping of this water from Imperial Dam to Calexico.

ABANDON EL CAPITAN DAM

If it were possible to get this project to the point where it was assured of completion, it would then be advisable for San Diego to abandon the Capitan Dam, make a compromise settlement with the contractors, a saving of a couple of million dollars, which could be utilized in advantage in connection with this project. Or, if it was thought advisable a dam could be built by San Diego at a site on the River above the point that it would be necessary for a 600 to 650 foot elevation tunnel to emerge.

LIFT OF ONLY 670 to 720 FEET

Allowing two feet to the mail fall thru the tunnel it would mean a lift of from 670 to 720 feet to the East end of the tunnel from the open gravity canal at a point west of Dixieland.

SAN DIEGO CITY SUPPLIED FROM MISSION GORGE

If this project is completed, San Diego's needs can be amply provided for from the large dam at Mission Gorge. An extra five or ten feet added to the big dam at Mission Gorge would provide as much water as Capitan will hold.

EVAPORATION AND RAINFALL

In this connection, the water which will fall on this reservoir site direct, will be about one foot a year while the evaporation may be perhaps 150,000 to 200,000 acres, has an average rainfall of at least one foot a year for the Westerly 50,000 acres, probably two feet a year for the next 50,000 to 100,000 acres, and the Easterly 50,000 acres lies at elevations running from around 3000 feet to 6500. Much of this 50,000 Easterly shed is subject to a combined rain and snow fall which bring its total water productivity up above all most any point in the State south of Red Bluff. Putting two and two together, the total runoff into this reservoir may amount to enough to take care of all evaporation and in addition provide an appreciable amount of water.

COST OF RIGHTS OF WAY

Rights of way for the canal in Imperial Valley should cost comparatively little, as the Irrigation District has rights already, which could be used if necessary; also the land which it might be necessary to acquire is mostly rather poor land, valued at around $100.00 per acre for that in cultivation, while the remainder, required to cross, could be easily had at from $10 to $50. The right of way from Dixie to the tunnel crosses mostly Government land, desert, and the Government would grant the right of way. The 15 mile lake from the tunnel to

the Dam takes care of that musth distance the water travels, and from the Mission Dam the route of the aqueduct would be such that very little high priced land would be crossed, for the most part skirting along the foot hills above the lands which have been in cultivation.

COST OF MISSION GORGE RESERVOIR SITE

The reservoir site contains perhaps 10,000 acres of fairly good farm land, lying too low to be frostless, and only capable of producing such crops as are easily produced throughout the great Sacramento and San Joaquin Valleys, and other sections where frost is likely to occur. These 10,000 acres would be worth around $50.00 per acre from a farm standpoint, but on account of the location, close to San Diego and adjoining the frostless lands which fringe the valley, they are held at probably an average of not over $150 per acre. This includes river sands, sloping adobe lands and rocky sloping lands, together with the better quality of frosty lands, which are farmed to grain, grapes and other deciduous fruits. There may be a couple of thousand acres of good river valley land, worth say $500 per acre for alfalfa and other purposes; then there may be around 1000 acres of good citrus orchards which would have to be acquired, say 1500 acres, good, bad, etc. in citrus. Average worth about $1,000 to $1500.00 per acre. Then there are the home places in and around the towns of El Cajon and Lakeside. The balance of the land lies in the ownership of the City of San Diego, (acquired for reservoir purposes and water rights), except, say, around 5,000 acres of practically worthless rocky hillsides fringing the edges of the reservoir site, most all around. In this connection it would cost practically nothing to acquire the additional lands which it would be necessary to acquire to reach the 650 foot contour, and this should be kept in mind when acquiring these lands. In the case of a few hundred acres of good orchard it would be advisable to pass up purchasing at this time perhaps, unless it appeared that it would not be long before the dam would be raised to the 650 foot contour.

LAGUNA SALADA

There has been suggested a plan to utilize the Laguna Salada lying in Lower California, as a storage reservoir for the Metropolitan District of Los Angeles and San Diego, thus capturing flood waters of the Colorado which come past Boulder Dam, or reach the Colorado below the Boulder Dam. If arrangements satisfactory to all concerned can be made to use this large storage space, then it would be entirely practical to carry the water from these through a short tunnel, (which tunnel it is already contemplated to build) about 4 or 5 miles in length, large enough only to carry the water needed, then by open canal about 5 miles to a junction with the main canal crossing Imperial Valley, from which point it would flow on down to the pumping plant and be lifted and sent through the tunnel along with the other waters of the Los Angeles and San Diego Districts.

METHOD OF CONSTRUCTING RAILROAD AND CANAL THROUGH TUNNEL

It is planned to make the tunnel through the mountains of sufficient size to take care of a double track railroad, as well as the canal for the water. In order to determine the advisability of so doing, fairly reliable estimates should be obtained on the cost of construction of a tunnel of sufficient capacity to carry all the water needed now or liable to be needed in the future; also the estimated cost of a water tunnel in connection with a single track railroad; and the approximate cost of making a real job of it, putting thru a double track. By that I mean the height and breadth to be standard, and by simply excavating, say five feet deeper, make a channel for the water to run in, under the railroad

tracks. This canal could be of the required depth, and as wide as necessary up to the full width of the railroad tunnel. The railroad would be carried on steel ties which would span the canal and rest on the rocky formation on either side. In this way, the vibrations from the trains would be absorbed, and the canal, which would be cement lined, would not be called on to carry any of the weight of the railroad. In the event it was advisable to have the water canal as wide as the tunnel required to accommodate a double track, then it would be advisable probably, to have the steel ties project beyond the line of the walls of the tunnel to assure ample support, clear of the canal banks. This could be accomplished without weakening the tunnel, by excavating holes just large enough to take the ends of the ties for the required distance, then placing the ties immediately, cement them in place by thorely filling the hole which had been excavated to accommodate them.

The flume or canal running under the car tracks would be covered with some sheet metal, to protect the canal waters against polution from passenger trains. As it would not be necessary to take any locomotives through this tunnel it would be possible to hold it down in height.

SANTA FE RAILROAD

Taking up the routing of a railroad from the tunnel East — there is the Santa Fe which would do well to build across from the vicinity of Parker, thus tapping Imperial Valley and providing a low grade outlet from San Diego, and probably even more important, an outlet for freight from as far North as Los Angeles, relieving the situation over the mountains out of San Bernardino from this extra burden, and saving greatly on the cost of moving it. The Santa Fe would have a fairly busy line by way of Parker and it may be this route would develop into a more direct line thru, or near Ripley or Blythe, and on to Phoenix. I am not familiar with the possibilities in Arizona, but it seems certain that saving perhaps several feet, perhaps on this account, taking both water and rail through a hole only slightly larger than the standard, two track railroad tunnel. This would be developed into a much easier and shorter route from Phoenix to Los Angeles, thereby giving the Santa Fe a chance to route from their main line in Arizona by way of Phoenix to Los Angeles. I have not the time to look the matter up definitely, but it is within the bounds of reason to expect that this new route would eventually prove to be the most economical as well as the shorter and faster route for the Santa Fe to use.

SOUTHERN PACIFIC RAILROAD

Next comes the Southern Pacific. It now crosses the mountains East of San Diego at an elevation of around 5600 feet, over a line that cost $15,000 to build, and which it will always cost a lot to maintain. It also crosses the mountains near Beaumont and Banning at around 2600 feet on the direct route from Los Angeles to Yuma.

It would be possible for the Southern Pacific to utilize the route they have from Yuma to Dixieland and at a point perhaps near the Gypsum plant west of Dixie, leave their present line and build directly to the mouth of the tunnel; there establish a yard and terminal for steam power, operating up the grade with the same electric motors which were used through the tunnel, adding a helper from the yard to the tunnel when trains were too heavy for the motors to handle on a one percent grade.

RAIL ROUTE WEST PORTAL OF TUNNEL TO LOS ANGELES

Leaving the west end of the tunnel, a good road bed can be obtained at very light grade from there to La Mesa. Maintaining approximately the level of the west of the west end of the tunnel, it would be about 15 miles to La Mesa. From La Mesa a good grade can be obtained, around one percent or a little over would be practical, this distance perhaps 10 to 12 miles. (The Southern Pacific already owns a line from San Diego to La Mesa which would do temporarily). From La Mesa, if it was thought advisable, it is possible the main line carrying traffic from points north of San Diego, Los Angeles, Orange County, and thru freight, could be carried northwesterly from La Mesa, crossing the San Diego River at an elevation of around 400 feet, by a bridge across a narrow pass, then following at about that level across the Mesa at Camp Kearney, and from there find a route in which they could absorb the 500 foot elevation of Camp Kearney, and connecting up with their own line again at Santa Ana in Orange County, at an elevation of 133 feet. In any event, the Southern Pacific would be able to get a line through from Los Angeles to Yuma which would be but a trifle longer than the main line is from Yuma to Los Angeles and at an elevation of less than a thousand feet, probably 750 or 800 feet at the most.

JOINT TRACK ARRANGEMENT

If either one of these roads would take an interest in promoting this project, it could be arranged that they could have the rights of operating thru the tunnel, and it could be provided that they would take the trains of any other company through at any time, but at a price which would justify the haul. Or, the Santa Fe and the Southern Pacific could enter into a joint track agreement whereby the Santa Fe built from near Parker west and thru the tunnel, and developed its route to a better grade thru San Diego County, allowing the Southern Pacific to use the Santa Fe tracks from Santa Ana or south, and thru the tunnel to a yard which would be located on the west side of Imperial Valley. If the Southern Pacific and the Santa Fe made such an arrangement for the use of the tunnel and the Santa Fe tracks to Santa Ana, and in turn the Southern Pacific granted the Santa Fe the joint use of the Southern Pacific tracks from the west side of Imperial Valley on across the Valley and to Yuma, and from Yuma by the new cut off to Phoenix, it would be a very equitable arrangement, a toll or mileage charge could be worked out so that the benefits of a joint operation and saving in operating costs could be properly pro rated, giving each road the benefit and the community in general a reasonable benefit. By the last suggested joint track agreement it might be advisable for the Santa Fe to agree to handle only through trains over the Southern Pacific tracks from the west end of Imperial County to Phoenix. In exchange the Southern Pacific could agree to handle only through trains from Santa Ana to the west end of the Imperial Valley. EXCEPT that the freight or passengers which would have been secured by the Southern Pacific in San Diego and points now served by the San Diego & Arizona Railway, would be carried over the Santa Fe tracks from La Mesa east and thru the tunnel.

SEPARATE CORPORATION COULD OPERATE THROUGH TUNNEL

Of course the tunnel could be owned by a separate corporation, which would take any ones freight through at a definite rate, also passengers. In this case, the company owning and operating the tunnel would also have to operate a rail line from the mouth of the tunnel to some convenient point for any railroad to connect with. With the development which is certain to take place, as a result of the construction and completion of this project, it is certain that somebody in the railroad business is going to secure enormous additional tonnage, and many extra passengers, due to the requirements in the way of materials necessary

for the construction of the project, and due to the increased production which will take place all the way from the Mexican line to and around Los Angeles. The new opportunies which will open up, will draw other millions of new capital, which will be invested in a hundred and one new enterprises, which will develop or be imagined by the promoters. Stimulant such as this kind of a project would bring back the good old booster spirit, and where there are now growls there would be cheers. To touch this project with a schedule of completion in three or four years, which should be possible, would be like starting an avalanch down a mountainside, nothing would stop us again, until we had made an even greater advance than we have ever made in a like time.

COMPARATIVE COST AND SAVING

As to cost: I have only been able to conclude that this program can be carried out for many millions less than the Parker route project; that in the long run it will save the Los Angeles or Southern California Metropolitan Water District paying several millions each year; for all time - as the cost of lifting the water the additional 800 or 900 feet, which they must do, to reach the 1600 foot level which they contemplate.

I have been told that it has been estimated that the Cpital Cost of lifting the water for the Metropolitan District is around $80,000 per foot. Even at five percent interest that would mean a perpetual cost of $4,000 per foot lift, or 800 times $4,000, which is $3,200,000 a year. This sounds rather large to me, but even reduced to as low a figure as it could be possible, it would still leave a very large saving per year to get rid of that extra 800 foot lift. On the Parker route I am told there will be considerable over 100 miles of tunnels. I feel safe in guessing that the 35 mile tunnel suggested by me can be built to carry the water, and the double track railroad for less then the tunnels on the Parker route can be built to carry only water. With a tunnel large enough so standard railroad dump cars can be hauled out in trains of 100 cars to the train, if desired, and with the two tracks it would always be possible to switch empty cars to the front for loading, under such conditions, with all attention and ingenuity fixed on the one large task, I believe that working from both ends, the long tunnel can be completed in, say, four years. I realize this would be a record, but the use of electric power, etc should show big results on a job of this kind. If the tunnel can be built with the money which would have been spent on the Parker project for tunnels, then we have left the amount which it would take to build the 200 miles of pipe line and open canal which make up the Parker route not taken thru tunnel. If we can construct an aqueduct from Mission Gorge to Los Angeles at a cost per mile equal to the cost per mile of the Parker Route not in tunnel, then we have absorbed 125 miles of the 200, leaving us the amount that it would cost to complete the remaining 75 miles of the Parker route, with which to get the water from Yuma to the east end of the tunnel, a distance of 120 miles perhaps. But all but 45 miles of the distance will be taken care of by a slight addition to the All American Canal Project, and the 45 miles is an open ditch proposition except the last twelve or fifteen miles, which will necessarily be pipe through which to push the water up the 700 feet to the east end of the tunnel. If in completing this project, we have been able to pay our way with the $220,000,000 which it would have cost to complete the Parker project, then we can credit this project with the saving of the everlasting overhead of pumping the extra 800 feet, which it appears would run into hundreds of thousands each year, and we can also credit this project with whatever part of the costs the railroads are willing to stand in return for the use of the tunnel, which will be a few more millio or the interest on some sondierable millions; AND we can also

credit this project with furnishing one of the greatest storage reservoirs ever provided, the cost of which, together with the Mission Dam will be so few millions as to seem almost trivial in contrast to its great value to the entire Southern California Coastal Territory.

CAPACITY OF RESERVOIR

This reservoir covering 20,000 acres of ground to an average depth of 200 feet will contain about five times the amount of water in the Bay of San Diego, will flood to a depth of 200 feet an area nearly three times that covered by Lake Elsinore, will contain about ten times the amount of water it is possible to empound in Owens Lake, with a 160 foot dam.

As an alternative proposition, a siphon could be constructed from a point on the All American Canal, at say 250 feet elevation, carrying the water directly across to, say, 200 foot elevation on the West side of the valley. The question of final cost, and operative costs would determine the choise between an open canal, with drops generating power; the power in turn to re-lift the water, and the siphon plan. In this case it should be kept in mind that there will be several times as much water carried over the drops for use in the Imperial and Coachilla Valleys as there will be carried on West to be lifted to the tunnel. For that reason, provided the power can be developed cheaper for the Canal Flow than obtained otherwise, I think likely it would be more economical to drop the water along with Imperial District water, and through their power plants, carrying it in the open ditch to the point close west of Dixieland and there utilize the power to force it up.

Yours very truly,

(signed) L. H. FRANCISCO

LHF:M

Ed Fletcher Papers

1870-1955

MSS.81

Box: 37 Folder: 2

Business Records - Reports - Francisco, L.H. - "All-American Canal"