MEETING OF BOARD OF DIRECTORS
TARRANT COUNTY WATER CONTROL and IMPROVEMENT DISTRICT NUMBER ONE

July 25, 1957 at 10:00 A.M.

At a meeting of the Board of Directors of TARRANT COUNTY WATER CONTROL and IMPROVEMENT DISTRICT NUMBER ONE, held in the District General Office, Fort Worth, Texas, with the following Directors present, to-wit:

PRESENT	ABSENT
Joe B. Hogsett	0
Houston Hill	
Lacy Boggess	
W. L. Pier	
A. T. Seymour, Jr.	

Also present were Mr. Ben F. Hickey, General Manager of the District, Mr. Sidney L. Samuels, Attorney for the District, Mr. Simon W. Freese of Freese & Nichols, Engineers for the District, Mr. L. R. Howson and E. E. Erickson, Consulting Engineers.

President Hogsett stated that this meeting was called for the purpose of Mr. L. R. Howson's presentation, and report, on a future water supply for Tarrant County, Texas, as requested by the Directors in December, 1956. President Hogsett then called upon Mr. Howson, who stated:

1.

"In accordance with your authorization we have made a study of the present and probable future water requirements of Tarrant

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County and the practicable means of meeting them. We herewith present our report thereon including recommendations as to procedure.

Tarrant County is experiencing a rapid growth both in population and water use. It gained approximately as much in population in the last ten years as in the entire century up to that time. During the last three decades Tarrant County has grown at a rate double that of the entire United States and nearly 50% more rapid than the State of Texas as a whole. Its water use also substantially doubled in the past ten years. The last seven years of this rapid growth were in a drought period which exceeded in both severity and duration any other recorded drought in the area. That water requirements could be met is a tribute to those who planned earlier. However, the margin of adequacy was so small as to demonstrate the immediate necessity of enlarging the water supply. This is in no way affected by the recent surplus of water except that the full reservoirs provide time for construction of the new supply in an orderly manner and avoid the necessity of making expenditures for emergency measures such as piping water from the Brazos which would have little value in a comprehensive solution of the problem.

In making our study we have had the full cooperation of

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Freese and Nichols who made available to us the basic data and the studies upon which their report on the same subject is based. We used these data, checked their basic computations, made supplementary studies using other methods in some cases and have arrived independently at our conclusions relating to the best procedure, and we present our summarized conclusions and recommendations as follows:-

(1) POPULATION

We are of the opinion that water supply developments should be predicated upon the ability to serve Tarrant County populations estimated as

600,000	by	the	year	1960
1,000,000	"	"	"	1975
1,750,000	"	"	"	2000

(2) WATER REQUIREMENTS

Per capita water requirements are increasing in the Fort Worth area as elsewhere. We believe it prudent in studying future water requirements to proceed on the assumption that this will continue. We estimate that Tarrant County will require water in the future as follows:

Year	Ave. per Capita use gpd.	Water Requirement MGD
1960	152	* 91
70	175	*154
80	200	237
90	225	338
2000	250	430

*Freese and Nichols' estimate is 98 MGD for 1960 and 165 MGD for 1970 and has been used by us hereinafter. Our estimate is used for later periods. Our estimated requirements exceed Freese and Nichols by 40 MGD in 1990 and 86 MGD in the year 2000.

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CAPACITY OF EXISTING WATER SUPPLIES

The safe yield of water supplies is measured by their ability to deliver in periods of minimum availability such as the last seven years at Fort Worth.

During this period the Fort Worth reservoir system could have supported a uniform draft of about 60 MGD with a 2 year's supply in reserve. For the future this will be reduced by siltation in the reservoirs and by interception of flow through soil conservation terracing, stock tanks, etc. to about 50 MGD.

At present about 17 MGD is being pumped in Tarrant County from underground sources. This rate of withdrawal exceeds the recharge rate and as a result the ground water level is receeding at from 7 ft. to 11 ft. per year. It is estimated that the safe yield of underground sources in Tarrant County is about 11 MGD.

Other potential sources of water for Tarrant County are Grapevine reservoir (.2MGD) and Arlington reservoir (8.0 MGD).

ADDITIONAL WATER NEEDED

Additional water must be made available as early as practicable. The present sources would be deficient by the following amounts at the times indicated:-

Year	Additional Requirements (MGD)
1960	17.7
1970	100.3
1980	172.1
1990	272.9
2000	365.9

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Since in large public undertakings such as this "10 years ahead is the present" and about four years will be required to construct a major step in the enlargement program, it is apparent that provision must be made for bringing in 100 to 150 MGD in the first step.

SOURCES OF ADDITIONAL WATER

Fortunately Tarrant County has many alternatives from which to satisfy its future water requirements. Freese and Nichols studied and have furnished us the data relating to 16 potential sources not now developed. After reviewing all of these (the principal facts concerning which are assembled in compact form in Table B in the body of the report) we selected the following as the best and for complete study:-

1. Grapevine reservoir on Denton Creek.
2. Cedar Creek Reservoir.
3. Richland Creek reservoir storing Richland and Chambers Creek water including storage on Tehuacana Creek in a reservoir immediately adjacent to Richland Reservoir.
4. Boswell Reservoir on the Boggy River.
5. Hugo Reservoir on the Kiamichi River. (supplementing Boswell)
6. Lake Texoma.

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7. Increased storage on the West Fork of the Trinity either for water supply alone or as a dual purpose development with flood storage.

Since only projects capable of supplying 100 or 150 MGD or more will serve as more than a "stop gap", further storage on the West Fork of the Trinity which will increase the yield from the present reservoirs by only 35 MGD during drought even with 750,000 A.F. additional storage is uneconomic and would provide for only about five year's growth.

Grapevine reservoir can be enlarged so as to provide more conservation storage. While it would then have an increased yield of but 18 MGD, it can be advantageously utilized through purchase of conservation storage of an additional 200,000 acre feet estimated by Freese and Nichols to cost $4,350,000. Its use will be through a filter plant designed to serve the north-east part of the County as it develops and make unnecessary the construction of a long transmission line to serve that area.

Lake Texoma water is hard and high in sulphates and chlorides. Even when mixed with the present West Fork of the Trinity supply in the ratio of 70 MGD Texoma to 49 MGD Trinity (the 1966 condition) the mixed water would be nearly twice as hard as the present supply, the sulphates 5½ times as high and the chlorides 6 times as high. Since Lake Texoma is unsatisfactory for permanent use and is being considered only as a temporary

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expedient until Boswell Reservoir might be built and since the total construction cost will exceed that of Cedar-Richland Creeks which will yield 35% more water, Lake Texoma is not attractive for use by Tarrant County.

This narrows the selection to Cedar, Richland and Boswell. The pertinent facts with respect to these are shown in comparative form as follows:

	Cedar	Richland & Chambers	Richland Chambers & Tehuacana	Boswell
Drainage Area Sq. Mi	1,013	1,936	2,266	2,273
Reservoir Cap.A.F. Gross	678,960	1,135,000		
Net	608,060	1,000,000	1,400,000	444,000
Net per sq. mi.	600	518	620	200
Yield (MGD)	154	189	254	250
Yield per sq. mi (MGD)	.15	.098	.112	.113
Estimated Cost	$51,000,000	$62,500,000	$74,500,000	$117,325,000
Per MGD	$331,000	$331,000	$294,000	$470,000
Pipe Line Diameter	72"	84"	84"	72" & 84"
Length	78 Mi.	78 Mi.	78 Mi.	128 & 108 Mi.
Earliest Probable availability	1960	1975	1975	1966
If developed alone adequate until	1975	1980	1985	1985

From the above it is apparent that Cedar Creek, which can be available at least expenditure and at the earliest date and which also yields the best quality of water, is the best source for first development for Tarrant County. Other factors that influence this conclusion are:

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1. The availability of Cedar Creek is only limited by the construction period whereas Boswell depends upon Congressional appropriation, the allocation of conservation storage in a flood control project, and the necessary construction period. Boswell is also complicated by conflicting interstate interests and unpredictable Congressional action.
2. The Richland-Chambers-Techuacana Creek development will produce as much water as Boswell at a cost $43,000,000 less.
3. An expenditure of $125,500,000 will yield 408 MGD from Cedar in combination with Richland Creek. $117,000,000 spent for Boswell will yield but 250 MGD. The cost per MGD yield is 50% greater for Boswell than for Cedar-Richland-Tecaucana.
4. The Cedar-Richland-Tehuacana program will save nearly $30,000,000 in annual costs plus the $43,000,000 in construction cost in the next 40 years.
5. As compared to Richland Creek the Cedar Creek water is of better quality and its use does not require a period of leaching out the brine from well fields as is the case on the Richland Creek area.

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6. Cedar-Richland can be built in two or three steps whose yield would parallel the water requirements. Thus Cedar costing $51,000,000 and yielding 154 MGD could be built by 1961, Richland-Chambers costing $62,500,000 and yielding 189 MGD could be available by 1975, and Tehuacana added when necessary at a cost of $12,000,000 to yield 65 MGD. This would carry well beyond the estimated needs for the year 2000.

TEHUACANA CREEK

We believe Tehuacana Creek should be an integral part of the comprehensive water supply project. Its storage will serve to more fully and economically develop Richland-Chambers Creeks. It should be possible to so design the reservoirs that one spillway will serve both reservoirs at considerable saving in cost. The additional water can be transported through the Richland pipe line which should be cross-connected with the Cedar Creek line for greatest economy, flexibility and safety.

COST CONSIDERATIONS

The total cost of the water supply program herein recommended is estimated at $125,500,000. This will adequately serve beyond the year 2000. The population growth from the

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present to the year 2000 is estimated to be 1,250,000. The cost of an assured adequate water supply is therefore $100 per capita. Tarrant County is fortunate in having water resources which can be developed to the extent necessary and within such reasonable cost."

President Hogsett stated, after much discussion between all present, that in as much as some of the Directors had not had an opportunity to study the report of Mr. Howson as yet, it was his opinion that the report should be accepted and filed for further study, and this meeting with the approval of the Directors, was so ordered; whereupon Director Seymour made a motion, seconded by Director Boggess, that

WHEREAS, the City Council of the City of Fort Worth, at a regular session on October 31, 1956, did officially request the Board of Directors of the Tarrant County Water Control & Improvement District No. 1 to assume full responsibility for providing and maintaining an adequate supply of water for Fort Worth and the Tarrant County area, and

WHEREAS, the City Council of the City of Fort Worth did further officially request the Board of Directors of the Tarrant County Water Control & Improvement District No. 1 to adopt and pursue as the basic outline for such an adequate water supply the "Tentative Findings and Recommendations of Report on Water

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Supply for Fort Worth and Tarrant County" dated September 1956, prepared for the City of Fort Worth by Freese and Nichols, Consulting Engineers, Fort Worth, Texas, and

WHEREAS, by resolution dated November 2, 1956, the Board of Directors of the Tarrant County Water Control & Improvement District No. 1 accepted for and on behalf of the District the responsibility for carrying forward a plan which, together with such modifications thereof as might be required from time to time, would assure Fort Worth and Tarrant County area adequate future supply of good water, and

WHEREAS, the Tarrant County Water Control & Improvement District No. 1 has promptly and diligently entered upon their duties in discharge of the responsibility of securing such an adequate future supply of good water, and

WHEREAS, Tarrant County Water Control & Improvement District No. 1 has, in cooperation with the City of Fort Worth, been investigating and having investigated all possible future sources of a good water supply, and has invited the submission to it of any and all suggestions concerning such sources, and

WHEREAS, various suggestions and proposals have been made to, and received by, Tarrant County Water Control & Improvement District No. 1 as to future permanent sources of supply, and

WHEREAS, Freese and Nichols have completed their

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"Report on Water Supply for Fort Worth and Tarrant County" dated May 1957, and

WHEREAS, Tarrant County Water Control & Improvement District No. 1 has employed other outstanding engineering consultants to examine the report of Messrs. Freese and Nichols and also all other suggestions and proposals as to a water supply for Fort Worth, Messrs. Alvord, Burdick and Howson, Consulting Engineers, of Chicago, Illinois, having been employed to review all reports and suggestions, as well as independently study the problems involved, and advise the District on the feasibility and quantity of water; and Mr. Sheppard T. Powell, Consulting Engineer, of Baltimore, Maryland, having been retained to similarly advise the District on the question of quality of water, and

WHEREAS, the Tarrant County Water Control & Improvement District No. 1, in pursuance of the responsibility assumed by it, and in cooperation with the City of Fort Worth, has been actively protecting, defending, and strengthening the Certified Filings, Permits, and Presentations as to a water supply in the Trinity River watershed now possessed by or belonging to the City of Fort Worth or the Tarrant County Water Control & Improvement District No. 1 from and against any and all harmful claim and damage, and

WHEREAS, the City of Fort Worth is the owner and holder of:

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(a) Presentation No. 1322 covering a location on Chambers Creek in Freestone and Navarro Counties, Texas, which will expire on October 18, 1957.

(b) Presentation No. 1323 covering a location on Richland Creek in Freestone and Navarro, Counties, Texas, which will expire on October 18, 1957.

(c) Presentation No. 1371 covering a location on Cedar Creek in Henderson County, Texas, which will expire on May 28, 1959, and

WHEREAS, the named and numbered presentations afford and give Fort Worth and the Fort Worth area valuable privileges, rights, and preferences, which could be waived or lost by failure to exercise promptly such rights, privileges, and preferences, and

WHEREAS, from an examination of all the suggestions and proposals made to the Tarrant County Water Control & Improvement District No. 1, and from the reports of Messrs. Freese and Nichols, Messrs. Alvord, Burdick and Howson, and Mr. Sheppard T. Powell, it now appears that a better water supply for Fort Worth and Tarrant County area will be secured at this time from the Cedar Creek area under Presentation No. 1371, and the Richland-Chambers Creek area under Presentations No. 1323 and 1322, with Tehuacana Creek area added, than from any other available

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source for a permanent supply, and

WHEREAS, it appears that great benefits will accrue to Fort Worth and the Tarrant County area by the prompt exercise of the privileges, rights, and preferences now held, or to be held, under such presentations by securing permits from the State Board of Water Engineers for the development of the sites listed above and the impoundment, diversion, and use of such waters, and

WHEREAS, it appears such Permits should be promptly secured for an additional water supply for Fort Worth and the Tarrant County area, and the securing of such Permits is one of the basic requirements for an additional dependable supply, and

WHEREAS, the Tarrant County Water Control & Improvement District No. 1 is ready, willing, and able to furnish to the City of Fort Worth any and all possible assistance in connection with the filing and prosecution of such application for Permits.

NOW, THEREFORE, BE IT RESOLVED by the Tarrant County Water Control & Improvement District No. 1, acting herein by its duly acting, elected, and authorized directors:

(1) Tarrant County Water Control & Improvement District No. 1 requests the City of Fort Worth to proceed, with all possible haste, to file applications for permits with the State Board of Water Engineers for the development of the presentations listed above and the water available thereunder.

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(2) Tarrant County Water Control & Improvement District No. 1 requests the City of Fort Worth to take such other, further, and necessary steps as may be convenient or indicated to prosecute and proceed with such applications until such applications have been granted and permits therefor issued by the State Board of Water Engineers.

(3) Tarrant County Water Control & Improvement District No. 1 hereby tenders its services and that of its officers, directors, employees, engineers, attorneys, and other personnel of every type and character, for assistance in filing, prosecuting, and securing such permits.

(4) The President of the Board of Directors be and he is hereby authorized and directed to execute this resolution, cause the seal of the District and the attesting signature of the District Secretary to be affixed hereto, and cause an executed copy of this resolution to be delivered to the City Council and Mayor of the City of Fort Worth.

Upon a vote being taken, the resolution was unanimously passed all directors present, voting "aye" thereon.

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There being no further business before the Board, the meeting was then ajourned.

President

Secretary

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