

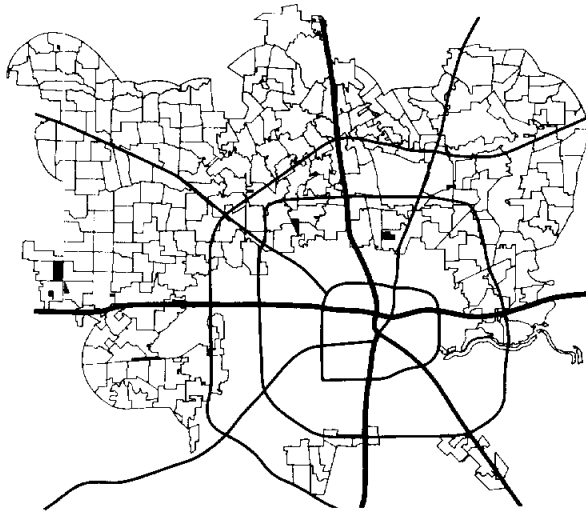
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Turner Collie & Braden Inc.

IN ASSOCIATION WITH
QUADRANT CONSULTANTS INC.

**A REGIONAL
WASTEWATER FACILITY PLAN
FOR THE CITY OF HOUSTON
EXTRATERRITORIAL JURISDICTION**

EXECUTIVE SUMMARY



**A STUDY PARTIALLY FUNDED THROUGH
A TEXAS WATER DEVELOPMENT BOARD GRANT**

OCTOBER 1989

ENGINEERS • PLANNERS

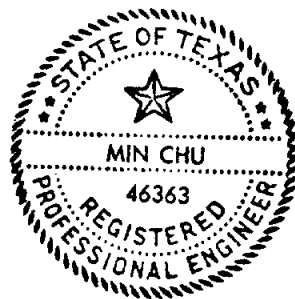
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Background

The history of development within the City of Houston's extraterritorial jurisdiction (ETJ), an area extending five miles beyond the current city limits, includes several decades of rapid growth which have fostered the proliferation of a large number of small wastewater treatment plants. These treatment plants often serve a single subdivision or a small tract of land. Historically, many of these small treatment plants have produced a lower quality effluent which has resulted in undesirable and serious water pollution problems in the region. It is often necessary for regulatory agencies to devote an unreasonable amount of time to inspect the small plants in an effort to maintain compliance with established regulations and discharge permits. A substantial amount of funding is thus required to support this monitoring effort. It has also been determined that these plants are usually less cost-effective than the larger regional municipal plants resulting in higher consumer costs. As such, potentially feasible solutions to alleviate the magnitude of these problems have been under investigation.

The City of Houston has recognized the need to effect the development of more efficient wastewater collection and treatment facilities and is progressing with projects to improve its own wastewater treatment system. Remedial actions currently undertaken by the City to correct the above mentioned problems include the construction of new treatment plants or the enlargement of existing smaller plants subsequent to a particular areas annexation. When it is determined infeasible to enlarge a smaller plant, it is usually abandoned. Over a period of 25 years, the City of Houston has abandoned 71 small sewage treatment plants. The expenses, however, involved with diverting sewage from an abandoned plant to a larger, more efficient plant are significant and often

includes the assumption of the bonded indebtedness incurred to pay for the abandoned facilities. As a result, additional costs are accrued by the City.

Realizing that a comprehensive effort was needed to resolve the wastewater problems in the ETJ, the Greater Houston Chamber of Commerce brought attention to the concept of wastewater regionalization in the early 1980s. The Chamber subsequently created a subcommittee to study the potential for system regionalization. Its efforts culminated with the preparation of a report entitled "Wastewater Regionalization Plan For Houston" which was completed in November of 1986. The report presented a comprehensive regionalization plan which entailed developing a system of larger wastewater treatment plants for defined service areas in the ETJ prior to annexation. It was expected that such a long range remedial action would increase operation efficiency, produce higher quality effluent, and reduce future costs to the City of Houston. The established goal of the regionalization plan, as delineated in the Chamber report, is to promote a planned level of service which minimizes the present problems without imposing requirements which significantly alter the free market environment of Houston. The Chamber's plan was ultimately endorsed by the Developers Council, the Association of Consulting Municipal Engineers, the legal Community, various citizen interest groups, and the City of Houston Departments of Public Works and Health and Human Services.

The Chamber's plan provided the impetus for the formation of a City Wastewater Regionalization Task Force by Mayor Kathy Whitmire in April of 1987. Task force members included various developers, utility district board members, citizens' groups, a Houston City Council member, various engineering and legal experts, the financial community, wastewater treatment plant operators, and the City of Houston Departments of Public Works, Health and Human

Services, and Planning and Development. Mayor Whitmire charged the Task Force with the responsibility of planning a wastewater regionalization program for the City of Houston within its ETJ. The primary focus of the Task Force was to implement rules to gain support for this program from the Texas Water Commission (TWC). Based on the efforts of the Mayor's Task Force, the Houston City Council unanimously approved a Wastewater Regionalization Resolution (Resolution No. 88-81) on August 10, 1988. The Council also consented to the acceptance of a Texas Water Development Board's (TWDB) grant for preparing a comprehensive wastewater regionalization plan for Houston's ETJ.

Regionalization Overview

Resolution 88-81 delineates the objectives and means of implementing a Wastewater Regionalization Plan for the ETJ of the City of Houston. The primary objectives of the Regionalization Plan, as specified in the Resolution, include the following.

- ° Improving and protecting water quality in the Houston metropolitan area.
- ° Eliminating the continued proliferation of small treatment plants.
- ° Avoiding duplication of funding for wastewater treatment facilities by minimizing the expenditures for interim facilities that will inevitably be abandoned.
- ° Encouraging continued land development with maximum flexibility consistent with the other goals of the plan.
- ° Preserving the free market environment in real estate development, while implementing the Regionalization Plan.
- ° Providing for the fair allocation of costs among developers, existing residents within the ETJ, future residents of the ETJ, and the City of Houston.

As presented and described in Figure 1, implementation of such a plan involves four key processes including service area plan adoption, initiation

of the application process, service area plan modification, and annual review of the adopted service area plan. The development of a service area plan for the City's ETJ represents the initial component of implementing the Wastewater Regionalization Plan and was the primary focus of this study. The following sections briefly summarize the overall procedures and results of the service area planning efforts.

Service Area Plan

Criteria

It is the City of Houston's intent to provide a framework for regionalization in the ETJ through the development of a general Service Area Plan which allows land owners and developers to plan and construct wastewater facilities to satisfy their needs within the guidelines of a long-range comprehensive plan. As specified in Resolution No. 88-81, the primary focus of the Service Area Plan entails the delineation of regional service area boundaries, regional plant site locations, and collection system rights-of-way. A primary product from the planning effort is to be a series of maps which define regional service areas within the City's ETJ. Service area designations were to be based on consideration of physical barriers to wastewater conveyance, and analysis of existing and projected demographic trends and development patterns. It also was necessary for the overall plan to be consistent with the key specifications outlined in the adopted Resolution. These specifications are as follows.

- ° A Service Area Plan which establishes approximately 2,000- to 3,000-acre service areas in Houston's ETJ will be developed and recommended by the Director of Public Works and Engineering to the City of Houston Planning Commission for approval and adoption by the City Council.
- ° No portion of the City's ETJ is to be outside a Regional Service Area. Enforcement of the Regionalization Plan is to be prospective only.

"Grandfathered" developments, those developments which have constructed all or part of their planned wastewater treatment facilities, are in the process of construction, or have obtained utility district financing for such facilities as of August 10, 1988, are exempt from the requirements of the Regionalization Plan. Although not required, these developments are encouraged to participate in the plan.

- ° Regional Service Areas shall be established in a manner that is compatible with existing development and makes it economically feasible for planned developments to participate in the plan.
- ° As growth and demand occur in regional service areas, regionalized wastewater treatment facilities will be implemented. Interim facilities which meet the following parameters will be allowed.
 - Minimum of 50,000 GPD treatment capacity
 - Maximum of 200,000 GPD treatment capacity for any one development
 - Cumulative capacity of interim facilities in a regional service area is not to exceed 15 percent of the total expected demand for the service area
- ° All development must be served by a regional facility when one becomes available or when the parameters for interim facilities have been exceeded. Each regional service area will have a single regional wastewater plant site and sized to provide wastewater treatment service to the regional service area.
- ° The implementation of regional facilities is not intended to limit the service area size nor implementation of metropolitan facilities. Metropolitan facilities will provide wastewater treatment at metropolitan plant sites and will be sized to provide wastewater treatment service to a metropolitan service area (over 10,000 acres).
- ° A specific plan for wastewater treatment will have the flexibility to allow the developer to select the financing vehicle and the source of payment for improvements or repayment of debt and will authorize any lawful form of financing, traditional or innovative, to achieve the most cost-effective financing. A specific plan for wastewater treatment must provide for service to all development within the regional service area and provide equal basis of participation.
- ° The City of Houston Planning Commission will conduct annual hearings on the revised Service Area Plan and will submit findings to the Houston City Council for approval.
- ° The Regionalization Plan is to be compatible with the rules and regulations of the TWC, the TWDB, and the Environmental Protection Agency (EPA).

Planning Results

The proposed Service Area Plan as developed through the above planning effort is presented in Exhibits 1 through 8. Exhibit 1 is an index map of the entire ETJ which divides the region into 7 panels which, in turn, provide detailed information of the Service Area Plan. Each individual panel, as illustrated in Exhibits 2 through 8, presents the defined service area boundaries for 245 service areas in the ETJ as well as the proposed locations of collection and treatment plant facilities.

To enhance the ability of quickly identifying and locating each service area on the above exhibits, a numbering system was chosen based on a grid which covers the entire Houston ETJ. The developed system, as illustrated in Figure 2, divides the service areas into four quadrants: Northwest (NW), Northeast (NE), Southwest (SW), and Southeast (SE). The boundaries for these quadrants are established by Interstate (IH) 45 to the north, IH-10 in the east and west, and State Highway (SH) 288 in the south. Within each quadrant a grid was set up with numbers of ascending value in the east and west directions from IH-45 and SH 288 and sequential lettering in the north and south directions from IH-10.

As shown in Exhibits 2 through 8, four distinct Regional Service Area types have been considered. These are as follows.

° Undeveloped Areas

These regional service areas contain no major existing development and generally occur around the outer edges of the ETJ. The plan for these areas include sanitary trunk corridors and plant locations based on above-mentioned criteria.

° Partially Developed Areas

These regional service areas include some developed acreage and in some cases utility districts which are exempted from the requirements of the regionalization plan. Sanitary facility locations therefore have only

been identified for undeveloped areas. However, for those utility districts that do not meet the exemption requirements, regional facility locations have been delineated within or adjacent to the district boundaries.

° Areas Comprised Mostly of Exempted Districts

Many of the regional service areas located in the northern and western portions of the ETJ contain a large number of utility districts which are exempted from the plan. Where practicable, regional service area boundaries were drawn such that all undeveloped properties could be served by regional facilities. However, in most cases the undeveloped parcels within the service area are landlocked by existing development or are too small to satisfy the above service area criteria. As such, no regional facilities were proposed. New developments within this type of regional service area are encouraged to obtain wastewater services from adjacent existing facilities, when possible.

° Areas Comprised Entirely of Exempted Districts

For areas where a high concentration of utility districts exists, regional service areas were created by combining those districts which are exempted from the plan. As such, no sanitary facilities are delineated for this type of regional service area.

A list of all the utility districts within the ETJ is included at the end of this summary. The list contains information of the district status (exempt or nonexempt) as well as the regional service area in which the district is located.

Public Involvement

Public input on the formation of the Service Area Plan, as presented in this Executive Summary, was actively solicited during three separate coordination meetings held in October 1988, January and April 1989, and at a public hearing held on August 31, 1989. Notice of the public hearing was published in The Houston Post and The Houston Chronicle on two consecutive Fridays, July 21 and 28, 1989. In addition, more than 650 copies of the draft executive summary and public hearing notice were distributed for public review.

At the August 31, 1989 hearing, five speakers presented verbal comments on the Plan. In addition, a total of 90 written comments was received during and after the commenting period. Many of the comments required no revisions to the Plan because the correspondent intended only to confirm the exempt status of an existing utility district. In other cases, comments were noted but no revisions were made to the Plan because the requests did not conform with the requirements of the resolution. Examples of the comments or requests which were not incorporated into the Plan include:

- ° Request to exempt a district which did not meet the requirements for exemption. In order to be exempted from the Plan, an entity must have its wastewater facilities in place or under construction, or have obtained financing for construction of such facilities.
- ° Request for regional facility layouts within those regional service areas consisting mostly of exempt districts. The exempt districts are encouraged but not required to participate in a regional system, therefore, any future regional systems in these areas will be planned and constructed on a voluntary basis.
- ° Request for designation of a regional service area for an area currently served by a single existing sewage treatment plant. This type of request was considered only when the existing treatment plant service area was larger than 2,000 acres.

Of the 95 comments, 38 required revision of the draft Plan. These modifications included changes to utility district status (exempt or nonexempt), utility district boundaries, regional service area boundaries, and facility layouts. To the extent possible, the revisions have incorporated new information received from the correspondents concerning recent or planned utility district annexations or existing regional systems serving more than one utility district or development. The developments served by a single existing regional system have been grouped within a single regional service area.

A breakdown of comments requiring revisions to the draft Plan is summarized below:

◦ Revision to ETJ boundary	1
◦ Change of district exemption status	11
◦ Revision to regional service area boundary	16
◦ Revision to district boundary	9
◦ Realignment of trunk sewer corridor	<u>1</u>
TOTAL	38

Plan Implementation

The Service Area Plan presented herein will initially be reviewed by the Director of Public Works and Engineering and ultimately recommended for approval by the City of Houston Planning Commission and adoption by the Houston City Council. The adopted plan may then be modified in accordance with the procedures outlined in Figure 1 either upon initiation of the Public Works and Engineering staff or upon request of a wastewater discharge applicant. The Planning Commission may grant a variance to the plan in those instances where strict compliance with the specific terms, rules, conditions, policies, standards, and boundaries of the Regionalization Plan would cause economic waste by requiring the abandonment of existing facilities or the construction of facilities which would duplicate the function of existing facilities. Such modifications shall be incorporated in the annual City Council review. Finally, the City Planning Commission shall revise the adopted Service Area Plan following annexations to reflect the expanded ETJ, subject to City Council approval. If all or part of an established Regional Service Area is annexed by the City, it shall continue to be subject to the Regionalization Plan, unless the area is shifted or removed from the Regional Service Area in accordance with the provisions of Resolution No. 88-81.

Finally, the review process outlined in Resolution No. 88-81 assures that public input on the Service Area Plan will be obtained at least annually. In scheduling such an annual review process, it should be recognized that minor

changes will be acted upon by the City Planning Commission on a monthly basis. Hence, the annual review process will essentially provide an opportunity to review and approve the changes made to the adopted Service Area Plan during the past year and to provide input regarding future direction. A public hearing will be conducted under the direction of the Planning Commission on an annual basis in preparation for submittal of a recommendation to the Houston City Council.

Finance Options

Since regionalization involves the development of large scale facilities, the initial investment to implement the above described plan could be greater than the initial investment for separate utility districts with small plants. Consequently, financing is considered to be a critical component in the development of regional wastewater treatment facilities within the City of Houston's ETJ. However, it is beyond the scope of this study to define specific financing mechanisms necessary to carry out the wastewater regionalization plan. Some effort has been made to identify potential financing options which may be considered by future development in the ETJ. These financing strategies were identified through coordination with various local, City, and State officials and research into similar planning efforts. The following provides insight into these potential financing strategies.

A possible vehicle for regionalization is the creation of a multiple district entity which could assess a property tax to invest in plant sites and oversized sewer construction. Future water districts and existing districts without facilities would automatically become components of this entity. As service demand increases, collected property tax revenues would be supplemented by the sale of plant sites, sewer capacity, and treatment capacity.

As such, property owners throughout the regionalized district would share in the risks and benefits associated with a regional wastewater treatment system. In addition to, or in place of the district property tax, the established regional district could also charge nonregional municipal plants that wish to participate in the plan a fee, based on the volume of their effluent discharge. Such a fee would be used to incorporate these existing facilities into the regional system.

A second possible financing strategy is to require the first individual utility district created within an established regional service area to acquire the regional plant site and build both the first module of the treatment plant and oversized sewers to reach the plant. Although the district would initially incur greater expenses, it would own considerable assets. Also, as other districts form and additional development occurs, the first district could recoup its costs by charging users fees. However, the tax rate that the first district might impose to finance the initial facility costs could adversely impact development. Even if the tax did not interfere with initial development, the landowners in the initial district would incur substantial risk that the remainder of the regional service area would not develop, or develop very slowly. As such, a large entity is much better suited to bear the risk of investing in a new regional system and of bearing the large initial costs. Hence, the City of Houston, which may annex individual districts into its ETJ, is a logical choice to participate in the initial development of a regional treatment system and, thus, represents another financing option. However, because of the recent downturn in the economy and the City's ongoing infrastructure rehabilitation and upgrading efforts, a diversion of City funds to a regionalization program is unlikely in the immediate future.

Whether one or a combination of the above financial strategies are adopted to attenuate the initial system costs, the long-term benefits associated with a regional system are anticipated to be substantial and eventually offset the up-front costs.

LIST OF UTILITY DISTRICTS WITHIN HOUSTON ETJ

Name of Utility District Located within Regional Service Area Boundary	Status *	District Acreage	Regional Service Area
ADDICKS UD	E	640	NW9B
ALDINE MUD	E	1,480	NE2E
ALDINE PUD	N	250	NE4E
BAKER ROAD MUD	N	60	SW9A
BAMMEL UD	E	330	NW3I
BARKER-CYPRESS MUD	E	400	NW8B & NW9D
BAYBROOK MUD 1	E	720	SE9J
BAYFIELD PUD	E	320	SE9J
BEAR CREEK UD	N	290	NW11C
BEAUMONT PLACE UD	N	390	NE8B
BEECHNUT MUD	E	430	SW8D
BELLFORT PUD	N	210	SW8E
BELTWAY 8 MUD 1	E	460	NE7F
BELTWAY 8 MUD 2	E	400	NE7F
BELTWAY 8 MUD 3	E	460	NE7F
BIG OAK MUD	E	180	SW8C
BILMA PUD	E	520	NW3J
BISSONET	E	430	SW8D
BRAES UD	E	300	SW8C
BRIAR RIDGE MUD	N	500	SW1G
BRIDGESTONE MUD	E	420	NW3J
CAMFIELD MUD	E	180	NW6D
CARPENTER'S BAYOU MUD	N	470	NE9C
CASTLEWOOD MUD	E	320	NW10A
CHARTERWOOD MUD	E	410	NW5H
CHELFORD CITY MUD	E	710	SW8D
CHELFORD ONE MUD	E	460	SW8D
CHIMNEY HILL MUD	E	400	NW6D
CIMARRON MUD	E	1,000	SW11A
CINCO MUD 1	E	310	SW11C
CINCO MUD 2	E	470	SW11C
CINCO MUD 3	E	250	SW11C
CINCO MUD 4	E	290	SW11C
CINCO MUD 5	E	400	SW11C
CINCO MUD 6	E	470	SW11C
CINCO MUD 7	E	530	SW11C
CINCO MUD 8	E	410	SW11C
CINCO MUD 9	E	500	SW11C
CINCO MUD 10	E	480	SW11C

* E - Exempt; N - Nonexempt

LIST OF UTILITY DISTRICTS WITHIN HOUSTON ETJ (Cont.)

Name of Utility District Located within Regional Service Area Boundary	Status *	District Acreage	Regional Service Area
CINCO MUD 11	E	200	SW11C
CINCO MUD 12	E	420	SW11C
CINCO MUD 13	E	320	SW11C
CINCO MUD 14	E	370	SW11C
CLAY ROAD MUD	E	300	NW9B
CNP UD	E	720	NW1I
CORNERSTONE MUD	E	580	SW11A
CROSBY MUD	E	620	NE11E
CY CHAMP PUD	E	490	NW4H
CYPRESS CREEK UD	E	480	NW6H
CYPRESS FOREST PUD	E	870	NW4H
CYPRESS HILL MUD 1	E	320	NW10H
CYPRESS HILL MUD 2	E	500	NW10H
CYPRESSKLEIN UD	E	510	NW3I
CYPRESSWOOD UD	E	560	NW2I
DOVE MEADOWS MUD	E	380	NW2K
DOWDELL PUD	E	300	NW4K
EAST MC MUD 2	N	410	NE7L
EL DORADO UD	E	340	NE6G
EMERALD FOREST UD	E	300	NW4F
ENCANTO REAL UD	E	360	NW3L
ENCHANTED VALLEY PUD	E	320	NW7G
FALLBROOK UD	E	530	NW1E
FAULKEY GULLY MUD	E	910	NW6H
FBC MUD 2	E	590	SW8D
FBC MUD 23	E	280	SW3J
FBC MUD 24	N	560	SW3J
FBC MUD 25	E	450	SW8F
FBC MUD 30	E	540	SW8D
FBC MUD 34	E	530	SW12C
FBC MUD 35	E	720	SW12C
FBC MUD 37	E	300	SW12B
FBC MUD 41	E	300	SW8F
FBC MUD 44	N	120	SW9D
FBC MUD 50	E	570	SW11D
FBC MUD 51	E	270	SW8F
FBC MUD 52	N	340	SW8F
FBC MUD 53	N	160	SW12B
FBC MUD 57	N	550	SW13C
FBC MUD 58	N	320	SW13C

* E - Exempt; N - Nonexempt

LIST OF UTILITY DISTRICTS WITHIN HOUSTON ETJ (Cont.)

Name of Utility District Located within Regional Service Area Boundary	Status *	District Acreage	Regional Service Area
FBC MUD 67	E	270	SW8F
FBC MUD 70	N	110	SW13C
FBC MUD 71	N	160	SW1H
FBC MUD 73	N	460	SW8F
FBC MUD 74	E	700	SW8F
FBC MUD 91	N	340	SW11D
FBC MUD 93	E	300	SW12C
FBC MUD 99	N	250	SW12C
FBC MUD 105	N	320	SW10D
FOREST COVE MUD	E	1,330	NE7J
FOREST HILLS MUD	E	460	NW1E
FOREST POINT MUD	E	390	NE4I
FOUNTAINHEAD MUD	E	480	NW3G
FRY ROAD MUD	E	380	NW10A
FWSD 6	E	380	NE11A
FWSD 47	E	400	NE11A
GLEN HOLLOW PUD	N	510	NE12K
GRAND MISSION MUD 1	N	540	SW10D
GRAND NORTHWEST MUD	E	530	NW11H
GRANT ROAD UD	E	300	NW6H
GREEN TRAILS MUD	E	250	SW9A
GREEN VALLEY MUD	N	210	NW3L
GREENS PARKWAY MUD	E	460	NE2G
GREENWOOD UD	E	360	NE8C
GULFWAY UD	E	390	SE9J
HANNA NASH PUD	N	170	NE11G
HC FWSD 45	E	200	NE2G
HC FWSD 51	E	620	NE9A
HC FWSD 52	E	1,000	NW3H
HC FWSD 58	E	830	NE11G
HC FWSD 61	E	1,500	NW7F
HC FWSD 64	E	480	NE2E
HC MUD 1	E	450	NW4L
HC MUD 2	N	250	NW4J
HC MUD 4	N	100	NE3E
HC MUD 5	E	440	NW2G
HC MUD 6	E	440	NW3D
HC MUD 8	E	460	NE9A
HC MUD 9	N	300	NW3L
HC MUD 13	E	220	SE7H

* E - Exempt; N - Nonexempt

LIST OF UTILITY DISTRICTS WITHIN HOUSTON ETJ (Cont.)

Name of Utility District Located within Regional Service Area Boundary	Status *	District Acreage	Regional Service Area
HC MUD 14	N	520	NW1F
HC MUD 16	E	240	NW3G
HC MUD 17	N	240	NE6F
HC MUD 18	E	600	NW6H
HC MUD 19	E	200	NE11E
HC MUD 20	E	1,400	NE11E
HC MUD 22	E	410	NW4L
HC MUD 23	E	420	NW3D
HC MUD 24	E	720	NW3I
HC MUD 25	E	100	NW4D
HC MUD 26	E	1,210	NE4I
HC MUD 29	E	280	NW9H
HC MUD 33	E	270	NW2F
HC MUD 35	E	270	NW4L
HC MUD 36	E	690	NE1H
HC MUD 37	N	180	NW6G
HC MUD 43	E	310	NE3J
HC MUD 44	E	300	NW3I
HC MUD 46	E	470	NE9H
HC MUD 48	E	650	NW3G
HC MUD 49	E	570	NE7F
HC MUD 52	E	120	NW4F
HC MUD 53	E	1,420	NE9A
HC MUD 54	N	370	NE1H
HC MUD 55	E	860	SE9J
HC MUD 58	N	80	NW2H
HC MUD 61	E	430	NW10A
HC MUD 62	E	420	NW10A
HC MUD 63	N	340	NW10A
HC MUD 64	E	550	NW10A
HC MUD 65	E	280	NW10A
HC MUD 67	E	590	SE8I
HC MUD 69	E	280	NW7F
HC MUD 70	E	540	NW9D
HC MUD 71	E	620	NW11B
HC MUD 73	E	470	NE11E
HC MUD 76	N	350	NW15I
HC MUD 77	N	290	NE4J
HC MUD 81	E	950	SW11A
HC MUD 82	E	1,000	NE2J

* E - Exempt; N - Nonexempt

LIST OF UTILITY DISTRICTS WITHIN HOUSTON ETJ (Cont.)

Name of Utility District Located within Regional Service Area Boundary	Status *	District Acreage	Regional Service Area
HC MUD 85	N	150	NE4I
HC MUD 86	E	370	NW1I
HC MUD 90	E	360	SW8C
HC MUD 91	N	270	NE12I
HC MUD 93	E	200	NE7J
HC MUD 96	N	370	NE2G
HC MUD 97	N	150	NW2J
HC MUD 101	N	350	NE2G
HC MUD 102	E	840	NW8C
HC MUD 104	E	240	NW2J
HC MUD 105	E	740	NW11C
HC MUD 106	N	490	NE8G
HC MUD 107	E	230	SW8C
HC MUD 109	E	1,070	NE7H & NE9H
HC MUD 112	N	550	NE11D
HC MUD 114	N	140	NW5K
HC MUD 115	N	160	NE1J
HC MUD 118	E	350	NW2D
HC MUD 119	E	720	NW2D
HC MUD 120	E	880	SW8D
HC MUD 126	E	210	NW3J
HC MUD 127	E	310	NW10C
HC MUD 130	E	740	NW6D
HC MUD 132	E	980	NE9H
HC MUD 136	E	420	NW8B
HC MUD 137	N	380	NW11B
HC MUD 144	E	360	NW9D
HC MUD 145	E	670	NE7J
HC MUD 147	E	220	SW8D
HC MUD 148	E	860	NE7D
HC MUD 149	E	360	NW8D
HC MUD 150	E	650	NW2G
HC MUD 151	E	850	NE9H
HC MUD 152	E	680	NE9H
HC MUD 153	E	960	NE9H
HC MUD 155	E	310	NW8D
HC MUD 156	E	290	NW8D
HC MUD 157	E	660	NW10C
HC MUD 158	E	430	SW8D
HC MUD 159	E	250	NW5H

* E - Exempt; N - Nonexempt

LIST OF UTILITY DISTRICTS WITHIN HOUSTON ETJ (Cont.)

Name of Utility District Located within Regional Service Area Boundary	Status *	District Acreage	Regional Service Area

HC MUD 162	E	410	NW8D
HC MUD 163	E	530	NW8D
HC MUD 165	E	430	NW10C
HC MUD 166	E	460	NW8C
HC MUD 167	E	540	NW11C
HC MUD 168	E	640	NW6D
HC MUD 169	N	180	NW6D
HC MUD 170	E	180	NW6D
HC MUD 171	N	390	NW11D
HC MUD 172	E	290	NW8D
HC MUD 173	E	300	NW8D
HC MUD 175	E	670	SW8C
HC MUD 177	N	100	SW8D
HC MUD 179	E	220	NW8D
HC MUD 180	E	500	NW2F
HC MUD 182	E	140	NE4E
HC MUD 183	E	310	NW8B
HC MUD 185	E	130	NW8C
HC MUD 186	E	400	NW8D
HC MUD 188	E	330	NW8D
HC MUD 189	E	490	NW1I
HC MUD 190	N	230	SW11A
HC MUD 191	E	150	NW5H
HC MUD 192	N	280	SE7H
HC MUD 194	E	150	NW8F
HC MUD 195	E	290	NW8F
HC MUD 196	E	190	NW8F
HC MUD 197	N	50	NW8C
HC MUD 199	E	100	NW6D
HC MUD 200	E	630	NW1I
HC MUD 202	E	360	NW3G
HC MUD 203	E	330	NW1F
HC MUD 205	E	140	NW1I
HC MUD 208	E	300	NW8D
HC MUD 211	E	300	NW3I
HC MUD 212	N	100	NE4F
HC MUD 215	E	130	NW1I
HC MUD 216	E	110	SW9A
HC MUD 217	E	200	NW2G
HC MUD 220	N	90	NW2D

* E - Exempt; N - Nonexempt

LIST OF UTILITY DISTRICTS WITHIN HOUSTON ETJ (Cont.)

Name of Utility District Located within Regional Service Area Boundary	Status *	District Acreage	Regional Service Area
HC MUD 221	E	450	NE1H
HC MUD 222	E	520	NW6D
HC MUD 223	E	370	SW8C
HC MUD 225	E	390	NW10C
HC MUD 229	E	90	NW4F
HC MUD 230	E	430	NW5H
HC MUD 231	E	450	**
HC MUD 233	E	160	NW3I
HC MUD 236	E	440	NE7J
HC MUD 237	E	280	NW4F
HC MUD 238	E	460	NW9B
HC MUD 239	E	470	NW10C
HC MUD 240	E	370	NW10C
HC MUD 243	N	170	SW8D
HC MUD 246	N	80	SW8D
HC MUD 247	E	190	NW6D
HC MUD 248	E	290	NW7F
HC MUD 249	E	480	NE1J
HC MUD 250	E	130	NW8C
HC MUD 252	N	110	NW9B
HC MUD 254	E	250	NW5H
HC MUD 255	N	160	NW6C
HC MUD 256	E	170	NW8B
HC MUD 257	E	350	NW8C
HC MUD 259	N	110	NW6D
HC MUD 261	N	170	NW3D
HC MUD 262	N	560	NE7J
HC MUD 263	N	350	NW11B
HC MUD 264	E	340	NW9D
HC MUD 265	N	310	NW3J
HC MUD 266	E	260	NE4F
HC MUD 268	N	300	NW11C
HC MUD 271	N	300	NE2G
HC MUD 272	E	160	NW11C
HC MUD 273	E	170	NW7H
HC MUD 274	N	270	NE2G
HC MUD 275	E	550	NW2I
HC MUD 276	E	320	NW8C
HC MUD 277	E	530	NW9D
HC MUD 278	E	280	NE9H

**Currently served by Metro Plant
at Intercontinental Airport.

* E - Exempt; N - Nonexempt

LIST OF UTILITY DISTRICTS WITHIN HOUSTON ETJ (Cont.)

Name of Utility District Located within Regional Service Area Boundary	Status *	District Acreage	Regional Service Area
HC MUD 279	E	290	NW2G
HC MUD 280	E	390	NW7H
HC MUD 281	E	250	NW7H
HC MUD 282	E	360	NW7H
HC MUD 283	E	310	NW7H
HC MUD 284	E	340	NW9B
HC MUD 285	E	430	NE9A
HC MUD 286	E	330	NW6H
HC MUD 287	N	370	NW12A
HC MUD 288	N	260	NW12A
HC MUD 289	N	240	NW9H
HC MUD 290	N	560	NE8G
HC MUD 291	N	320	NE8G
HC MUD 292	N	290	NE8G
HC MUD 304	E	330	NW2G
HC MUD 306	N	130	NW10A
HC MUD 309	N	460	NW5K
HC MUD 311	N	230	NW1L
HC MUD 316	N	360	NW3I
HC MUD 317	N	170	NW12I
HC MUD 318	N	210	NW12I
HC MUD 319	N	240	NW12I
HC MUD 321	E	620	NW1E
HC MUD 322	E	350	NW11H
HC MUD 324	E	170	NW9D
HC MUD 325	N	370	NW6G
HC MUD 328	N	310	NW13H
HC MUD 329	N	250	NW13H
HC MUD 330	N	340	NW13H
HC MUD 334	N	140	NW11A
HC MUD 341	E	330	NW6C
HC MUD 342	E	290	NE7F
HC MUD 343	E	360	NE7F
HC MUD 344	E	320	NE7F
HC MUD 350	E	500	NE7J
HC MUD 351	E	190	NW4E
HC UD 1	E	570	NE7J
HC UD 2	E	620	NE7J
HC UD 3	E	520	NE7J
HC UD 4	E	530	NE7J

* E - Exempt; N - Nonexempt

LIST OF UTILITY DISTRICTS WITHIN HOUSTON ETJ (Cont.)

Name of Utility District Located within Regional Service Area Boundary	Status *	District Acreage	Regional Service Area
HC UD 5	E	260	NE7J
HC UD 6	E	530	NW8B
HC UD 8	E	1,060	NE7J
HC UD 10	E	770	NE7J
HC UD 14	E	470	NW2F
HC UD 15	E	510	NW2F
HC UD 16	E	330	NE1H
HC WCID 21	E	2,080	NE1A
HC WCID 36	E	1,300	NE9A
HC WCID 70	E	1,030	NE11F
HC WCID 74	E	380	NE4D
HC WCID 76	E	320	NE5E
HC WCID 84	E	720	NE1A
HC WCID 86	N	1,520	NW1L
HC WCID 87	N	400	NE12J
HC WCID 89	E	530	SE2G
HC WCID 91	E	340	NW2I
HC WCID 92	E	620	NE2J
HC WCID 96	N	2,050	NE6F
HC WCID 99	E	410	NE1J
HC WCID 109	E	690	NW3G
HC WCID 110	E	670	NW2J
HC WCID 113	E	260	NW7G
HC WCID 114	E	690	NW4H
HC WCID 116	E	370	NW3H
HC WCID 119	E	480	NW4H
HC WCID 132	E	330	NW2I
HC WCID 133	E	500	NW2E
HC WCID 136	E	310	NE3J
HC WCID 155	E	1,360	NW11H
HEATHERLOCH MUD OF HC	E	260	NW3H
HORSEPEN BAYOU MUD	E	650	NW6C
HUFFSMITH RD PUD	N	220	NW5M
HUNTERWOOD MUD	E	310	NE8B
HUNTER'S GLEN MUD	E	580	NE4I
H-FBC MUD 1	E	340	SW11A
H-FBC MUD 3	N	170	SW12B
H-FBC MUD 4	N	400	SW12B
H-FBC MUD 5	N	340	SW12B
INTERSTATE MUD	E	270	SW11A

* E - Exempt; N - Nonexempt

LIST OF UTILITY DISTRICTS WITHIN HOUSTON ETJ (Cont.)

Name of Utility District Located within Regional Service Area Boundary	Status *	District Acreage	Regional Service Area
INTERWOOD MUD	E	330	NE4F
INVERNESS FOREST ID	E	670	NE2I
JACKRABBITT ROAD PUD	E	440	NW8B
KINGSBRIDGE MUD	E	690	SW8D
KIRKMONT MUD	E	260	SE7H
KLEIN PUD	E	590	NW2I
KLEINWOOD MUD	E	550	NW4H
KUYKENDAHL ROAD PUD 1	N	300	NW5M
KUYKENDAHL ROAD PUD 2	N	660	NW5M
LAKE FOREST UD	E	590	NW6H
LANGHAM CREEK UD	E	850	NW9D
LIBERTY PUD	N	590	NE12K
LONGHORN TOWN UD	E	170	SW9A
LOUETTA NORTH PUD	E	270	NW4H
LOUETTA ROAD UD	E	240	NW3I
LUCE BAYOU PUD	E	480	NE11K
MALCOMSON ROAD UD	E	550	NW6H
MASON CREEK UD	E	910	SW9A & SW11A
MAY PUD	N	980	NE12K
MAYDE CREEK MUD	E	480	NW9B
MC MUD 6	E	1,620	NW2M
MC MUD 7	E	840	NW2M
MC MUD 19	E	260	NW2M
MC MUD 24	E	290	NE7L
MC MUD 25	N	260	NW1L
MC MUD 36	N	860	NW2M
MC MUD 40	E	670	NW2M
MC MUD 46	E	340	NW2M
MC MUD 47	E	790	NW2M & NW30
MC MUD 48	E	670	NE7J
MC MUD 58	E	160	NE7J
MC MUD 60	E	840	NW2M & NW30
MC MUD 63	E	110	NW2M
MC MUD 69	N	500	NE3K
MC MUD 70	N	270	NE3K
MC MUD 71	N	410	NE3K
MC MUD 72	N	740	NE3K
MC MUD 73	N	390	NE3K
MC MUD 74	N	470	NE3K
MC WCID 1	E	1,000	NW2M

* E - Exempt; N - Nonexempt

LIST OF UTILITY DISTRICTS WITHIN HOUSTON ETJ (Cont.)

Name of Utility District Located within Regional Service Area Boundary	Status *	District Acreage	Regional Service Area
MEMORIAL HILLS UD	E	450	NE2I
MEMORIAL MUD	E	540	SW11A
MILLS RD MUD	E	390	NW4F
MISSION BEND MUD 1	E	690	SW8D
MISSION BEND MUD 2	E	720	SW8D
MORTON ROAD MUD	E	270	NW10A
MOSSEY OAKS UD	N	150	NE3I
MOUNT HOUSTON ROAD MUD	E	510	NW1E
NE HC MUD 1	N	320	NE9C
NEW CANEY MUD	E	8,820	NE8M
NHC MUD 1	N	330	NE6G
NORTH BELT UD	E	280	NE4F
NORTH FOREST MUD	E	160	NW1I
NORTH GREEN MUD	E	460	NE2G
NORTH MISSION GLEN MUD	E	370	SW8D
NORTH PARK MUD	E	280	NE1H
NORTHAMPTON MUD	E	840	NW4L
NORTHGATE CROSSING MUD 1	E	340	NE1K
NORTHGATE CROSSING MUD 2	E	190	NE1K
NORTHGATE CROSSING MUD 3	E	230	NE1K
NORTHWAY MUD	E	360	NE2G
NORTHWEST FREEWAY MUD	E	570	NW12I
NOTTINGHAM COUNTRY MUD	E	640	SW9A
NW HC MUD 5	E	210	NW7I
NW HC MUD 6	E	340	NW3G
NW HC MUD 9	E	520	NW6G
NW HC MUD 10	E	220	NW9H
NW HC MUD 11	E	270	NW6J
NW HC MUD 12	E	360	NW11C
NW HC MUD 13	N	400	NW7G
NW HC MUD 15	E	420	NW7H
NW HC MUD 16	E	170	NW8C
NW HC MUD 19	E	670	NW4L
NW HC MUD 20	E	270	NW3G
NW HC MUD 21	E	190	NW3G
NW HC MUD 22	E	290	NW3G
NW HC MUD 23	E	330	NW3G
NW HC MUD 24	E	400	NW3G
NW HC MUD 25	E	150	NW5C
NW HC MUD 26	N	190	NW3L

* E - Exempt; N - Nonexempt

LIST OF UTILITY DISTRICTS WITHIN HOUSTON ETJ (Cont.)

Name of Utility District Located within Regional Service Area Boundary	Status *	District Acreage	Regional Service Area
NW HC MUD 27	E	90	NW7F
NW HC MUD 28	E	200	NW3J
NW HC MUD 29	E	140	NW6D
NW HC MUD 30	E	390	NW3J
NW HC MUD 31	E	270	NW3J
NW HC MUD 32	E	230	NW3J
NW HC MUD 36	E	130	NW3J
NW HC MUD 37	E	90	SW11A
NW PARK MUD	E	1,330	NW2E
OAKMONT PUD	E	500	NW4L
PARK TEN MUD	E	980	SW9A
PARKWAY UD	E	600	NE8C
PECAN GROVE MUD	E	310**	SW11F
PECAN PARK MUD	N	150	NW5C
PINE BOUGH PUD	E	740	NE11K
PINE FOREST MUD	N	380	NE1H
PINE FOREST PUD	N	450	NE12K
PINE VALLEY PUD	N	340	NE5E
PONDEROSA FOREST PUD	E	670	NW2I
PORTER MUD	E	2,790	NE7L
POST OAK ROAD MUD	E	340	SW3H
POST WOOD MUD	E	350	NE3J
PRESTONWOOD FOREST UD	E	490	NW5H
RANKIN ROAD WEST MUD	E	350	NW2G
RAYFORD ROAD MUD	E	990	NE1M
REID ROAD MUD 1	E	540	NW6E
REID ROAD MUD 2	E	570	NW6E
REMINGTON MUD 1	E	150	NW8F
REMINGTON MUD 2	N	270	NW8F
REMINGTON MUD 3	N	520	NW8F
RENN ROAD	E	290	SW8D
RHEA UD	N	610	NE12K
RICEWOOD MUD	E	530	NW9B
RICHEY RD MUD	E	400	NE2I
RIVER CLUB ESTATE MUD	E	290	NE7J
ROBIN PUD	N	190	NE12J
ROLLING CREEK UD	E	570	NW9B
ROLLING FORK PUD	E	310	NW3D
ROYALWOOD MUD	E	200	NE8B
SAGE MEADOW UD	E	520	SE7H

* E - Exempt; N - Nonexempt

**Acreage includes portion of Pecan Grove within the ETJ.

LIST OF UTILITY DISTRICTS WITHIN HOUSTON ETJ (Cont.)

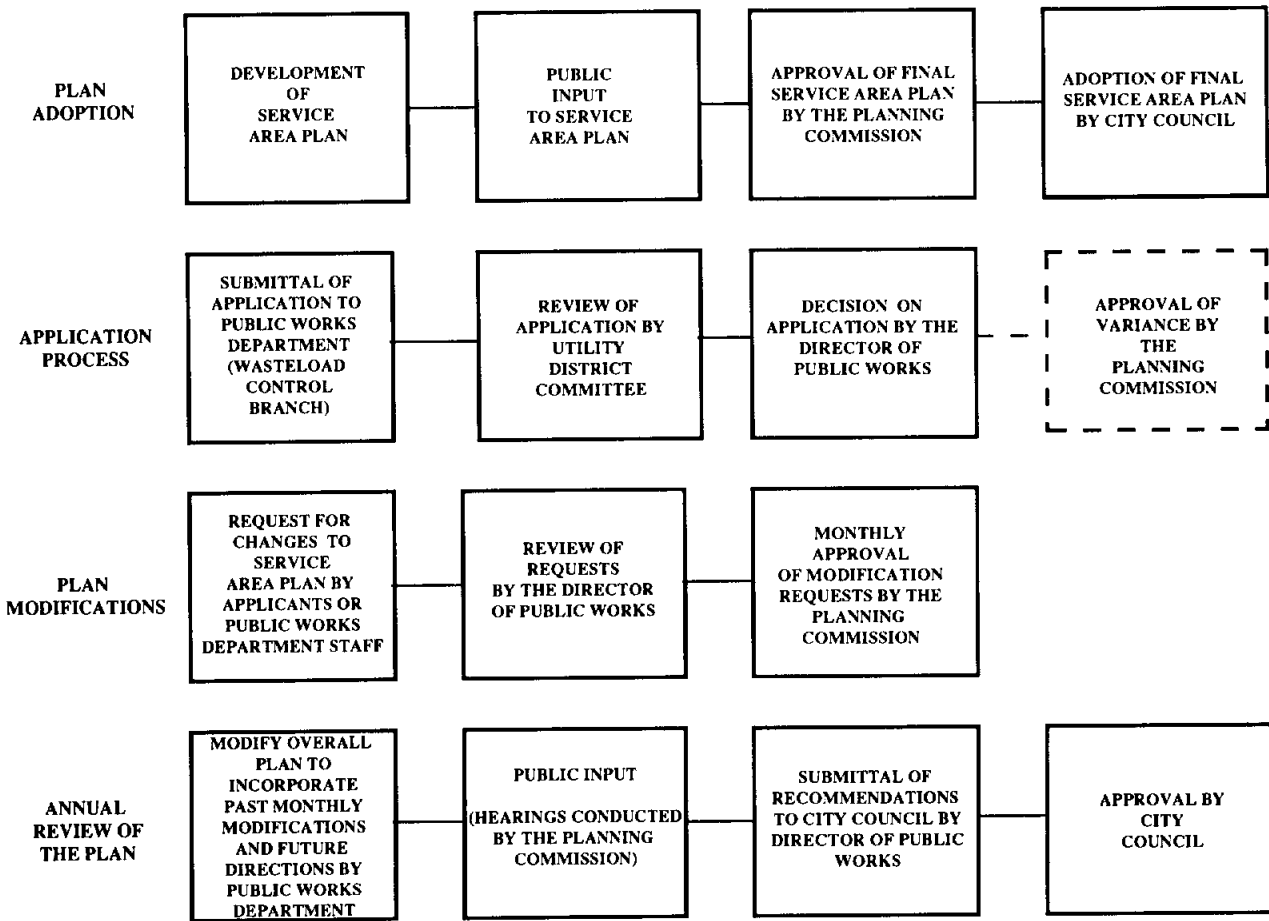
Name of Utility District Located within Regional Service Area Boundary	Status *	District Acreage	Regional Service Area
SEQUOIA MUD	E	180	NE4F
SHASLA PUD	E	220	NW2K
SHELDON ROAD MUD	E	790	NE9D
SKY LAKES ID	E	490	NW16H
SOUTH MISSION GLEN MUD	E	170	SW8D
SOUTHBEND MUD	E	510	SE7H
SOUTHERN MC MUD	E	1,970	NE1M
SPANISH COVE PUD	E	210	NE11G
SPENCER ROAD PUD	E	740	NW6D
SPRING CREEK FOREST PUD	E	360	NW3I
SPRING CREEK UD	E	520	NE1M
SPRING CYPRESS RD MUD	N	150	NW8G
SPRING PUD	N	190	NE1J
SPRING WEST MUD	E	370	NW1L
TATTOR ROAD MUD	E	750	NE3J
TERRANOVA WEST MUD	E	320	NW3I
THE WOODLANDS MUD 2	E	1,010	NW2M
THREE LAKES MUD 1	E	600	NW6J
TIDWELL TIMBERS MUD 3	E	350	NE8C
TIMBER LANE UD	E	1,000	NE3J
TIMBERLAKE ID	E	350	NW7G
TOWER OAKS PLAZA MUD	E	180	NW6G
TRAIL OF THE LAKES MUD	E	610	NE9H
VIA RANCH MUD 1	E	390	SW12C
VIA RANCH MUD 2	E	410	SW12C
VIA RANCH MUD 3	E	390	SW12C
VIA RANCH MUD 4	E	280	SW12C
W HC MUD 1	E	440	NW4D
W HC MUD 2	E	430	NW10A
W HC MUD 4	E	250	SW8D
W HC MUD 5	N	290	NW10A
W HC MUD 6	E	90	SW8C
W HC MUD 7	E	440	NW10A
W HC MUD 8	E	330	NW6E
W HC MUD 9	E	470	NW6E
W HC MUD 10	E	560	NW6E
W HC MUD 11	E	740	NE6E
W HC MUD 14	E	390	NW8D
W HC MUD 15	E	390	NW8D
W HC MUD 16	E	50	SW8C

* E - Exempt; N - Nonexempt

LIST OF UTILITY DISTRICTS WITHIN HOUSTON ETJ (Cont.)

Name of Utility District Located within Regional Service Area Boundary	Status *	District Acreage	Regional Service Area
W HC MUD 17	E	160	NW10A
W HC MUD 18	E	260	SW8C
W HC MUD 20	E	250	NW8F
W HC MUD 21	E	600	NW4E
WCID 132	E	330	NW2I
WEST LAKE MUD 1	E	390	NW10A
WEST MEMORIAL MUD	E	440	SW11A
WEST PARK MUD	E	400	SW9A
WESTADOR MUD	E	380	NW2I
WESTGREEN POINT MUD	N	80	NW11A
WESTON MUD	E	720	NW10A
WESTWAY UD	E	880	NW5C
WHITE OAK BEND MUD	E	120	NW6E
WHITE OAK/1960 MUD	N	130	NW6D
WILLOW CHASE MUD	E	220	NW5H
WILLOW POINT MUD	E	240	SW14A
WINDFERN FOREST UD	E	380	NW4D
WOOD BEND MUD	N	620	NE8B
WOODCREEK MUD	E	330	NE2I
WOODLANDS METRO CENTER MUD	E	470	NW2M
WOOD-FOREST NORTH UD	N	460	NE8B

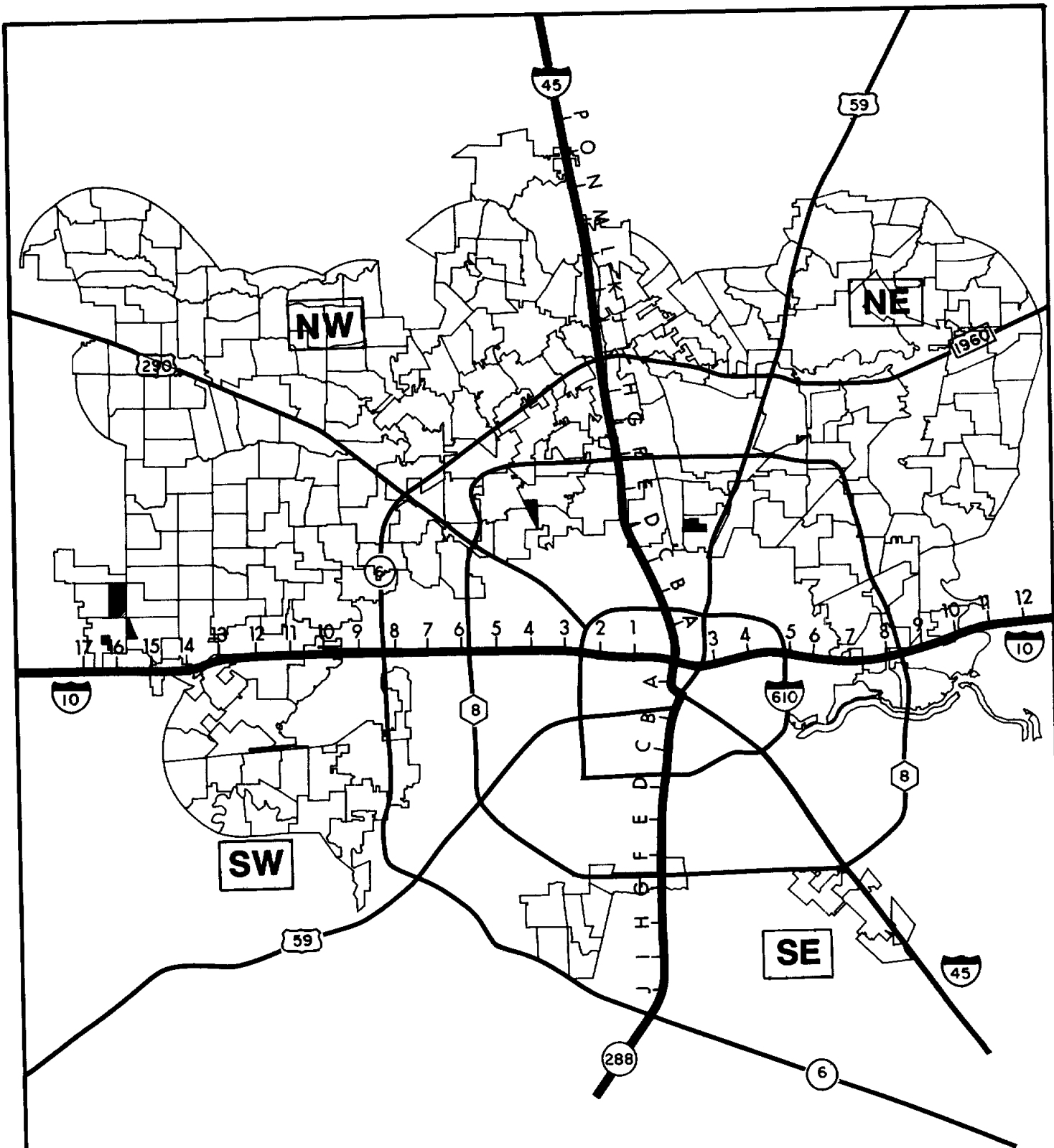
* E - Exempt; N - Nonexempt



**CITY OF HOUSTON
REGIONAL WASTEWATER PLAN**

OVERVIEW OF IMPLEMENTATION PLAN

Turner Collie & Braden Inc.
ENGINEERS • PLANNERS



LEGEND
 SERVICE AREA BOUNDARY

3 2 1
 EAST WEST GRID

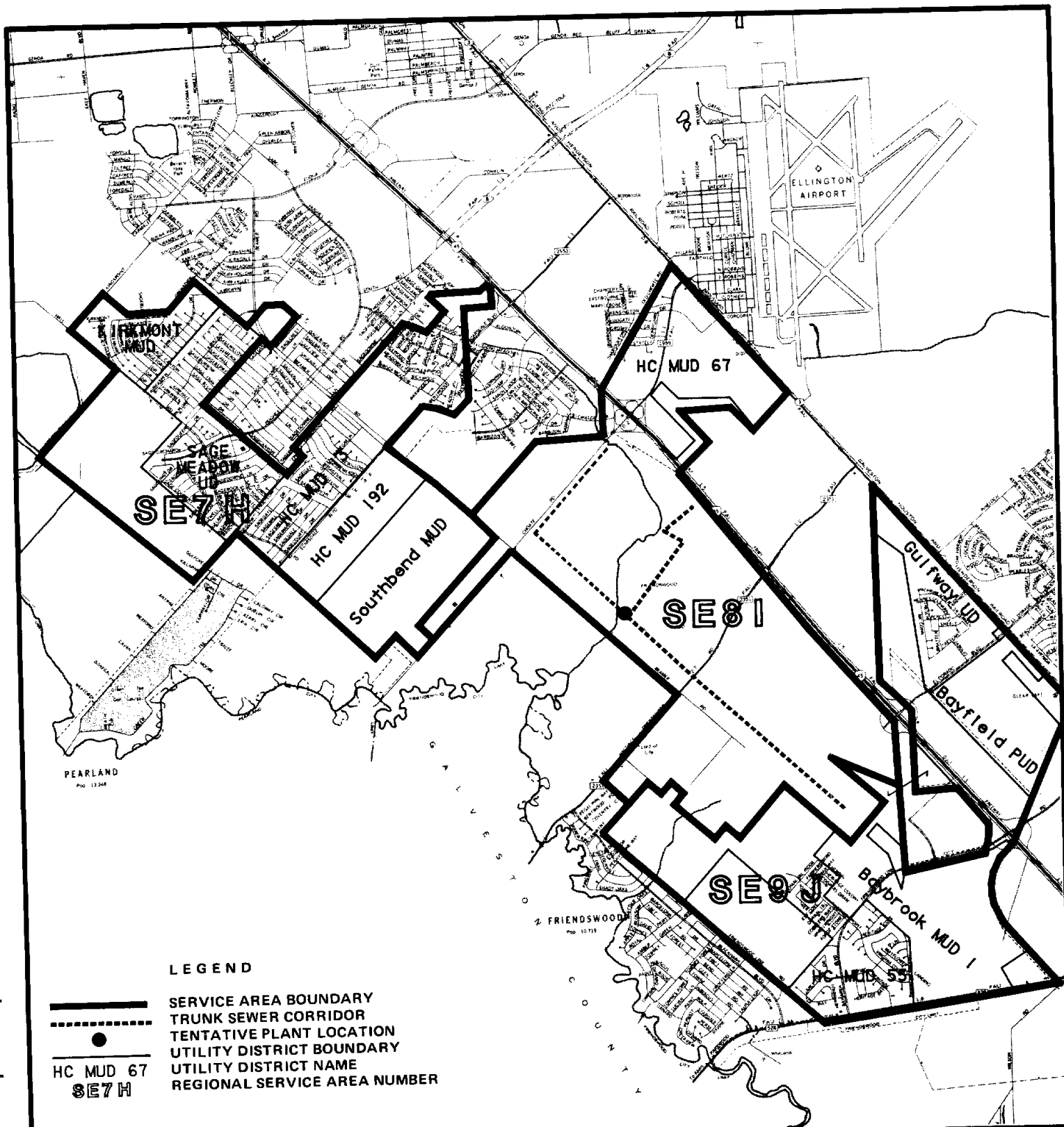
A
 B
 C
 NORTH SOUTH GRID

NW QUADRANT DESIGNATION







CITY OF HOUSTON
 REGIONAL WASTEWATER PLAN

GRID FOR REGIONAL SERVICE AREA
 NUMBERING SYSTEM

Turner Collie & Braden Inc.
 ENGINEERS • PLANNERS



LEGEND

-  SERVICE AREA BOUNDARY
-  TRUNK SEWER CORRIDOR
-  TENTATIVE PLANT LOCATION
-  UTILITY DISTRICT BOUNDARY
-  UTILITY DISTRICT NAME
-  REGIONAL SERVICE AREA NUMBER



<p>CITY OF HOUSTON REGIONAL WASTEWATER PLAN</p>		
<p>SERVICE AREA BOUNDARIES, TREATMENT PLANT LOCATIONS AND TRUNK SEWER CORRIDORS</p>		
<p>Turner Collie & Braden Inc. ENGINEERS • PLANNERS</p>		
Exhibit	8	Job No. 11-00232-001
		Date OCTOBER 1989

SOURCE: SDHPT, COUNTY HIGHWAY MAPS

A Regional Wastewater Facility Plan For The
City Of Houston Extraterritorial Jurisdiction
Executive Summary
Contract No. 8-483-630

The following maps are not attached to this report. They are located in the official file and may be copied upon request.

Map 1 Service area boundaries, treatment plant locations and trunk sewer corridors -

Exhibits 2-8

Map 2 Exhibit 3 Job No. 11-00232-001

Map 3 Exhibit 4 Job No 11-00232-002

Map 4 Exhibit 5 Job No. 11-00232-001

Map 5 Exhibit 6 Job No. 11-00232-001

Map 6 Exhibit 7 Job No. 11-00232-001

Please contact Research and Planning Fund
Grants Management Division at (512) 463-7926
for copies.
